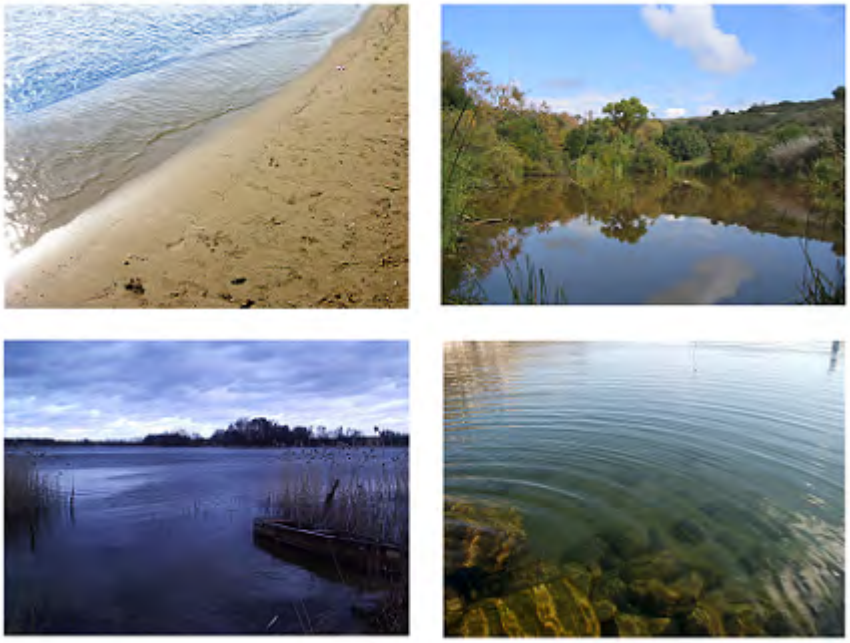
PRELIMINARY DRAINAGE STUDY



NEWLAND SIERRA
PDS 2014 MPA-14-018
VOLUME 2 – FEBRUARY 2017

Prepared For: Newland Sierra

Prepared By: Kenneth T. Kozlik

Job Number: 02660.002.02

FUSCOE ENGINEERING

full circle thinking

APPENDIX A

AES

Rational Method Hydrology

Existing Condition

BASIN A

FUSCOE
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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR01

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
102	101.8	2	1,225.0	1,205.0	75.0	0.35	0.32	Initial Runoff
101.8	101.6	5	1,205.0	1,135.0	300.0			Channel Flow
101.8	101.6	8				0.35	2.16	Add Area
101.6	101.4	5	1,135.0	1,020.0	600.0			
101.6	101.4	8				0.35	7.7	
101.4	101	5	1,020.0	860.0	740.0			
101.4	101	8				0.32	6.99	
101	100	5	860.0	575.0	1,640.0			
101	100	8				0.26	54.7	
100	1	4	555.4	504.8	444.0			Pipe flow
							71.87	Total Area

```
**************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
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           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN 1 - NO DETENTION ROUTING                                       *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR01.DAT
  TIME/DATE OF STUDY: 08:56 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ======= ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    101.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1225.00
  DOWNSTREAM ELEVATION(FEET) =   1205.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.98
 TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      0.98

****************************************************************************
 FLOW PROCESS FROM NODE    101.80 TO NODE    101.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1205.00  DOWNSTREAM(FEET) =   1135.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2333
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1744 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.98
 FLOW VELOCITY(FEET/SEC) =   2.34 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.14   Tc(MIN.) =   7.56
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    101.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    101.80 TO NODE    101.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.060
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     2.16   SUBAREA RUNOFF(CFS) =     5.34
 TOTAL AREA(ACRES) =      2.48   TOTAL RUNOFF(CFS) =    6.13
 TC(MIN.) =   7.56

****************************************************************************
 FLOW PROCESS FROM NODE    101.60 TO NODE    101.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =   1020.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1917
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1558 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.13
 FLOW VELOCITY(FEET/SEC) =   4.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.47   Tc(MIN.) =  10.04
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    101.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    101.60 TO NODE    101.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.883
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     7.70   SUBAREA RUNOFF(CFS) =    15.85
 TOTAL AREA(ACRES) =     10.18   TOTAL RUNOFF(CFS) =   20.96
 TC(MIN.) =  10.04
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    101.40 TO NODE    101.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1020.00  DOWNSTREAM(FEET) =    860.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   740.00   CHANNEL SLOPE =  0.2162
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1681 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     20.96
 FLOW VELOCITY(FEET/SEC) =   6.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =  11.99
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    101.00 =  1715.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    101.40 TO NODE    101.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.246
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3378
 SUBAREA AREA(ACRES) =    6.99   SUBAREA RUNOFF(CFS) =   11.73
 TOTAL AREA(ACRES) =     17.17   TOTAL RUNOFF(CFS) =   30.43
 TC(MIN.) =  11.99

**************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    575.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1640.00   CHANNEL SLOPE =  0.1738
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1469 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     30.43
 FLOW VELOCITY(FEET/SEC) =   6.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.08   Tc(MIN.) =  16.07
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    100.00 =  3355.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.342
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2786
 SUBAREA AREA(ACRES) =   54.70   SUBAREA RUNOFF(CFS) =   61.76
 TOTAL AREA(ACRES) =     71.87   TOTAL RUNOFF(CFS) =   86.94
 TC(MIN.) =  16.07

**************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE      1.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   555.40  DOWNSTREAM(FEET) =   504.80
  FLOW LENGTH(FEET) =   444.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.06
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     86.94
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =  16.48
  LONGEST FLOWPATH FROM NODE    102.00 TO NODE      1.00 =  3799.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     71.87  TC(MIN.) =     16.48
  PEAK FLOW RATE(CFS)   =     86.94
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS

```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/28/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 16 MIN.
6 H RAINFALL 3.5 INCHES
BA REA 71.87 ACRES
RUNOFF COEFFICIENT 0.28
PEAK DISCHARGE 86.94 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 16	DISCHARGE (CFS) = 4.2
TIME (MIN) = 32	DISCHARGE (CFS) = 4.4
TIME (MIN) = 48	DISCHARGE (CFS) = 4.6
TIME (MIN) = 64	DISCHARGE (CFS) = 4.9
TIME (MIN) = 80	DISCHARGE (CFS) = 5.1
TIME (MIN) = 96	DISCHARGE (CFS) = 5.5
TIME (MIN) = 112	DISCHARGE (CFS) = 5.8
TIME (MIN) = 128	DISCHARGE (CFS) = 6.4
TIME (MIN) = 144	DISCHARGE (CFS) = 6.8
TIME (MIN) = 160	DISCHARGE (CFS) = 7.8
TIME (MIN) = 176	DISCHARGE (CFS) = 8.5
TIME (MIN) = 192	DISCHARGE (CFS) = 10.4
TIME (MIN) = 208	DISCHARGE (CFS) = 11.8
TIME (MIN) = 224	DISCHARGE (CFS) = 17.4
TIME (MIN) = 240	DISCHARGE (CFS) = 25.1
TIME (MIN) = 256	DISCHARGE (CFS) = 86.94
TIME (MIN) = 272	DISCHARGE (CFS) = 13.9
TIME (MIN) = 288	DISCHARGE (CFS) = 9.3
TIME (MIN) = 304	DISCHARGE (CFS) = 7.3
TIME (MIN) = 320	DISCHARGE (CFS) = 6.1
TIME (MIN) = 336	DISCHARGE (CFS) = 5.3
TIME (MIN) = 352	DISCHARGE (CFS) = 4.7
TIME (MIN) = 368	DISCHARGE (CFS) = 4.3
TIME (MIN) = 384	DISCHARGE (CFS) = 0

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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR02

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments
202	201.5	2	765.0	740.0	75.0	0.25	0.27	Initial Runnoff
201.5	201	5	740.0	600.0	450.0			Channel Flow
201.5	201	8				0.49	4.18	Add Area
201	200	5	600.0	590.0	280.0			
201	200	8				0.28	8.71	
200	2	4	574.4	515.4	480.0			30" CSP Caltrans Pipe
							13.16	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC.
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 2                                                           *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR02.DAT
  TIME/DATE OF STUDY: 16:30 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    201.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    765.00
  DOWNSTREAM ELEVATION(FEET) =    740.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
 SUBAREA RUNOFF(CFS) =      0.54
 TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.54

****************************************************************************
 FLOW PROCESS FROM NODE    201.50 TO NODE    201.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    600.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.4667
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2217 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.54
 FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   8.05
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    201.00 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    201.50 TO NODE    201.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.784
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4754
 SUBAREA AREA(ACRES) =    4.18   SUBAREA RUNOFF(CFS) =   13.90
 TOTAL AREA(ACRES) =      4.45   TOTAL RUNOFF(CFS) =   14.35
 TC(MIN.) =   8.05

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    200.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    600.00  DOWNSTREAM(FEET) =    590.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE =  0.0357
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0357 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     14.35
 FLOW VELOCITY(FEET/SEC) =   2.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   9.86
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =   655.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    200.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.950
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3461
 SUBAREA AREA(ACRES) =    8.71   SUBAREA RUNOFF(CFS) =   14.51
 TOTAL AREA(ACRES) =     13.16   TOTAL RUNOFF(CFS) =   27.10
 TC(MIN.) =   9.86
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE      2.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   574.40  DOWNSTREAM(FEET) =   515.40
  FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.89
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     27.10
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =  10.44
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE      2.00 =  1135.00 FEET.
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     13.16  TC(MIN.) =     10.44
  PEAK FLOW RATE(CFS)   =     27.10
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR 03

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
350.2	350.1	2	1,385.0	1,373.0	55.0	0.35	0.05	
350.1	350	5	1,373.0	888.0	1,718.1			
350.1	350	8				0.27	19.21	
350	350	1						1 of 2, con 1
351.4	351.3	2	1,585.0	1,538.0	85.0	0.35	0.08	
351.3	351.2	5	1,538.0	1,190.0	1,021.0			
351.3	351.2	8				0.35	8.07	
351.2	351.1	5	1,190.0	1,005.0	817.0			
351.2	351.1	8				0.30	17.76	
351.1	350	5	1,005.0	888.0	495.0			
351.1	350	8				0.25	5.68	
350	350	1						2 of 2, con 2
350	340	5	888.0	851.0	395.0			
350	340	8				0.25	11.88	
340	330	5	851.0	814.0	545.0			
340	330	8				0.25	6.57	
330	330	1						1 of 3, con 2
331.2	331.1	2	1,622.0	1,585.0	87.0	0.35	0.16	
331.1	330	5	1,585.0	814.0	2,844.0			
331.1	330	8				0.31	42.74	
330	330	1						2 of 3, con 2
332.3	332.2	2	1,375.0	1,368.0	96.8	0.35	0.06	
332.2	332.2	5	1,368.0	980.0	1,350.1			
332.2	332.1	8				0.35	17.65	
332.1	330	5	980.0	814.0	1,361.0			
332.1	330	8				0.35	13.94	
330	330	1						3 of 3, con 2
330	320	5	814.0	600.0	871.0			
330	320	8				0.28	38.87	
320	310	4	600.0	537.0	500.0			Ex. 84" SSPP Caltrans
320	310	8				0.26	16.93	84" SSPP
310	3	4	537.0	522.0	630.0			Ex. 84" SSPP Caltrans
								Storm Drain System
							199.65	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

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                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 3                                                           *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR03.DAT
  TIME/DATE OF STUDY: 11:18 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    350.20 TO NODE    350.10 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    55.00
  UPSTREAM ELEVATION(FEET) =   1385.00
  DOWNSTREAM ELEVATION(FEET) =   1373.00
  ELEVATION DIFFERENCE(FEET) =     12.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.647
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.16
TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
FLOW PROCESS FROM NODE    350.10 TO NODE    350.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1373.00  DOWNSTREAM(FEET) =    888.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1718.10   CHANNEL SLOPE =  0.2823
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1906 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.16
FLOW VELOCITY(FEET/SEC) =   2.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =  11.71   Tc(MIN.) =  16.36
LONGEST FLOWPATH FROM NODE    350.20 TO NODE    350.00 =  1773.10 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    350.00 TO NODE    350.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.293
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2702
SUBAREA AREA(ACRES) =   19.21   SUBAREA RUNOFF(CFS) =   22.27
TOTAL AREA(ACRES) =     19.26   TOTAL RUNOFF(CFS) =   22.34
TC(MIN.) =  16.36

****************************************************************************
FLOW PROCESS FROM NODE    350.00 TO NODE    350.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  16.36
RAINFALL INTENSITY(INCH/HR) =   4.29
TOTAL STREAM AREA(ACRES) =    19.26
PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.34

****************************************************************************
FLOW PROCESS FROM NODE    351.40 TO NODE    351.30 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =   0
INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
UPSTREAM ELEVATION(FEET) =   1585.00
DOWNSTREAM ELEVATION(FEET) =   1538.00
ELEVATION DIFFERENCE(FEET) =     47.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.401
SUBAREA RUNOFF(CFS) =      0.24
```

```
 TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
 FLOW PROCESS FROM NODE    351.30 TO NODE    351.20 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1538.00  DOWNSTREAM(FEET) =   1190.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1021.00   CHANNEL SLOPE =  0.3408
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2036 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.24
 FLOW VELOCITY(FEET/SEC) =   2.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.73   Tc(MIN.) =  12.51
 LONGEST FLOWPATH FROM NODE    351.40 TO NODE    351.20 =  1106.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    351.20 TO NODE    351.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.104
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    8.07   SUBAREA RUNOFF(CFS) =   14.42
 TOTAL AREA(ACRES) =      8.15   TOTAL RUNOFF(CFS) =   14.56
 TC(MIN.) =  12.51

****************************************************************************
 FLOW PROCESS FROM NODE    351.20 TO NODE    351.10 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1190.00  DOWNSTREAM(FEET) =   1005.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   817.00   CHANNEL SLOPE =  0.2264
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1721 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     14.56
 FLOW VELOCITY(FEET/SEC) =   5.67 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.40   Tc(MIN.) =  14.91
 LONGEST FLOWPATH FROM NODE    351.40 TO NODE    351.10 =  1923.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    351.10 TO NODE    351.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.557
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3157
 SUBAREA AREA(ACRES) =   17.76   SUBAREA RUNOFF(CFS) =   24.28
 TOTAL AREA(ACRES) =     25.91   TOTAL RUNOFF(CFS) =   37.28
 TC(MIN.) =  14.91

****************************************************************************
 FLOW PROCESS FROM NODE    351.10 TO NODE    350.00 IS CODE =  53
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.00  DOWNSTREAM(FEET) =    888.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   495.00   CHANNEL SLOPE =  0.2364
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1755 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     37.28
  FLOW VELOCITY(FEET/SEC) =   7.83 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =  15.97
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    350.00 =  2418.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    350.00 TO NODE    350.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.361
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3039
  SUBAREA AREA(ACRES) =    5.68   SUBAREA RUNOFF(CFS) =    6.19
  TOTAL AREA(ACRES) =     31.59   TOTAL RUNOFF(CFS) =   41.86
  TC(MIN.) =  15.97

****************************************************************************
  FLOW PROCESS FROM NODE    350.00 TO NODE    350.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.97
  RAINFALL INTENSITY(INCH/HR) =   4.36
  TOTAL STREAM AREA(ACRES) =    31.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.86

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       22.34    16.36        4.293         19.26
      2       41.86    15.97        4.361         31.59

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       63.67    15.97       4.361
      2       63.55    16.36       4.293

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     63.67   Tc(MIN.) =   15.97
  TOTAL AREA(ACRES) =     50.85
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    350.00 =  2418.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    350.00 TO NODE    340.00 IS CODE =  53
------------------------------------------------------------------------------
```

```
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    888.00  DOWNSTREAM(FEET) =    851.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.00   CHANNEL SLOPE =  0.0937
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0937 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     63.67
  FLOW VELOCITY(FEET/SEC) =   6.83 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =  16.93
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    340.00 =  2813.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    340.00 TO NODE    340.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.199
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2834
  SUBAREA AREA(ACRES) =   11.88   SUBAREA RUNOFF(CFS) =   12.47
  TOTAL AREA(ACRES) =     62.73   TOTAL RUNOFF(CFS) =   74.64
  TC(MIN.) =  16.93

****************************************************************************
  FLOW PROCESS FROM NODE    340.00 TO NODE    330.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    851.00  DOWNSTREAM(FEET) =    814.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   545.00   CHANNEL SLOPE =  0.0679
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0679 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     74.64
  FLOW VELOCITY(FEET/SEC) =   6.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =  18.41
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    330.00 =  3358.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.978
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2802
  SUBAREA AREA(ACRES) =    6.57   SUBAREA RUNOFF(CFS) =    6.53
  TOTAL AREA(ACRES) =     69.30   TOTAL RUNOFF(CFS) =   77.24
  TC(MIN.) =  18.41

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.41
```

```
 RAINFALL INTENSITY(INCH/HR) =   3.98
 TOTAL STREAM AREA(ACRES) =    69.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     77.24

****************************************************************************
 FLOW PROCESS FROM NODE    331.20 TO NODE    331.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.00
 UPSTREAM ELEVATION(FEET) =   1622.00
 DOWNSTREAM ELEVATION(FEET) =   1585.00
 ELEVATION DIFFERENCE(FEET) =     37.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.845
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.338
 SUBAREA RUNOFF(CFS) =      0.47
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
 FLOW PROCESS FROM NODE    331.10 TO NODE    330.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1585.00  DOWNSTREAM(FEET) =    814.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.00   CHANNEL SLOPE =  0.2711
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1870 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.47
 FLOW VELOCITY(FEET/SEC) =   2.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  19.57   Tc(MIN.) =  25.42
 LONGEST FLOWPATH FROM NODE    331.20 TO NODE    330.00 =  2931.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.231
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3101
 SUBAREA AREA(ACRES) =   42.74   SUBAREA RUNOFF(CFS) =   42.81
 TOTAL AREA(ACRES) =     42.90   TOTAL RUNOFF(CFS) =   42.99
 TC(MIN.) =  25.42

****************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  25.42
 RAINFALL INTENSITY(INCH/HR) =   3.23
 TOTAL STREAM AREA(ACRES) =    42.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.99
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    332.30 TO NODE    332.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    96.80
  UPSTREAM ELEVATION(FEET) =   1375.00
  DOWNSTREAM ELEVATION(FEET) =   1368.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.869
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.514
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE    332.20 TO NODE    332.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1368.00  DOWNSTREAM(FEET) =    980.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1273.00   CHANNEL SLOPE =  0.3048
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1962 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.16
  FLOW VELOCITY(FEET/SEC) =   2.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.55   Tc(MIN.) =  15.42
  LONGEST FLOWPATH FROM NODE    332.30 TO NODE    332.10 =  1369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    332.10 TO NODE    332.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.459
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   17.65   SUBAREA RUNOFF(CFS) =   27.55
  TOTAL AREA(ACRES) =     17.71   TOTAL RUNOFF(CFS) =   27.64
  TC(MIN.) =  15.42

****************************************************************************
  FLOW PROCESS FROM NODE    332.10 TO NODE    330.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    980.00  DOWNSTREAM(FEET) =    814.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1361.00   CHANNEL SLOPE =  0.1220
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1163 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     27.64
  FLOW VELOCITY(FEET/SEC) =   5.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.93   Tc(MIN.) =  19.35
  LONGEST FLOWPATH FROM NODE    332.30 TO NODE    330.00 =  2730.80 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.852
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   13.94   SUBAREA RUNOFF(CFS) =   18.79
  TOTAL AREA(ACRES) =     31.65   TOTAL RUNOFF(CFS) =   42.67
  TC(MIN.) =  19.35

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =  19.35
  RAINFALL INTENSITY(INCH/HR) =   3.85
  TOTAL STREAM AREA(ACRES) =    31.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.67

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       77.24    18.41        3.978         69.30
      2       42.99    25.42        3.231         42.90
      3       42.67    19.35        3.852         31.65

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      148.97    18.41       3.978
      2      150.20    19.35       3.852
      3      141.52    25.42       3.231

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    150.20   Tc(MIN.) =   19.35
  TOTAL AREA(ACRES) =    143.85
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    330.00 =  3358.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    320.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    814.00  DOWNSTREAM(FEET) =    600.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   871.00   CHANNEL SLOPE =  0.2457
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1786 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    150.20
  FLOW VELOCITY(FEET/SEC) =  12.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =  20.51
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    320.00 =  4229.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    320.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.710
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2993
  SUBAREA AREA(ACRES) =   38.87   SUBAREA RUNOFF(CFS) =   40.38
  TOTAL AREA(ACRES) =    182.72   TOTAL RUNOFF(CFS) =  202.89
  TC(MIN.) =  20.51

****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    310.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   600.00  DOWNSTREAM(FEET) =   537.00
  FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  84.0 INCH PIPE IS  18.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.75
  GIVEN PIPE DIAMETER(INCH) =  84.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    202.89
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =  20.77
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE    310.00 =  4729.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.680
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2959
  SUBAREA AREA(ACRES) =   16.93   SUBAREA RUNOFF(CFS) =   16.20
  TOTAL AREA(ACRES) =    199.65   TOTAL RUNOFF(CFS) =  217.44
  TC(MIN.) =  20.77

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE      3.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   537.00  DOWNSTREAM(FEET) =   522.00
  FLOW LENGTH(FEET) =   630.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  84.0 INCH PIPE IS  27.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.79
  GIVEN PIPE DIAMETER(INCH) =  84.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    217.44
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =  21.30
  LONGEST FLOWPATH FROM NODE    351.40 TO NODE      3.00 =  5359.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    199.65  TC(MIN.) =     21.30
  PEAK FLOW RATE(CFS)   =    217.44
============================================================================
```

==========

END OF RATIONAL METHOD ANALYSIS

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR04

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
402	401.8	2	980.0	950.0	110.0	0.25	0.14	Initial Runoff
401.8	401.6	5	950.0	685.0	674.0			Channel Flow
401.8	401.6	8				0.25	3.46	Add Area
401.6	401	5	685.0	585.0	512.0			
401.6	401	8				0.25	8.04	
401	4	4	585.0	515.0	545.0			Ex. 30" CPS Caltrans
								Storm Drain System
							11.64	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 4                                                            *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR04.DAT
  TIME/DATE OF STUDY: 14:22 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    401.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   110.00
  UPSTREAM ELEVATION(FEET) =    980.00
  DOWNSTREAM ELEVATION(FEET) =    950.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
SUBAREA RUNOFF(CFS) =      0.26
TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
FLOW PROCESS FROM NODE    401.80 TO NODE    401.60 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    685.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   674.00   CHANNEL SLOPE =  0.3932
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .2128 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.26
FLOW VELOCITY(FEET/SEC) =   2.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   4.35   Tc(MIN.) =  11.45
LONGEST FLOWPATH FROM NODE    402.00 TO NODE    401.60 =   784.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    401.80 TO NODE    401.60 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.404
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =    3.46   SUBAREA RUNOFF(CFS) =    4.67
TOTAL AREA(ACRES) =      3.60   TOTAL RUNOFF(CFS) =    4.86
TC(MIN.) =  11.45

****************************************************************************
FLOW PROCESS FROM NODE    401.60 TO NODE    401.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    585.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   512.00   CHANNEL SLOPE =  0.1953
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1577 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      4.86
FLOW VELOCITY(FEET/SEC) =   3.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =  13.72
LONGEST FLOWPATH FROM NODE    402.00 TO NODE    401.00 =  1296.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    401.60 TO NODE    401.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.810
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =    8.04   SUBAREA RUNOFF(CFS) =    9.67
```

```
  TOTAL AREA(ACRES) =     11.64   TOTAL RUNOFF(CFS) =   14.00
  TC(MIN.) =  13.72

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE      4.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   585.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =   545.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.15
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     14.00
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =  14.22
  LONGEST FLOWPATH FROM NODE    402.00 TO NODE      4.00 =  1841.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     11.64  TC(MIN.) =     14.22
  PEAK FLOW RATE(CFS)   =     14.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR05

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
510.3	510.2	2	1,210.0	1,180.0	110.0	0.25	0.11	Initial Runoff
510.2	510.1	5	1,180.0	860.0	1,145.0			Channel Flow
510.2	510.1	8				0.25	10.24	Add Area
510.1	510	5	860.0	670.0	787.0			
510.1	510	8				0.25	9.05	
510	5.2	4	670.0	610.0	175.0			EX. 30" CSP Caltrans
5.2	5.1	4	610.0	575.0	225.0			Ex. 36" CSP
5.1	5.1	1						1 of 2
5.5	5.4	2	680.0	610.0	185.0	0.27	0.54	Runoff to 24" CSP/RCP
5.4	5.3	4	610.0	580.0	225.0			First segment 24" pipe
5.3	5.1	4	580.0	575.0	520.0			Second segment 24" pipe
5.1	5.1	1						2 of 2
5.1	5	4	575.0	550.0	100.0			36" CSP
5	5	1						1 of 2
504	503.8	2	1,460.0	1,440.0	75.0	0.35	0.21	Initial Runoff
503.8	503.6	5	1,440.0	1,380.0	300.0			Channel Flow
503.8	503.6	8				0.35	2.05	Add Area
503.6	503	5	1,380.0	965.0	1,225.0			
503.6	503	8				0.30	11.86	
503	502	5	965.0	665.0	1,635.0			
503	502	8				0.25	29.85	
502	501	5	665.0	625.0	540.0			
502	501.5	8				0.25	4.98	
501.5	501	4	625.0	575.0	400.0			Ex. 36" CSP Caltrans
501	5	4	575.0	550.0	110.0			Ex. 42" CSP Caltrans
5	5	1						2 of 2
							68.89	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC.
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 5                                                           *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR05.DAT
  TIME/DATE OF STUDY: 12:06 10/16/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    510.30 TO NODE    510.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   110.00
  UPSTREAM ELEVATION(FEET) =   1210.00
  DOWNSTREAM ELEVATION(FEET) =   1180.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
SUBAREA RUNOFF(CFS) =      0.20
TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
FLOW PROCESS FROM NODE    510.20 TO NODE    510.10 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1180.00  DOWNSTREAM(FEET) =    860.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1145.00   CHANNEL SLOPE =  0.2795
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1898 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.20
FLOW VELOCITY(FEET/SEC) =   2.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   7.82   Tc(MIN.) =  14.92
LONGEST FLOWPATH FROM NODE    510.30 TO NODE    510.10 =  1255.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    510.20 TO NODE    510.10 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.555
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =   10.24   SUBAREA RUNOFF(CFS) =   11.66
TOTAL AREA(ACRES) =     10.35   TOTAL RUNOFF(CFS) =   11.79
TC(MIN.) =  14.92

****************************************************************************
FLOW PROCESS FROM NODE    510.10 TO NODE    510.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    670.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   787.00   CHANNEL SLOPE =  0.2414
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1771 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =     11.79
FLOW VELOCITY(FEET/SEC) =   5.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.45   Tc(MIN.) =  17.37
LONGEST FLOWPATH FROM NODE    510.30 TO NODE    510.00 =  2042.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    510.10 TO NODE    510.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.130
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =    9.05   SUBAREA RUNOFF(CFS) =    9.34
```

```
 TOTAL AREA(ACRES) =     19.40   TOTAL RUNOFF(CFS) =   20.03
 TC(MIN.) =  17.37

****************************************************************************
 FLOW PROCESS FROM NODE    510.00 TO NODE      5.20 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   670.00  DOWNSTREAM(FEET) =   610.00
 FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  30.0 INCH PIPE IS   8.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.50
 GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     20.03
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =  17.53
 LONGEST FLOWPATH FROM NODE    510.30 TO NODE      5.20 =  2217.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.20 TO NODE      5.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   610.00  DOWNSTREAM(FEET) =   575.00
 FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.71
 GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     20.03
 PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =  17.80
 LONGEST FLOWPATH FROM NODE    510.30 TO NODE      5.10 =  2442.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.10 TO NODE      5.10 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  17.80
 RAINFALL INTENSITY(INCH/HR) =   4.07
 TOTAL STREAM AREA(ACRES) =    19.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.03

****************************************************************************
 FLOW PROCESS FROM NODE      5.50 TO NODE      5.40 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
 UPSTREAM ELEVATION(FEET) =    680.00
 DOWNSTREAM ELEVATION(FEET) =    610.00
 ELEVATION DIFFERENCE(FEET) =     70.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.935
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.467
```

```
  SUBAREA RUNOFF(CFS) =      1.09
  TOTAL AREA(ACRES) =      0.54   TOTAL RUNOFF(CFS) =      1.09

****************************************************************************
  FLOW PROCESS FROM NODE      5.40 TO NODE      5.30 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   610.00  DOWNSTREAM(FEET) =   580.00
  FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   2.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.84
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      1.09
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   7.36
  LONGEST FLOWPATH FROM NODE      5.50 TO NODE      5.30 =   410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      5.30 TO NODE      5.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   580.00  DOWNSTREAM(FEET) =   575.00
  FLOW LENGTH(FEET) =   520.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.51
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      1.09
  PIPE TRAVEL TIME(MIN.) =   2.47    Tc(MIN.) =   9.83
  LONGEST FLOWPATH FROM NODE      5.50 TO NODE      5.10 =   930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      5.10 TO NODE      5.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   9.83
  RAINFALL INTENSITY(INCH/HR) =   5.96
  TOTAL STREAM AREA(ACRES) =     0.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.09

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.03    17.80        4.065         19.40
      2        1.09     9.83        5.964          0.54

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.15     9.83       5.964
      2       20.77    17.80       4.065

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     20.77   Tc(MIN.) =   17.80
```

```
 TOTAL AREA(ACRES) =     19.94
 LONGEST FLOWPATH FROM NODE    510.30 TO NODE      5.10 =  2442.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.10 TO NODE      5.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   575.00  DOWNSTREAM(FEET) =   550.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   8.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.40
 GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     20.77
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  17.90
 LONGEST FLOWPATH FROM NODE    510.30 TO NODE      5.00 =  2542.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  17.90
 RAINFALL INTENSITY(INCH/HR) =   4.05
 TOTAL STREAM AREA(ACRES) =    19.94
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.77

****************************************************************************
 FLOW PROCESS FROM NODE    504.00 TO NODE    503.80 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
 UPSTREAM ELEVATION(FEET) =   1460.00
 DOWNSTREAM ELEVATION(FEET) =   1440.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.64
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.64

****************************************************************************
 FLOW PROCESS FROM NODE    503.80 TO NODE    503.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1380.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2000
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1600 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.64
 FLOW VELOCITY(FEET/SEC) =   2.24 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =   7.66
 LONGEST FLOWPATH FROM NODE    504.00 TO NODE    503.60 =   375.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    503.80 TO NODE    503.60 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.004
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    2.05   SUBAREA RUNOFF(CFS) =    5.03
  TOTAL AREA(ACRES) =      2.26   TOTAL RUNOFF(CFS) =    5.54
  TC(MIN.) =   7.66

****************************************************************************
  FLOW PROCESS FROM NODE    503.60 TO NODE    503.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1380.00  DOWNSTREAM(FEET) =    965.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1225.00   CHANNEL SLOPE =  0.3388
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2033 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      5.54
  FLOW VELOCITY(FEET/SEC) =   4.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.57   Tc(MIN.) =  12.23
  LONGEST FLOWPATH FROM NODE    504.00 TO NODE    503.00 =  1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    503.60 TO NODE    503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.179
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3080
  SUBAREA AREA(ACRES) =   11.86   SUBAREA RUNOFF(CFS) =   18.43
  TOTAL AREA(ACRES) =     14.12   TOTAL RUNOFF(CFS) =   22.52
  TC(MIN.) =  12.23

****************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    502.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    965.00  DOWNSTREAM(FEET) =    665.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1635.00   CHANNEL SLOPE =  0.1835
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1517 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     22.52
  FLOW VELOCITY(FEET/SEC) =   6.15 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.43   Tc(MIN.) =  16.66
  LONGEST FLOWPATH FROM NODE    504.00 TO NODE    502.00 =  3235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.243
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2686
  SUBAREA AREA(ACRES) =   29.85   SUBAREA RUNOFF(CFS) =   31.66
  TOTAL AREA(ACRES) =     43.97   TOTAL RUNOFF(CFS) =   50.12
  TC(MIN.) =  16.66

**************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    501.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    665.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.0741
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0741 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     50.12
  FLOW VELOCITY(FEET/SEC) =   5.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.60   Tc(MIN.) =  18.26
  LONGEST FLOWPATH FROM NODE    504.00 TO NODE    501.00 =  3775.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    501.50 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.999
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2667
  SUBAREA AREA(ACRES) =    4.98   SUBAREA RUNOFF(CFS) =    4.98
  TOTAL AREA(ACRES) =     48.95   TOTAL RUNOFF(CFS) =   52.21
  TC(MIN.) =  18.26

**************************************************************************
  FLOW PROCESS FROM NODE    501.50 TO NODE    501.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   625.00  DOWNSTREAM(FEET) =   575.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  16.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.51
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     52.21
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =  18.67
  LONGEST FLOWPATH FROM NODE    504.00 TO NODE    501.00 =  4175.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE      5.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   575.00  DOWNSTREAM(FEET) =   550.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  13.1 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.33
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     52.21
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =  18.76
  LONGEST FLOWPATH FROM NODE    504.00 TO NODE      5.00 =  4285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.76
  RAINFALL INTENSITY(INCH/HR) =   3.93
  TOTAL STREAM AREA(ACRES) =    48.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.21

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.77    17.90        4.050         19.94
      2       52.21    18.76        3.930         48.95

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       70.61    17.90       4.050
      2       72.37    18.76       3.930

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     72.37   Tc(MIN.) =   18.76
  TOTAL AREA(ACRES) =     68.89
  LONGEST FLOWPATH FROM NODE    504.00 TO NODE      5.00 =  4285.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     68.89  TC(MIN.) =     18.76
  PEAK FLOW RATE(CFS)   =     72.37
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR06

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
602	601.5	2	725.0	680.0	76.0	0.3	0.22	
601.5	601	5	680.0	625.0	223.0			
601.5	601	8				0.3	2.23	
601	6	4	625.0	600.0	360.0			Ex. 24" Caltrans
								Storm Drain
							2.45	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 6                                                           *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR06.DAT
  TIME/DATE OF STUDY: 11:23 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    601.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    76.00
  UPSTREAM ELEVATION(FEET) =    725.00
  DOWNSTREAM ELEVATION(FEET) =    680.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.827
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.354
 SUBAREA RUNOFF(CFS) =      0.55
 TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
 FLOW PROCESS FROM NODE    601.50 TO NODE    601.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    625.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   223.00   CHANNEL SLOPE =  0.2466
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1789 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.55
 FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =   7.40
 LONGEST FLOWPATH FROM NODE    602.00 TO NODE    601.00 =   299.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    601.50 TO NODE    601.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.163
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    2.23   SUBAREA RUNOFF(CFS) =    4.79
 TOTAL AREA(ACRES) =      2.45   TOTAL RUNOFF(CFS) =    5.27
 TC(MIN.) =   7.40

****************************************************************************
 FLOW PROCESS FROM NODE    601.00 TO NODE      6.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   625.00  DOWNSTREAM(FEET) =   600.00
 FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.26
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      5.27
 PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   7.93
 LONGEST FLOWPATH FROM NODE    602.00 TO NODE      6.00 =   659.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      2.45  TC(MIN.) =      7.93
 PEAK FLOW RATE(CFS)   =      5.27
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR07

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
702	701.5	2	770.0	735.0	84.0	0.30	0.14	
701.5	701	5	735.0	625.0	347.0			
701.5	701	8				0.28	1.96	
701	7	4	625.0	580.0	375.0			EX. 24" CSP Caltrans
								Storm Drain
							2.1	Total Area

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Job #:
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Date:
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Run Name:
MERR07
Page 2

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Run Name:
MERR07
Page 3

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Date:
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Job #:
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Run Name:
MERR07

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

```
**************************************************************************

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                              Analysis prepared by:

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                           SAN DIEGO, CALIFORNIA 92122
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 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 7                                                            *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR07.DAT
  TIME/DATE OF STUDY: 11:26 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    701.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    84.00
  UPSTREAM ELEVATION(FEET) =    770.00
  DOWNSTREAM ELEVATION(FEET) =    735.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.126
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.089
 SUBAREA RUNOFF(CFS) =      0.34
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
 FLOW PROCESS FROM NODE    701.50 TO NODE    701.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    625.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   347.00   CHANNEL SLOPE =  0.3170
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1993 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.34
 FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.31   Tc(MIN.) =   8.44
 LONGEST FLOWPATH FROM NODE    702.00 TO NODE    701.00 =   431.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    701.50 TO NODE    701.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.579
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2813
 SUBAREA AREA(ACRES) =    1.96   SUBAREA RUNOFF(CFS) =    3.61
 TOTAL AREA(ACRES) =      2.10   TOTAL RUNOFF(CFS) =    3.89
 TC(MIN.) =   8.44

****************************************************************************
 FLOW PROCESS FROM NODE    701.00 TO NODE      7.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   625.00  DOWNSTREAM(FEET) =   580.00
 FLOW LENGTH(FEET) =   375.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.11
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      3.89
 PIPE TRAVEL TIME(MIN.) =   0.77    Tc(MIN.) =   9.21
 LONGEST FLOWPATH FROM NODE    702.00 TO NODE      7.00 =   806.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      2.10  TC(MIN.) =      9.21
 PEAK FLOW RATE(CFS)   =      3.89
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR08

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
804	803	2	900.0	825.0	120.0	0.25	0.28	
803	802	5	825.0	660.0	518.0			
803	802	8				0.25	5.69	
802	801	5	660.0	590.0	395.0			
802	801	8				0.28	5.7	
801	8	4	590.0	560.0	425.0			EX. 30" CSP Caltrans
								Strorm Drain
							11.67	Total Area

```
**************************************************************************

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                           SAN DIEGO, CALIFORNIA 92122
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 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 8                                                           *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR08.DAT
  TIME/DATE OF STUDY: 11:27 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    803.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   120.00
  UPSTREAM ELEVATION(FEET) =    900.00
  DOWNSTREAM ELEVATION(FEET) =    825.00
  ELEVATION DIFFERENCE(FEET) =     75.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
SUBAREA RUNOFF(CFS) =      0.51
TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.51

****************************************************************************
FLOW PROCESS FROM NODE    803.00 TO NODE    802.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    660.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   518.00   CHANNEL SLOPE =  0.3185
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1996 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.51
FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   3.45   Tc(MIN.) =  10.55
LONGEST FLOWPATH FROM NODE    804.00 TO NODE    802.00 =   638.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    803.00 TO NODE    802.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.696
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =    5.69   SUBAREA RUNOFF(CFS) =    8.10
TOTAL AREA(ACRES) =      5.97   TOTAL RUNOFF(CFS) =    8.50
TC(MIN.) =  10.55

****************************************************************************
FLOW PROCESS FROM NODE    802.00 TO NODE    801.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    660.00  DOWNSTREAM(FEET) =    590.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   395.00   CHANNEL SLOPE =  0.1772
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1486 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      8.50
FLOW VELOCITY(FEET/SEC) =   4.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =  12.05
LONGEST FLOWPATH FROM NODE    804.00 TO NODE    801.00 =  1033.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    802.00 TO NODE    801.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.229
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2647
SUBAREA AREA(ACRES) =    5.70   SUBAREA RUNOFF(CFS) =    8.35
```

```
  TOTAL AREA(ACRES) =     11.67   TOTAL RUNOFF(CFS) =   16.15
  TC(MIN.) =  12.05

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE      8.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   590.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) =   425.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.30
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     16.15
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =  12.51
  LONGEST FLOWPATH FROM NODE    804.00 TO NODE      8.00 =  1458.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     11.67  TC(MIN.) =     12.51
  PEAK FLOW RATE(CFS)   =     16.15
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR09

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
903	902.8	2	1,015.0	985.0	75.0	0.25	0.15	
902.8	902.6	5	985.0	905.0	300.0			
902.8	902.6	8				0.25	0.58	
902.6	902.4	5	905.0	705.0	658.0			
902.6	902.4	8				0.25	6.61	
902.4	902	5	705.0	645.0	277.0			
902.4	902	8				0.26	3.86	
902	901	5	645.0	580.0	540.0			
902	901	8				0.27	14.64	
901	9	4	580.0	560.0	555.0			EX. 42" CSP Caltrans
							25.84	Total Area

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Job Name:
Merriam Mountains - Existing Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MERR09

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Job Name:
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Date:
October 2006

Job #:
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Run Name:
MERR09

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Job Name:
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Date:
October 2006

Job #:
2469.01A

Run Name:
MERR09

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

```
**************************************************************************

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                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
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 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 9                                                            *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR09.DAT
  TIME/DATE OF STUDY: 12:43 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    902.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1015.00
  DOWNSTREAM ELEVATION(FEET) =    985.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
 SUBAREA RUNOFF(CFS) =      0.30
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
 FLOW PROCESS FROM NODE    902.80 TO NODE    902.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    985.00  DOWNSTREAM(FEET) =    905.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2667
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1856 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.30
 FLOW VELOCITY(FEET/SEC) =   2.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =   8.22
 LONGEST FLOWPATH FROM NODE    903.00 TO NODE    902.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    902.80 TO NODE    902.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.690
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    0.58   SUBAREA RUNOFF(CFS) =    0.97
 TOTAL AREA(ACRES) =      0.73   TOTAL RUNOFF(CFS) =    1.22
 TC(MIN.) =   8.22

****************************************************************************
 FLOW PROCESS FROM NODE    902.60 TO NODE    902.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    905.00  DOWNSTREAM(FEET) =    705.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   658.00   CHANNEL SLOPE =  0.3040
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1960 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.22
 FLOW VELOCITY(FEET/SEC) =   2.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.14   Tc(MIN.) =  12.36
 LONGEST FLOWPATH FROM NODE    903.00 TO NODE    902.40 =  1033.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    902.60 TO NODE    902.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.143
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    6.61   SUBAREA RUNOFF(CFS) =    8.50
 TOTAL AREA(ACRES) =      7.34   TOTAL RUNOFF(CFS) =    9.44
 TC(MIN.) =  12.36
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    902.40 TO NODE    902.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    705.00  DOWNSTREAM(FEET) =    645.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   277.00   CHANNEL SLOPE =  0.2166
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1683 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      9.44
  FLOW VELOCITY(FEET/SEC) =   4.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.95   Tc(MIN.) =  13.31
  LONGEST FLOWPATH FROM NODE    903.00 TO NODE    902.00 =  1310.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    902.40 TO NODE    902.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.903
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2534
  SUBAREA AREA(ACRES) =    3.86   SUBAREA RUNOFF(CFS) =    4.92
  TOTAL AREA(ACRES) =     11.20   TOTAL RUNOFF(CFS) =   13.92
  TC(MIN.) =  13.31

**************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    901.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    645.00  DOWNSTREAM(FEET) =    580.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.1204
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1152 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     13.92
  FLOW VELOCITY(FEET/SEC) =   4.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.97   Tc(MIN.) =  15.28
  LONGEST FLOWPATH FROM NODE    903.00 TO NODE    901.00 =  1850.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    901.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.485
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2628
  SUBAREA AREA(ACRES) =   14.64   SUBAREA RUNOFF(CFS) =   17.73
  TOTAL AREA(ACRES) =     25.84   TOTAL RUNOFF(CFS) =   30.46
  TC(MIN.) =  15.28

**************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE      9.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   580.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) =   555.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  16.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.00
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     30.46
  PIPE TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =  16.31
  LONGEST FLOWPATH FROM NODE    903.00 TO NODE      9.00 =  2405.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     25.84  TC(MIN.) =     16.31
  PEAK FLOW RATE(CFS)   =     30.46
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

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Job Name:
Sierra - Existing Hydrology

Date:
Sept 2016

Job #:
2660-002-02

Run Name:
E-10.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1041	1038	2	1,485.0	1,470.0	75.0	0.35	0.61	Initial
1038	1036	5	1,470.0	1,460.0	300.0	0.35	2.18	
1036	1034	5	1,460.0	1,325.0	643.0	0.35	8.11	
1034	1030	5	1,325.0	1,175.0	646.0	0.35	20.56	
1030	1030	1						1 of 2
1031	1030.8	2	1,420.0	1,410.0	75.0	0.35	0.08	Initial
1030.8	1030.6	5	1,410.0	1,365.0	300.0	0.35	0.72	
1030.6	1030.4	5	1,365.0	1,285.0	600.0	0.35	3.73	
1030.4	1030	5	1,285.0	1,175.0	1,840.0	0.35	46.29	
1030	1030	1						2 of 2
1030	1023	5	1,175.0	950.0	1,130.0	0.34	40.13	
1023	1023	1						1 of 2
1025	1024.8	2	1,480.0	1,470.0	75.0	0.35	1.77	
1024.8	1024.4	5	1,470.0	1,440.0	300.0	0.35	6.04	
1024.6	1024.4	5	1,440.0	1,360.0	600.0	0.35	17.55	
1024.4	1024	5	1,360.0	1,080.0	1,175.0	0.35	68.27	
1024	1023	5	1,080.0	950.0	805.0			
1023	1023	1						2 of 2
1023	1021	5	950.0	750.0	2,070.0	0.29	91.65	
1021	1002	5	750.0	675.0	625.0			
1002	1002	1						1 of 2
1004	1003.8	2	1,450.0	1,435.0	75.0	0.35	0.27	Initial
1003.8	1003.6	5	1,435.0	1,410.0	300.0	0.35	2.85	
1003.6	1003.4	5	1,410.0	1,135.0	818.0	0.27	13.89	
1003.4	1003	5	1,135.0	965.0	1,370.0	0.28	55.8	
1003	1002	5	975.0	700.0	1,941.0	0.27	106.38	
1002	1002	1						2 of 2
1002	1001	5	700.0	675.0	1,175.0			
1001	10	4	675.0	550.0	755.0			Ex. 42" CSP Caltrans

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - EXISTING HYDROLOGY                                    *
* SUBBASIN 10 - NO DETENTION                                             *
* 2660.02 - AUGUST 2016                                                  *
 ************************************************************************

  FILE NAME: E-10.DAT
  TIME/DATE OF STUDY: 17:21 08/26/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1041.00 TO NODE   1038.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1470.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
  SUBAREA RUNOFF(CFS) =      1.87
  TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      1.87

****************************************************************************
  FLOW PROCESS FROM NODE   1038.00 TO NODE   1036.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1455.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0500
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.743
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.43
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   1.13
  Tc(MIN.) =    6.56
  SUBAREA AREA(ACRES) =     2.18       SUBAREA RUNOFF(CFS) =    5.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.8         PEAK FLOW RATE(CFS) =       7.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   5.10
  LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1036.00 =     375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1036.00 TO NODE   1034.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1455.00  DOWNSTREAM(FEET) =   1320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00   CHANNEL SLOPE =  0.2143
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.095
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.04
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.95
  Tc(MIN.) =    7.51
  SUBAREA AREA(ACRES) =     8.11       SUBAREA RUNOFF(CFS) =   20.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       10.9         PEAK FLOW RATE(CFS) =      27.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =  12.54
  LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1034.00 =    1005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1034.00 TO NODE   1030.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.00  DOWNSTREAM(FEET) =   1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   695.00   CHANNEL SLOPE =  0.2302
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.674
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.49
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   0.75
  Tc(MIN.) =    8.25
  SUBAREA AREA(ACRES) =    20.56       SUBAREA RUNOFF(CFS) =   48.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       31.5         PEAK FLOW RATE(CFS) =      73.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =  17.13
  LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1030.00 =    1700.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1030.00 TO NODE   1030.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.25
  RAINFALL INTENSITY(INCH/HR) =   6.67
  TOTAL STREAM AREA(ACRES) =    31.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     73.48

****************************************************************************
  FLOW PROCESS FROM NODE   1031.00 TO NODE   1030.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1620.00
  DOWNSTREAM ELEVATION(FEET) =   1590.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE   1030.80 TO NODE   1030.60 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1590.00  DOWNSTREAM(FEET) =   1515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE =  0.2778
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.899
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.84
  AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =   0.93
```

```
  Tc(MIN.) =    6.36
  SUBAREA AREA(ACRES) =     0.72       SUBAREA RUNOFF(CFS) =    1.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       2.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   5.83
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.60 =     345.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1030.60 TO NODE   1030.40 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1515.00  DOWNSTREAM(FEET) =   1450.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   565.00   CHANNEL SLOPE =  0.1150
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.929
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.58
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.43
  Tc(MIN.) =    7.79
  SUBAREA AREA(ACRES) =     3.73       SUBAREA RUNOFF(CFS) =    9.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =      10.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   7.58
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.40 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1030.40 TO NODE   1030.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.00  DOWNSTREAM(FEET) =   1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1530.00   CHANNEL SLOPE =  0.1895
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.107
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
```

```
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.14
 AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   1.68
 Tc(MIN.) =    9.47
 SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =   98.94
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =       50.8          PEAK FLOW RATE(CFS) =     108.62

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =  17.84
 LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.00 =    2440.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1030.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.47
 RAINFALL INTENSITY(INCH/HR) =   6.11
 TOTAL STREAM AREA(ACRES) =    50.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    108.62

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       73.48     8.25        6.674         31.46
     2      108.62     9.47        6.107         50.82

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      168.14     8.25       6.674
     2      175.86     9.47       6.107

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     175.86   Tc(MIN.) =    9.47
 TOTAL AREA(ACRES) =       82.3
 LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.00 =    2440.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1023.00 IS CODE =  51
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00   CHANNEL SLOPE =  0.1991
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.772
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     215.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.75
  AVERAGE FLOW DEPTH(FEET) =   1.60   TRAVEL TIME(MIN.) =   0.87
  Tc(MIN.) =   10.34
  SUBAREA AREA(ACRES) =    40.13       SUBAREA RUNOFF(CFS) =   78.75
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.347
  TOTAL AREA(ACRES) =      122.4         PEAK FLOW RATE(CFS) =     244.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.70   FLOW VELOCITY(FEET/SEC.) =  22.55
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1023.00 =    3570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1023.00 TO NODE   1023.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.34
  RAINFALL INTENSITY(INCH/HR) =   5.77
  TOTAL STREAM AREA(ACRES) =   122.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    244.97

****************************************************************************
  FLOW PROCESS FROM NODE   1025.00 TO NODE   1024.80 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1470.00
  ELEVATION DIFFERENCE(FEET) =     10.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
  SUBAREA RUNOFF(CFS) =      5.42
  TOTAL AREA(ACRES) =      1.77   TOTAL RUNOFF(CFS) =      5.42

****************************************************************************
  FLOW PROCESS FROM NODE   1024.80 TO NODE   1024.40 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1440.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.145
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.89
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   0.63
  Tc(MIN.) =    6.06
  SUBAREA AREA(ACRES) =     6.04       SUBAREA RUNOFF(CFS) =   17.22
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      22.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   9.02
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1024.40 =     375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1024.60 TO NODE   1024.40 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1360.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1333
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.507
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.24
```

```
 AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   0.82
 Tc(MIN.) =    6.88
 SUBAREA AREA(ACRES) =    17.55       SUBAREA RUNOFF(CFS) =   46.11
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =       25.4         PEAK FLOW RATE(CFS) =      66.64

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =  13.68
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1024.40 =     975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1024.40 TO NODE   1024.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1360.00  DOWNSTREAM(FEET) =   1080.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.2383
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.918
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.36
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.06
 AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   0.93
 Tc(MIN.) =    7.81
 SUBAREA AREA(ACRES) =    68.27       SUBAREA RUNOFF(CFS) =  165.30
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =       93.6         PEAK FLOW RATE(CFS) =     226.70

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =  23.54
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1024.00 =    2150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1024.00 TO NODE   1023.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   805.00   CHANNEL SLOPE =  0.1615
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1407 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     226.70
 FLOW VELOCITY(FEET/SEC) =  12.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    8.86
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1023.00 =    2955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1023.00 TO NODE   1023.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.86
  RAINFALL INTENSITY(INCH/HR) =   6.38
  TOTAL STREAM AREA(ACRES) =    93.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    226.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      244.97    10.34        5.772        122.41
      2      226.70     8.86        6.377         93.63

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      448.41     8.86       6.377
      2      450.14    10.34       5.772

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     450.14   Tc(MIN.) =   10.34
  TOTAL AREA(ACRES) =      216.0
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1023.00 =    3570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1023.00 TO NODE   1021.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    750.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2070.00   CHANNEL SLOPE =  0.0966
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.245
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     519.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.87
  AVERAGE FLOW DEPTH(FEET) =   2.86   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =   11.99
  SUBAREA AREA(ACRES) =    91.65       SUBAREA RUNOFF(CFS) =  139.41
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.331
  TOTAL AREA(ACRES) =      307.7         PEAK FLOW RATE(CFS) =     533.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =  20.99
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1021.00 =    5640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1021.00 TO NODE   1002.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   625.00   CHANNEL SLOPE =  0.1200
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1150 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     533.92
  FLOW VELOCITY(FEET/SEC) =  15.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   12.67
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1002.00 =    6265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.67
  RAINFALL INTENSITY(INCH/HR) =   5.06
  TOTAL STREAM AREA(ACRES) =   307.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    533.92

****************************************************************************
  FLOW PROCESS FROM NODE   1004.00 TO NODE   1003.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1450.00
  DOWNSTREAM ELEVATION(FEET) =   1435.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   1003.80 TO NODE   1003.60 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1435.00  DOWNSTREAM(FEET) =   1410.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0833
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.867
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   0.97
  Tc(MIN.) =    6.40
  SUBAREA AREA(ACRES) =     2.85       SUBAREA RUNOFF(CFS) =    7.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        3.1         PEAK FLOW RATE(CFS) =       8.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   6.34
  LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1003.60 =     375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.60 TO NODE   1003.40 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1410.00  DOWNSTREAM(FEET) =   1135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   818.00   CHANNEL SLOPE =  0.3362
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.162
```

```
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.61
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.00
  Tc(MIN.) =    7.40
  SUBAREA AREA(ACRES) =    13.89       SUBAREA RUNOFF(CFS) =   26.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.285
  TOTAL AREA(ACRES) =       17.0         PEAK FLOW RATE(CFS) =      34.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =  15.79
  LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1003.40 =    1193.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.40 TO NODE   1003.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    965.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.00   CHANNEL SLOPE =  0.1241
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.310
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      84.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.21
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   1.61
  Tc(MIN.) =    9.00
  SUBAREA AREA(ACRES) =    55.80       SUBAREA RUNOFF(CFS) =   98.58
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.281
  TOTAL AREA(ACRES) =       72.8         PEAK FLOW RATE(CFS) =     129.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.40   FLOW VELOCITY(FEET/SEC.) =  15.92
  LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1003.00 =    2563.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1002.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    975.00  DOWNSTREAM(FEET) =    700.00
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.00   CHANNEL SLOPE =  0.1417
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.646
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     210.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.09
 AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   1.69
 Tc(MIN.) =   10.70
 SUBAREA AREA(ACRES) =   106.38       SUBAREA RUNOFF(CFS) =  162.16
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.275
 TOTAL AREA(ACRES) =      179.2         PEAK FLOW RATE(CFS) =     277.71

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =  20.51
 LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1002.00 =    4504.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.70
 RAINFALL INTENSITY(INCH/HR) =   5.65
 TOTAL STREAM AREA(ACRES) =   179.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    277.71

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      533.92    12.67        5.063        307.69
     2      277.71    10.70        5.646        179.19

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      756.47    10.70       5.646
     2      782.94    12.67       5.063

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =     782.94   Tc(MIN.) =   12.67
  TOTAL AREA(ACRES) =      486.9
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1002.00 =    6265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1001.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.0213
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0213 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     782.94
  FLOW VELOCITY(FEET/SEC) =   7.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.61   Tc(MIN.) =   15.28
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1001.00 =    7440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE     10.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   675.00  DOWNSTREAM(FEET) =   550.00
  FLOW LENGTH(FEET) =   755.00   MANNING'S N =  0.015
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.58
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     782.94
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   15.60
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE     10.00 =    8195.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      486.9  TC(MIN.) =     15.60
  PEAK FLOW RATE(CFS)   =     782.94
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
E-11.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1121	1120	2	1325	1280	100	0.35	0.18				
1120	1119	5	1280	850	800	0.3	3.75				
1119	1103	5	850	750	535	0.3	8.63				
1103	1103	1						1 OF 2			
1124	1123	2	1165	1145	70	0.35	0.06				
1123	1122	5	1145	765	690	0.29	9.16				
1122	1103	3	759	744	365						
1103	1103	1						2 OF 2			
1103	11	3	744	625	615						
							21.78				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2012 Advanced Engineering Software (aes)
              Ver. 19.0 Release Date: 06/01/2012  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                                6390 Greenwich Dr.
                                    Suite 170
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* EXISTING HYDROLOGY                                                      *
* BASIN 11                                                                *
* JANUARY 2015                                                            *
 **************************************************************************

  FILE NAME: E-11.DAT
  TIME/DATE OF STUDY: 10:09 01/15/2015
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1121.00 TO NODE   1120.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1325.00
  DOWNSTREAM ELEVATION(FEET) =   1280.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE   1120.00 TO NODE   1119.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =    850.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   800.00   CHANNEL SLOPE =  0.5375
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.967
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.16
 AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   1.46
 Tc(MIN.) =    7.72
 SUBAREA AREA(ACRES) =     3.75       SUBAREA RUNOFF(CFS) =    7.84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.302
 TOTAL AREA(ACRES) =        3.9         PEAK FLOW RATE(CFS) =       8.28

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =  11.60
 LONGEST FLOWPATH FROM NODE   1121.00 TO NODE   1119.00 =     900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1119.00 TO NODE   1103.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =    750.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   535.00   CHANNEL SLOPE =  0.1869
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.504
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.66
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.26
 AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.87
 Tc(MIN.) =    8.59
 SUBAREA AREA(ACRES) =     8.59       SUBAREA RUNOFF(CFS) =   16.76
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.301
 TOTAL AREA(ACRES) =       12.5         PEAK FLOW RATE(CFS) =      24.49

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =  11.56
 LONGEST FLOWPATH FROM NODE   1121.00 TO NODE   1103.00 =    1435.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1103.00 TO NODE   1103.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.59
  RAINFALL INTENSITY(INCH/HR) =   6.50
  TOTAL STREAM AREA(ACRES) =    12.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.49

****************************************************************************
  FLOW PROCESS FROM NODE   1124.00 TO NODE   1123.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1165.00
  DOWNSTREAM ELEVATION(FEET) =   1145.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.243
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.944
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
  FLOW PROCESS FROM NODE   1123.00 TO NODE   1122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =    765.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.00   CHANNEL SLOPE =  0.5507
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.074
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.76
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   0.90
  Tc(MIN.) =    6.14
  SUBAREA AREA(ACRES) =     9.16       SUBAREA RUNOFF(CFS) =   21.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.290
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      21.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =  16.06
  LONGEST FLOWPATH FROM NODE   1124.00 TO NODE   1122.00 =     760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1122.00 TO NODE   1103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   759.00  DOWNSTREAM(FEET) =   744.00
  FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.75
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.62
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    6.59
  LONGEST FLOWPATH FROM NODE   1124.00 TO NODE   1103.00 =    1125.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1103.00 TO NODE   1103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.59
  RAINFALL INTENSITY(INCH/HR) =   7.72
  TOTAL STREAM AREA(ACRES) =     9.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.62

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       24.49     8.59        6.504         12.52
      2       21.62     6.59        7.720          9.22

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       40.39     6.59       7.720
      2       42.70     8.59       6.504

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.70   Tc(MIN.) =    8.59
  TOTAL AREA(ACRES) =       21.7
  LONGEST FLOWPATH FROM NODE   1121.00 TO NODE   1103.00 =    1435.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1103.00 TO NODE     11.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   744.00  DOWNSTREAM(FEET) =   625.00
  FLOW LENGTH(FEET) =   615.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.27
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.70
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    8.95
  LONGEST FLOWPATH FROM NODE   1121.00 TO NODE     11.00 =    2050.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       21.7  TC(MIN.) =      8.95
  PEAK FLOW RATE(CFS)   =      42.70
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR12

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1203	1202.8	2	1,160.0	1,110.0	75.0	0.35	0.69	
1202.8	1202.6	5	1,110.0	1,055.0	300.0			
1202.8	1202.6	8				0.35	1.56	
1202.6	1202	5	1,055.0	1,040.0	137.0			
1202.6	1202	8				0.35	1.08	
1202	1201	5	1,040.0	775.0	910.0			
1202	1201	8				0.28	10.88	
1201	12	4	775.0	650.0	545.0			EX . 36" CSP Caltrans
								Storm Drain
							14.21	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 12                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR12.DAT
  TIME/DATE OF STUDY: 12:47 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1203.00 TO NODE   1202.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1160.00
  DOWNSTREAM ELEVATION(FEET) =   1110.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      2.11
 TOTAL AREA(ACRES) =      0.69   TOTAL RUNOFF(CFS) =      2.11

****************************************************************************
 FLOW PROCESS FROM NODE   1202.80 TO NODE   1202.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1110.00  DOWNSTREAM(FEET) =   1055.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1833
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1517 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.11
 FLOW VELOCITY(FEET/SEC) =   2.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   7.21
 LONGEST FLOWPATH FROM NODE   1203.00 TO NODE   1202.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1202.80 TO NODE   1202.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.280
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    1.56   SUBAREA RUNOFF(CFS) =    3.97
 TOTAL AREA(ACRES) =      2.25   TOTAL RUNOFF(CFS) =    5.73
 TC(MIN.) =   7.21

****************************************************************************
 FLOW PROCESS FROM NODE   1202.60 TO NODE   1202.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =   1040.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   137.00   CHANNEL SLOPE =  0.1095
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1071 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.73
 FLOW VELOCITY(FEET/SEC) =   3.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   7.91
 LONGEST FLOWPATH FROM NODE   1203.00 TO NODE   1202.00 =   512.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1202.60 TO NODE   1202.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.859
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    1.08   SUBAREA RUNOFF(CFS) =    2.59
 TOTAL AREA(ACRES) =      3.33   TOTAL RUNOFF(CFS) =    7.99
 TC(MIN.) =   7.91

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   1202.00 TO NODE   1201.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1040.00  DOWNSTREAM(FEET) =    775.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   910.00   CHANNEL SLOPE =  0.2912
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1928 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      7.99
  FLOW VELOCITY(FEET/SEC) =   4.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.09   Tc(MIN.) =  11.00
  LONGEST FLOWPATH FROM NODE   1203.00 TO NODE   1201.00 =  1422.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1202.00 TO NODE   1201.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.546
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2964
  SUBAREA AREA(ACRES) =   10.88   SUBAREA RUNOFF(CFS) =   16.90
  TOTAL AREA(ACRES) =     14.21   TOTAL RUNOFF(CFS) =   23.36
  TC(MIN.) =  11.00

****************************************************************************
  FLOW PROCESS FROM NODE   1201.00 TO NODE     12.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   775.00  DOWNSTREAM(FEET) =   650.00
  FLOW LENGTH(FEET) =   545.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.45
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     23.36
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =  11.55
  LONGEST FLOWPATH FROM NODE   1203.00 TO NODE     12.00 =  1967.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     14.21  TC(MIN.) =     11.55
  PEAK FLOW RATE(CFS)   =     23.36
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX B

Existing Detention Storage Analysis

SUB-BASIN 13

FUSCOE
ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR13

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1305	1304.8	2	1,350.0	1,315.0	75.0	0.25	0.36	
1304.8	1304.6	5	1,315.0	1,270.0	300.0			
1304.8	1304.6	8				0.26	2.77	
1304.6	1304.4	5	1,270.0	195.0	600.0			
1304.6	1304.4	8				0.28	9.59	
1304.4	1304	5	1,195.0	1,150.0	315.0			
1304.4	1304	8				0.28	5.42	
1304	1303	5	1,150.0	835.0	1,044.0			
1304	1303	8				0.30	58.45	
1303	1301	5	835.0	795.0	875.0			
1302	1301	8				0.27	53.44	
1301	13	4	795.0	700.0	645.0			EX. 36" RCP Caltrans
								Storm Drain
							130.03	Total Area

```
**************************************************************************

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          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTIANS - EXISTING HYDROLOGY                                  *
* SUBBASIN 13 - NO DETENTION ROUTING                                      *
* 2469.01A - MARCH 2007                                                   *
 **************************************************************************

  FILE NAME: MERR13.DAT
  TIME/DATE OF STUDY: 09:59 03/15/2007
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1305.00 TO NODE   1304.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1350.00
  DOWNSTREAM ELEVATION(FEET) =   1315.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      1.10
 TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      1.10

****************************************************************************
 FLOW PROCESS FROM NODE   1304.80 TO NODE   1306.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1315.00  DOWNSTREAM(FEET) =   1270.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1350 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.10
 FLOW VELOCITY(FEET/SEC) =   2.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.35   Tc(MIN.) =   7.78
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1306.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.80 TO NODE   1304.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.934
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     2.77   SUBAREA RUNOFF(CFS) =    6.72
 TOTAL AREA(ACRES) =      3.13   TOTAL RUNOFF(CFS) =    7.60
 TC(MIN.) =   7.78

****************************************************************************
 FLOW PROCESS FROM NODE   1304.60 TO NODE   1304.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1270.00  DOWNSTREAM(FEET) =   1195.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1250
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1183 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.60
 FLOW VELOCITY(FEET/SEC) =   3.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.64   Tc(MIN.) =  10.42
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1304.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.60 TO NODE   1304.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.742
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     9.59   SUBAREA RUNOFF(CFS) =   19.27
 TOTAL AREA(ACRES) =     12.72   TOTAL RUNOFF(CFS) =   25.56
 TC(MIN.) =  10.42

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1304.40 TO NODE   1304.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =   1150.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   315.00   CHANNEL SLOPE =  0.1429
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1302 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     25.56
 FLOW VELOCITY(FEET/SEC) =   5.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.88   Tc(MIN.) =  11.31
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1304.00 =  1290.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.40 TO NODE   1304.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.449
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    5.42   SUBAREA RUNOFF(CFS) =   10.34
 TOTAL AREA(ACRES) =     18.14   TOTAL RUNOFF(CFS) =   34.59
 TC(MIN.) =  11.31

****************************************************************************
 FLOW PROCESS FROM NODE   1304.00 TO NODE   1303.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    835.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1044.00   CHANNEL SLOPE =  0.3017
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1954 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     34.59
 FLOW VELOCITY(FEET/SEC) =   8.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =  13.46
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1303.00 =  2334.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.00 TO NODE   1303.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.868
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =   58.45   SUBAREA RUNOFF(CFS) =   99.58
 TOTAL AREA(ACRES) =     76.59   TOTAL RUNOFF(CFS) =  130.48
 TC(MIN.) =  13.46

****************************************************************************
 FLOW PROCESS FROM NODE   1303.00 TO NODE   1301.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   875.00   CHANNEL SLOPE =  0.0457
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0457 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    130.48
  FLOW VELOCITY(FEET/SEC) =   6.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =  15.87
  LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1301.00 =  3209.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.378
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   53.44   SUBAREA RUNOFF(CFS) =   81.88
  TOTAL AREA(ACRES) =    130.03   TOTAL RUNOFF(CFS) =  199.24
  TC(MIN.) =  15.87

****************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   795.00  DOWNSTREAM(FEET) =   700.00
  FLOW LENGTH(FEET) =   645.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.26
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    199.24
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  16.15
  LONGEST FLOWPATH FROM NODE   1305.00 TO NODE     13.00 =  3854.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    130.03  TC(MIN.) =     16.15
  PEAK FLOW RATE(CFS)    =    199.24
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

FUSCOE ENGINEERING
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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR141

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1412	1411	2	1,175.0	1,125.0	99.0	0.25	0.2	
1411	1410	5	1,125.0	900.0	358.0			
1411	1410	8				0.25	4.24	
1410	14.1	4	900.0	750.0	630.0			EX. 24" CSP Caltrans
								Storm Drain
							4.44	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS -EXISTING HYDROLOGY                                  *
* SUBBASIN # 141                                                         *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR141.DAT
  TIME/DATE OF STUDY: 12:53 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1412.00 TO NODE   1411.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    99.00
  UPSTREAM ELEVATION(FEET) =   1175.00
  DOWNSTREAM ELEVATION(FEET) =   1125.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.067
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.377
 SUBAREA RUNOFF(CFS) =      0.37
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
 FLOW PROCESS FROM NODE   1411.00 TO NODE   1410.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =    900.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   358.00   CHANNEL SLOPE =  0.6285
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2300 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.37
 FLOW VELOCITY(FEET/SEC) =   2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   9.29
 LONGEST FLOWPATH FROM NODE   1412.00 TO NODE   1410.00 =   457.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1411.00 TO NODE   1410.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.185
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    4.24   SUBAREA RUNOFF(CFS) =    6.56
 TOTAL AREA(ACRES) =      4.44   TOTAL RUNOFF(CFS) =    6.87
 TC(MIN.) =   9.29

****************************************************************************
 FLOW PROCESS FROM NODE   1410.00 TO NODE     14.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   900.00  DOWNSTREAM(FEET) =   750.00
 FLOW LENGTH(FEET) =   630.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.21
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      6.87
 PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =  10.15
 LONGEST FLOWPATH FROM NODE   1412.00 TO NODE     14.10 =  1087.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      4.44  TC(MIN.) =     10.15
 PEAK FLOW RATE(CFS)   =      6.87
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR14

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1403	1402	2	1,075.0	1,030.0	85.0	0.25	0.14	
1402	1401	5	1,030.0	835.0	340.0			
1402	1401	8				0.25	3.79	
1401	14	4	835.0	720.0	615.0			EX. 24" CSP Caltrans
								Storm Drain
							3.93	Total Area

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 14                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR14.DAT
  TIME/DATE OF STUDY: 12:49 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1403.00 TO NODE   1402.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =   1030.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.548
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.749
 SUBAREA RUNOFF(CFS) =      0.27
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
 FLOW PROCESS FROM NODE   1402.00 TO NODE   1401.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    835.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00   CHANNEL SLOPE =  0.5735
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2287 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.27
 FLOW VELOCITY(FEET/SEC) =   2.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =   8.66
 LONGEST FLOWPATH FROM NODE   1403.00 TO NODE   1401.00 =   425.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1402.00 TO NODE   1401.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.469
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    3.79   SUBAREA RUNOFF(CFS) =    6.13
 TOTAL AREA(ACRES) =      3.93   TOTAL RUNOFF(CFS) =    6.36
 TC(MIN.) =   8.66

****************************************************************************
 FLOW PROCESS FROM NODE   1401.00 TO NODE     14.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   835.00  DOWNSTREAM(FEET) =   720.00
 FLOW LENGTH(FEET) =   615.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.95
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      6.36
 PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   9.60
 LONGEST FLOWPATH FROM NODE   1403.00 TO NODE     14.00 =  1040.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      3.93  TC(MIN.) =      9.60
 PEAK FLOW RATE(CFS)   =      6.36
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR151

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1512	1511	2	1,245.0	1,230.0	100.0	0.25	0.14	
1511	1510	5	1,230.0	908.0	920.0			
1511	1510	8				0.25	6.7	
1510	15.1	4	908.0	834.0	360.0			Ex. 24" CSP/RCP
							6.84	Total Area

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Job #:
2469.01A

Date:
October 2006

Run Name:
MERR151
Page 2

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Date:
October 2006

Job #:
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Run Name:
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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Date:
October 2006

Job #:
2469.01A

Run Name:
MERR151

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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                              Analysis prepared by:

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                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 151                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR151.DAT
  TIME/DATE OF STUDY: 12:55 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1512.00 TO NODE   1511.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1245.00
  DOWNSTREAM ELEVATION(FEET) =   1230.00
  ELEVATION DIFFERENCE(FEET) =    15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.26
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
 FLOW PROCESS FROM NODE   1511.00 TO NODE   1510.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =    908.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   920.00   CHANNEL SLOPE =  0.3500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2052 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.26
 FLOW VELOCITY(FEET/SEC) =   2.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.04   Tc(MIN.) =  13.15
 LONGEST FLOWPATH FROM NODE   1512.00 TO NODE   1510.00 =  1020.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1511.00 TO NODE   1510.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.943
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    6.70   SUBAREA RUNOFF(CFS) =    8.28
 TOTAL AREA(ACRES) =      6.84   TOTAL RUNOFF(CFS) =    8.45
 TC(MIN.) =  13.15

****************************************************************************
 FLOW PROCESS FROM NODE   1510.00 TO NODE     15.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   908.00  DOWNSTREAM(FEET) =   834.00
 FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.18
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      8.45
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  13.50
 LONGEST FLOWPATH FROM NODE   1512.00 TO NODE     15.10 =  1380.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      6.84  TC(MIN.) =     13.50
 PEAK FLOW RATE(CFS)   =      8.45
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR15

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1509	1508	2	1,535.0	1,500.0	75.0	0.25	0.21	
1508	1507	5	1,500.0	1,335.0	500.0			
1508	1507	8				0.25	1.77	
1507	1506	5	1,335.0	1,135.0	400.0			
1507	1506	8				0.25	8.61	
1506	1505	5	1,135.0	904.0	960.0			
1506	1505	8				0.25	19.77	
1505	1504	4	904.0	857.0	220.0			Ex. 36" CSP/RCP
1504	1504	1						1 of 2
1504.3	1504.2	2	1,225.0	1,195.0	100.0	0.25	0.15	
1504.2	1504.1	5	1,195.0	891.0	1,070.0			
1504.2	1504.1	8				0.25	5.31	
1504.1	1504	4	891.0	857.0	574.0			Ex. 24" CSP/RCP
1504	1504	1						2 of 2
1504	1500	4	857.0	846.0	234.0			Ex. 42" CSP
1500	1500	1						1 of 2
1503	1502	2	1,310.0	1,280.0	100.0	0.25	0.17	
1502	1501	5	1,280.0	902.0	890.0			
1502	1501	8				0.25	7.31	
1501	1500	4	902.0	846.0	344.0			Ex. 24" CSP/RCP
1500	1500	1						2 of 2
1500	15	4	846.0	791.0	162.0			Ex. 48" CSP
							43.3	Total Area

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR15

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR15
Page 3

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR15

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

```
**************************************************************************

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                              Analysis prepared by:

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                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 15                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR15.DAT
  TIME/DATE OF STUDY: 12:51 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1509.00 TO NODE   1508.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1535.00
  DOWNSTREAM ELEVATION(FEET) =   1500.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
 SUBAREA RUNOFF(CFS) =      0.42
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
 FLOW PROCESS FROM NODE   1508.00 TO NODE   1507.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1335.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00   CHANNEL SLOPE =  0.3300
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2018 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.42
 FLOW VELOCITY(FEET/SEC) =   2.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.31   Tc(MIN.) =   9.46
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1507.00 =   575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1508.00 TO NODE   1507.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.111
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    1.77   SUBAREA RUNOFF(CFS) =    2.70
 TOTAL AREA(ACRES) =      1.98   TOTAL RUNOFF(CFS) =    3.02
 TC(MIN.) =   9.46

****************************************************************************
 FLOW PROCESS FROM NODE   1507.00 TO NODE   1506.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1335.00  DOWNSTREAM(FEET) =   1135.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.5000
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2250 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.02
 FLOW VELOCITY(FEET/SEC) =   3.84 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.74   Tc(MIN.) =  11.20
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1506.00 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1507.00 TO NODE   1506.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.482
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    8.61   SUBAREA RUNOFF(CFS) =   11.80
 TOTAL AREA(ACRES) =     10.59   TOTAL RUNOFF(CFS) =   14.51
 TC(MIN.) =  11.20
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1506.00 TO NODE   1505.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    904.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   960.00   CHANNEL SLOPE =  0.2406
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1769 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     14.51
  FLOW VELOCITY(FEET/SEC) =   5.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =  13.99
  LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1505.00 =  1935.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1506.00 TO NODE   1505.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.749
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   19.77   SUBAREA RUNOFF(CFS) =   23.47
  TOTAL AREA(ACRES) =     30.36   TOTAL RUNOFF(CFS) =   36.05
  TC(MIN.) =  13.99

****************************************************************************
  FLOW PROCESS FROM NODE   1505.00 TO NODE   1504.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   904.00  DOWNSTREAM(FEET) =   857.00
  FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  11.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.15
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     36.05
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =  14.19
  LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1504.00 =  2155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1504.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.19
  RAINFALL INTENSITY(INCH/HR) =   4.71
  TOTAL STREAM AREA(ACRES) =    30.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.05

****************************************************************************
  FLOW PROCESS FROM NODE   1504.30 TO NODE   1504.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1225.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE   1504.20 TO NODE   1504.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    891.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00   CHANNEL SLOPE =  0.2841
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1910 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.28
  FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.29   Tc(MIN.) =  14.39
  LONGEST FLOWPATH FROM NODE   1504.30 TO NODE   1504.10 =  1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1504.20 TO NODE   1504.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.664
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    5.31   SUBAREA RUNOFF(CFS) =    6.19
  TOTAL AREA(ACRES) =      5.46   TOTAL RUNOFF(CFS) =    6.37
  TC(MIN.) =  14.39

****************************************************************************
  FLOW PROCESS FROM NODE   1504.10 TO NODE   1504.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   891.00  DOWNSTREAM(FEET) =   857.00
  FLOW LENGTH(FEET) =   574.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.18
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      6.37
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =  15.33
  LONGEST FLOWPATH FROM NODE   1504.30 TO NODE   1504.00 =  1744.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1504.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.33
 RAINFALL INTENSITY(INCH/HR) =   4.48
 TOTAL STREAM AREA(ACRES) =     5.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.37

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       36.05    14.19        4.706         30.36
     2        6.37    15.33        4.477          5.46

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       41.94    14.19       4.706
     2       40.66    15.33       4.477

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     41.94   Tc(MIN.) =   14.19
 TOTAL AREA(ACRES) =     35.82
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1504.00 =  2155.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1504.00 TO NODE   1500.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   857.00  DOWNSTREAM(FEET) =   846.00
 FLOW LENGTH(FEET) =   234.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  17.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.81
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     41.94
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =  14.55
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1500.00 =  2389.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1500.00 TO NODE   1500.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.55
 RAINFALL INTENSITY(INCH/HR) =   4.63
 TOTAL STREAM AREA(ACRES) =    35.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.94

****************************************************************************
 FLOW PROCESS FROM NODE   1503.00 TO NODE   1502.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1310.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1280.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =    902.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   890.00   CHANNEL SLOPE =  0.4247
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2170 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.31
  FLOW VELOCITY(FEET/SEC) =   2.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.69   Tc(MIN.) =  12.79
  LONGEST FLOWPATH FROM NODE   1503.00 TO NODE   1501.00 =   990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.032
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    7.31   SUBAREA RUNOFF(CFS) =    9.20
  TOTAL AREA(ACRES) =      7.48   TOTAL RUNOFF(CFS) =    9.41
  TC(MIN.) =  12.79

****************************************************************************
  FLOW PROCESS FROM NODE   1501.00 TO NODE   1500.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   902.00  DOWNSTREAM(FEET) =   846.00
  FLOW LENGTH(FEET) =   344.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.31
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      9.41
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  13.14
  LONGEST FLOWPATH FROM NODE   1503.00 TO NODE   1500.00 =  1334.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1500.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.14
  RAINFALL INTENSITY(INCH/HR) =   4.94
```

```
  TOTAL STREAM AREA(ACRES) =     7.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       41.94    14.55        4.630         35.82
      2        9.41    13.14        4.945          7.48

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       48.68    13.14       4.945
      2       50.75    14.55       4.630

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     50.75   Tc(MIN.) =   14.55
  TOTAL AREA(ACRES) =     43.30
  LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1500.00 =  2389.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE     15.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   846.00  DOWNSTREAM(FEET) =   791.00
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.97
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     50.75
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =  14.67
  LONGEST FLOWPATH FROM NODE   1509.00 TO NODE     15.00 =  2551.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     43.30  TC(MIN.) =     14.67
  PEAK FLOW RATE(CFS)   =     50.75
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR16

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1603	1602.8	2	1,580.0	1,565.0	75.0	0.35	0.44	
1602.8	1602.6	5	1,565.0	1,325.0	515.0			
1602.8	1602.6	8				0.30	4.58	
1602.6	1602	5	1,325.0	1,210.0	605.0			
1602.6	1602	8				0.27	12.87	
1602	1601	5	1,210.0	950.0	850.0			
1602	1601	8				0.26	11.7	
1601	16	4	950.0	850.0	605.0			Ex. 42" CSP/RCP
							29.59	Total Area

```
**************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC.
                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN #16 - NO DETENTION ROUTING                                     *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR16.DAT
  TIME/DATE OF STUDY: 14:17 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1602.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1580.00
  DOWNSTREAM ELEVATION(FEET) =   1565.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      1.35
 TOTAL AREA(ACRES) =      0.44   TOTAL RUNOFF(CFS) =      1.35

****************************************************************************
 FLOW PROCESS FROM NODE    1602.80 TO NODE    1602.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1565.00  DOWNSTREAM(FEET) =   1325.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.4660
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2216 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.35
 FLOW VELOCITY(FEET/SEC) =   2.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.95   Tc(MIN.) =   8.38
 LONGEST FLOWPATH FROM NODE    1603.00 TO NODE    1602.60 =    590.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    1602.80 TO NODE    1602.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.611
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3044
 SUBAREA AREA(ACRES) =     4.58   SUBAREA RUNOFF(CFS) =     9.08
 TOTAL AREA(ACRES) =      5.02   TOTAL RUNOFF(CFS) =    10.10
 TC(MIN.) =   8.38

****************************************************************************
 FLOW PROCESS FROM NODE    1602.60 TO NODE    1602.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1325.00  DOWNSTREAM(FEET) =   1210.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   605.00   CHANNEL SLOPE =  0.1901
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1550 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     10.10
 FLOW VELOCITY(FEET/SEC) =   4.76 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =  10.49
 LONGEST FLOWPATH FROM NODE    1603.00 TO NODE    1602.00 =   1195.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    1602.60 TO NODE    1602.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.717
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2796
 SUBAREA AREA(ACRES) =    12.87   SUBAREA RUNOFF(CFS) =    19.87
 TOTAL AREA(ACRES) =     17.89   TOTAL RUNOFF(CFS) =    28.60
 TC(MIN.) =  10.49

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    1602.00 TO NODE    1601.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    1210.00  DOWNSTREAM(FEET) =     950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =    850.00   CHANNEL SLOPE =  0.3059
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1965 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      28.60
 FLOW VELOCITY(FEET/SEC) =    7.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =    1.87   Tc(MIN.) =  12.36
 LONGEST FLOWPATH FROM NODE    1603.00 TO NODE    1601.00 =  2045.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    1602.00 TO NODE    1601.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.144
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =    0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2719
 SUBAREA AREA(ACRES) =    11.70   SUBAREA RUNOFF(CFS) =    15.65
 TOTAL AREA(ACRES) =      29.59   TOTAL RUNOFF(CFS) =    41.38
 TC(MIN.) =  12.36

****************************************************************************
 FLOW PROCESS FROM NODE    1601.00 TO NODE      16.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     950.00  DOWNSTREAM(FEET) =     850.00
 FLOW LENGTH(FEET) =    605.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  42.0 INCH PIPE IS    9.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.74
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =    1
 PIPE-FLOW(CFS) =      41.38
 PIPE TRAVEL TIME(MIN.) =    0.42    Tc(MIN.) =  12.79
 LONGEST FLOWPATH FROM NODE    1603.00 TO NODE      16.00 =  2650.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      29.59  TC(MIN.) =      12.79
 PEAK FLOW RATE(CFS)    =      41.38
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/28/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 13 MIN.
6 [illegible]R RAINFALL 3.5 INCHES
B[illegible]AREA 29.59 ACRES
RUNOFF COEFFICIENT 0.2719
PEAK DISCHARGE 41.38 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 13	DISCHARGE (CFS) = 0
TIME (MIN) = 26	DISCHARGE (CFS) = 1.7
TIME (MIN) = 39	DISCHARGE (CFS) = 1.8
TIME (MIN) = 52	DISCHARGE (CFS) = 1.9
TIME (MIN) = 65	DISCHARGE (CFS) = 1.9
TIME (MIN) = 78	DISCHARGE (CFS) = 2
TIME (MIN) = 91	DISCHARGE (CFS) = 2.1
TIME (MIN) = 104	DISCHARGE (CFS) = 2.2
TIME (MIN) = 117	DISCHARGE (CFS) = 2.3
TIME (MIN) = 130	DISCHARGE (CFS) = 2.5
TIME (MIN) = 143	DISCHARGE (CFS) = 2.7
TIME (MIN) = 156	DISCHARGE (CFS) = 2.9
TIME (MIN) = 169	DISCHARGE (CFS) = 3.1
TIME (MIN) = 182	DISCHARGE (CFS) = 3.6
TIME (MIN) = 195	DISCHARGE (CFS) = 3.9
TIME (MIN) = 208	DISCHARGE (CFS) = 4.7
TIME (MIN) = 221	DISCHARGE (CFS) = 5.4
TIME (MIN) = 234	DISCHARGE (CFS) = 7.9
TIME (MIN) = 247	DISCHARGE (CFS) = 9.9
TIME (MIN) = 260	DISCHARGE (CFS) = 41.38
TIME (MIN) = 273	DISCHARGE (CFS) = 6.4
TIME (MIN) = 286	DISCHARGE (CFS) = 4.3
TIME (MIN) = 299	DISCHARGE (CFS) = 3.3
TIME (MIN) = 312	DISCHARGE (CFS) = 2.8
TIME (MIN) = 325	DISCHARGE (CFS) = 2.4
TIME (MIN) = 338	DISCHARGE (CFS) = 2.2
TIME (MIN) = 351	DISCHARGE (CFS) = 2
TIME (MIN) = 364	DISCHARGE (CFS) = 1.8
TIME (MIN) = 377	DISCHARGE (CFS) = 0

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR17

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1702	1701.8	2	1,355.0	1,320.0	75.0	0.35	0.11	
1701.8	1701.6	5	1,320.0	1,120.0	325.0			
1701.8	1701.6	8				0.28	1.78	
1701.6	1701	5	1,120.0	950.0	760.0			
1701.6	1701	8				0.26	12.38	
1701	17	4	950.0	900.0	440.0			EX. 30" CSP Caltrans
								Storm Drain
							14.27	Total Area

```
**************************************************************************

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                              Analysis prepared by:

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                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 17                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR17.DAT
  TIME/DATE OF STUDY: 12:58 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1702.00 TO NODE   1701.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1355.00
  DOWNSTREAM ELEVATION(FEET) =   1320.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.34
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
 FLOW PROCESS FROM NODE   1701.80 TO NODE   1701.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1320.00  DOWNSTREAM(FEET) =   1120.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   325.00   CHANNEL SLOPE =  0.6154
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2300 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.34
 FLOW VELOCITY(FEET/SEC) =   2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =   7.44
 LONGEST FLOWPATH FROM NODE   1702.00 TO NODE   1701.60 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1701.80 TO NODE   1701.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.134
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2780
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2822
 SUBAREA AREA(ACRES) =    1.78   SUBAREA RUNOFF(CFS) =    3.53
 TOTAL AREA(ACRES) =      1.89   TOTAL RUNOFF(CFS) =    3.80
 TC(MIN.) =   7.44

****************************************************************************
 FLOW PROCESS FROM NODE   1701.60 TO NODE   1701.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1120.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   760.00   CHANNEL SLOPE =  0.2237
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1712 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.80
 FLOW VELOCITY(FEET/SEC) =   3.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.50   Tc(MIN.) =  10.95
 LONGEST FLOWPATH FROM NODE   1702.00 TO NODE   1701.00 =  1160.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1701.60 TO NODE   1701.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.563
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2629
 SUBAREA AREA(ACRES) =   12.38   SUBAREA RUNOFF(CFS) =   17.91
 TOTAL AREA(ACRES) =     14.27   TOTAL RUNOFF(CFS) =   20.87
 TC(MIN.) =  10.95
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE   1701.00 TO NODE     17.00 IS CODE =  41
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   900.00
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.58
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     20.87
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =  11.53
  LONGEST FLOWPATH FROM NODE   1702.00 TO NODE     17.00 =  1600.00 FEET.
===============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     14.27  TC(MIN.) =     11.53
  PEAK FLOW RATE(CFS)   =     20.87
===============================================================================
===============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR18

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1802	1801.5	2	1,370.0	1,365.0	88.0	0.35	0.15	
1801.5	1801	5	1,365.0	950.0	970.0			
1801.5	1801	8				0.26	6.35	
1801	18	4	950.0	925.0	440.0			EX. 24" Caltrans
								Storm Drain
							6.5	Total Area

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Date:
October 2006

Job #:
2469.01A

Run Name:
MERR18

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Job Name:
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Date:
October 2006

Job #:
2469.01A

Run Name:
MERR18

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Job Name:
Merriam Mountains - Existing Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MERR18

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

```
**************************************************************************

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                              Analysis prepared by:

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                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 18                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR18.DAT
  TIME/DATE OF STUDY: 13:00 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1802.00 TO NODE   1801.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    88.00
  UPSTREAM ELEVATION(FEET) =   1370.00
  DOWNSTREAM ELEVATION(FEET) =   1365.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.097
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.357
```

```
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE   1801.50 TO NODE   1801.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   970.00   CHANNEL SLOPE =  0.4278
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2173 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.39
  FLOW VELOCITY(FEET/SEC) =   2.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.19   Tc(MIN.) =  13.29
  LONGEST FLOWPATH FROM NODE   1802.00 TO NODE   1801.00 =  1058.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1801.50 TO NODE   1801.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.909
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2621
  SUBAREA AREA(ACRES) =    6.35   SUBAREA RUNOFF(CFS) =    8.10
  TOTAL AREA(ACRES) =      6.50   TOTAL RUNOFF(CFS) =    8.36
  TC(MIN.) =  13.29

****************************************************************************
  FLOW PROCESS FROM NODE   1801.00 TO NODE     18.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   925.00
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.99
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      8.36
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =  13.90
  LONGEST FLOWPATH FROM NODE   1802.00 TO NODE     18.00 =  1498.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      6.50  TC(MIN.) =     13.90
  PEAK FLOW RATE(CFS)   =      8.36
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR19

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1903	1902.8	2	1,595.0	1,530.0	75.0	0.35	0.14	
1902.8	1902.6	5	1,530.0	1,420.0	300.0			
1902.8	1902.6	8				0.35	1.04	
1902.6	1902.4	5	1,420.0	1,245.0	600.0			
1902.6	1902.4	8				0.35	9.05	
1902.4	1902	5	1,245.0	1,090.0	1,145.0			
1902.4	1902	8				0.315	28.68	
1902	1901	5	1,090.0	950.0	1,950.0			
1902	1901	8				0.267	42.31	
1901	19	4	950.0	930.0	441.0			Ex. 60" RCP Caltrans
								Storm Drain
							81.22	Total Area

```
**************************************************************************

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                              Analysis prepared by:

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                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN #19                                                            *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR19.DAT
  TIME/DATE OF STUDY: 15:06 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-   CROWN TO    STREET-CROSSFALL:    CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-   HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)     SIDE / SIDE/ WAY     (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ==================  ======  ===== ======  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1903.00 TO NODE   1902.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1595.00
  DOWNSTREAM ELEVATION(FEET) =   1530.00
  ELEVATION DIFFERENCE(FEET) =     65.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.43
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
 FLOW PROCESS FROM NODE   1902.80 TO NODE   1902.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1530.00  DOWNSTREAM(FEET) =   1420.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.3667
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2082 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.43
 FLOW VELOCITY(FEET/SEC) =   2.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   7.38
 LONGEST FLOWPATH FROM NODE   1903.00 TO NODE   1902.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1902.80 TO NODE   1902.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.171
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     1.04   SUBAREA RUNOFF(CFS) =    2.61
 TOTAL AREA(ACRES) =      1.18   TOTAL RUNOFF(CFS) =    2.96
 TC(MIN.) =   7.38

****************************************************************************
 FLOW PROCESS FROM NODE   1902.60 TO NODE   1902.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1420.00  DOWNSTREAM(FEET) =   1245.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.2917
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1929 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.96
 FLOW VELOCITY(FEET/SEC) =   3.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.83   Tc(MIN.) =  10.22
 LONGEST FLOWPATH FROM NODE   1903.00 TO NODE   1902.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1902.60 TO NODE   1902.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.816
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     9.05   SUBAREA RUNOFF(CFS) =   18.42
 TOTAL AREA(ACRES) =     10.23   TOTAL RUNOFF(CFS) =   20.83
 TC(MIN.) =  10.22
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   1902.40 TO NODE   1902.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1245.00  DOWNSTREAM(FEET) =   1090.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1145.00   CHANNEL SLOPE =  0.1354
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1252 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     20.83
 FLOW VELOCITY(FEET/SEC) =   5.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.50   Tc(MIN.) =  13.72
 LONGEST FLOWPATH FROM NODE   1903.00 TO NODE   1902.00 =  2120.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   1902.40 TO NODE   1902.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.809
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3150
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3242
 SUBAREA AREA(ACRES) =   28.68   SUBAREA RUNOFF(CFS) =   43.45
 TOTAL AREA(ACRES) =     38.91   TOTAL RUNOFF(CFS) =   60.66
 TC(MIN.) =  13.72

**************************************************************************
 FLOW PROCESS FROM NODE   1902.00 TO NODE   1901.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1090.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1950.00   CHANNEL SLOPE =  0.0718
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0718 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     60.66
 FLOW VELOCITY(FEET/SEC) =   5.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.52   Tc(MIN.) =  19.24
 LONGEST FLOWPATH FROM NODE   1903.00 TO NODE   1901.00 =  4070.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   1902.00 TO NODE   1901.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.867
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2670
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2944
 SUBAREA AREA(ACRES) =   42.31   SUBAREA RUNOFF(CFS) =   43.68
 TOTAL AREA(ACRES) =     81.22   TOTAL RUNOFF(CFS) =   92.46
 TC(MIN.) =  19.24

**************************************************************************
 FLOW PROCESS FROM NODE   1901.00 TO NODE     19.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   930.00
  FLOW LENGTH(FEET) =   441.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  17.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.13
  GIVEN PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     92.46
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =  19.60
  LONGEST FLOWPATH FROM NODE   1903.00 TO NODE     19.00 =  4511.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     81.22  TC(MIN.) =     19.60
  PEAK FLOW RATE(CFS)   =     92.46
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/29/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 20 MIN.
6 H[illegible]R RAINFALL 3.5 INCHES
BA[illegible]REA 81.22 ACRES
RUNOFF COEFFICIENT 0.2944
PEAK DISCHARGE 92.46 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 20	DISCHARGE (CFS) = 5.1
TIME (MIN) = 40	DISCHARGE (CFS) = 5.2
TIME (MIN) = 60	DISCHARGE (CFS) = 5.7
TIME (MIN) = 80	DISCHARGE (CFS) = 6
TIME (MIN) = 100	DISCHARGE (CFS) = 6.6
TIME (MIN) = 120	DISCHARGE (CFS) = 7
TIME (MIN) = 140	DISCHARGE (CFS) = 8.1
TIME (MIN) = 160	DISCHARGE (CFS) = 8.7
TIME (MIN) = 180	DISCHARGE (CFS) = 10.7
TIME (MIN) = 200	DISCHARGE (CFS) = 12.2
TIME (MIN) = 220	DISCHARGE (CFS) = 17.9
TIME (MIN) = 240	DISCHARGE (CFS) = 22.9
TIME (MIN) = 260	DISCHARGE (CFS) = 92.46
TIME (MIN) = 280	DISCHARGE (CFS) = 14.3
TIME (MIN) = 300	DISCHARGE (CFS) = 9.6
TIME (MIN) = 320	DISCHARGE (CFS) = 7.5
TIME (MIN) = 340	DISCHARGE (CFS) = 6.3
TIME (MIN) = 360	DISCHARGE (CFS) = 5.5
TIME (MIN) = 380	DISCHARGE (CFS) = 0

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www.fuscoe.com

Newland Sierra

Job #: 2660-02

Run Name:
E-20.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2001	2000.8	2	1065	1055	75	0.25	0.35				
2000.8	2000.6	5	1055	1025	300						
2000.8	2000.6	8				0.3	4.54				
2000.6	2000	5	1025	985	475						
2000.6	2000	8				0.35	7.37				
2000	20.2	4	986.5	969.1	300			EX 30" CSP CALTRANS			
20.2	20.1	4						EX 42" CSP CALTRANS			
20.1	20.1	1	968.6	958	532						
2004	2003	2	1050	1045	75	0.35	0.10				
2003	2002	5	1045	973	450						
2003	2002	8				0.3	1.92				
2002	20.1	4	966.9	958.8	198			EX 24" CSP CALTRANS			
20.1	20.1	1									
20.1	20	4	957	944.8	200			EX 42" CSP CALTRANS			

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2012 Advanced Engineering Software (aes)
              Ver. 19.0 Release Date: 06/01/2012  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                                6390 Greenwich Dr.
                                    Suite 170
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* EXISTING HYDROLOGY                                                      *
* SUBBASIN #20                                                            *
* SEPTEMBER 2014                                                          *
 *************************************************************************

  FILE NAME: E-20.DAT
  TIME/DATE OF STUDY: 10:33 09/24/2014
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2000.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1065.00
  DOWNSTREAM ELEVATION(FEET) =   1055.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
 SUBAREA RUNOFF(CFS) =      0.71
 TOTAL AREA(ACRES) =      0.35   TOTAL RUNOFF(CFS) =      0.71

****************************************************************************
 FLOW PROCESS FROM NODE   2000.80 TO NODE   2000.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =   1025.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.71
 FLOW VELOCITY(FEET/SEC) =   1.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =    8.97
 LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2000.60 =     375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2000.80 TO NODE   2000.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.324
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2964
 SUBAREA AREA(ACRES) =    4.54   SUBAREA RUNOFF(CFS) =    8.61
 TOTAL AREA(ACRES) =        4.9   TOTAL RUNOFF(CFS) =       9.17
 TC(MIN.) =    8.97

****************************************************************************
 FLOW PROCESS FROM NODE   2000.60 TO NODE   2000.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    985.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.0842
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0842 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =       9.17
 FLOW VELOCITY(FEET/SEC) =   3.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.33   Tc(MIN.) =   11.30
 LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2000.00 =     850.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2000.60 TO NODE   2000.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.449
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3286
 SUBAREA AREA(ACRES) =    7.37   SUBAREA RUNOFF(CFS) =   14.06
 TOTAL AREA(ACRES) =       12.3   TOTAL RUNOFF(CFS) =      21.95
 TC(MIN.) =   11.30
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE     20.20 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   986.50  DOWNSTREAM(FEET) =   969.10
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.97
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.95
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   11.81
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE     20.20 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.20 TO NODE     20.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   968.60  DOWNSTREAM(FEET) =   958.00
  FLOW LENGTH(FEET) =   532.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  15.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.64
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.95
  PIPE TRAVEL TIME(MIN.) =   1.34    Tc(MIN.) =   13.14
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE     20.10 =    1682.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.10 TO NODE     20.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.14
  RAINFALL INTENSITY(INCH/HR) =   4.94
  TOTAL STREAM AREA(ACRES) =    12.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.95

****************************************************************************
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2003.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1050.00
  DOWNSTREAM ELEVATION(FEET) =   1045.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.212
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.017
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2002.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1045.00  DOWNSTREAM(FEET) =    973.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00   CHANNEL SLOPE =  0.1600
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1400 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.28
  FLOW VELOCITY(FEET/SEC) =   2.10 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.58   Tc(MIN.) =    9.79
  LONGEST FLOWPATH FROM NODE   2004.00 TO NODE   2002.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2002.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.978
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.92   SUBAREA RUNOFF(CFS) =    4.02
  TOTAL AREA(ACRES) =        2.0   TOTAL RUNOFF(CFS) =       4.23
  TC(MIN.) =    9.79

****************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE     20.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   966.90  DOWNSTREAM(FEET) =   958.80
  FLOW LENGTH(FEET) =   198.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.67
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.23
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   10.37
  LONGEST FLOWPATH FROM NODE   2004.00 TO NODE     20.10 =     723.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.10 TO NODE     20.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.37
  RAINFALL INTENSITY(INCH/HR) =   5.76
  TOTAL STREAM AREA(ACRES) =     2.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       21.95    13.14        4.944         12.26
      2        4.23    10.37        5.759          2.02

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       21.56    10.37       5.759
      2       25.58    13.14       4.944

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      25.58   Tc(MIN.) =   13.14
  TOTAL AREA(ACRES) =       14.3
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE     20.10 =    1682.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.10 TO NODE     20.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   957.00  DOWNSTREAM(FEET) =   944.80
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  12.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.37
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.58
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   13.46
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE     20.00 =    1882.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       14.3  TC(MIN.) =     13.46
  PEAK FLOW RATE(CFS)   =      25.58
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Existing Condition

BASIN B

FUSCOE
ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

Newland Sierra

Job #: 2660-02

Run Name:

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2101	2100.8	2	1,235.0	1,215.0	75.0	0.3	0.11				
2100.8	2100.6	5	1,215.0	1,105.0	300.0						
2100.8	2100.6	8				0.26	1.52				
2100.6	2100.4	5	1,105.0	1,045.0	600.0						
2100.6	2100.4	8				0.28	5.09				
2100.4	21	5	1,045.0	1,000.0	1,175.0						
2100.4	21	8				0.32	29.11				
							35.83				

```
**************************************************************************

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                              Analysis prepared by:

                                Fuscoe Engineering
                                6390 Greenwich Dr.
                                    Suite 170
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* EXISTING HYDROLOGY                                                      *
* SUBBASIN 21                                                             *
*                                                                         *
 *************************************************************************

  FILE NAME: E-21.DAT
  TIME/DATE OF STUDY: 16:36 09/24/2014
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2100.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1235.00
  DOWNSTREAM ELEVATION(FEET) =   1215.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.789
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.390
 SUBAREA RUNOFF(CFS) =      0.28
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
 FLOW PROCESS FROM NODE   2100.80 TO NODE   2100.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1215.00  DOWNSTREAM(FEET) =   1105.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.3667
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2082 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.28
 FLOW VELOCITY(FEET/SEC) =   2.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =    7.75
 LONGEST FLOWPATH FROM NODE   2101.00 TO NODE   2100.60 =     375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2100.80 TO NODE   2100.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.953
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2627
 SUBAREA AREA(ACRES) =    1.52   SUBAREA RUNOFF(CFS) =    2.75
 TOTAL AREA(ACRES) =        1.6   TOTAL RUNOFF(CFS) =       2.98
 TC(MIN.) =    7.75

****************************************************************************
 FLOW PROCESS FROM NODE   2100.60 TO NODE   2100.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =   1045.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1000
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =       2.98
 FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.93   Tc(MIN.) =   11.67
 LONGEST FLOWPATH FROM NODE   2101.00 TO NODE   2100.40 =     975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2100.60 TO NODE   2100.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.337
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2758
 SUBAREA AREA(ACRES) =    5.09   SUBAREA RUNOFF(CFS) =    7.61
 TOTAL AREA(ACRES) =        6.7   TOTAL RUNOFF(CFS) =       9.89
 TC(MIN.) =   11.67
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2100.40 TO NODE     21.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1045.00  DOWNSTREAM(FEET) =   1000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.0383
  CHANNEL FLOW THRU SUBAREA(CFS) =       9.89
  FLOW VELOCITY(FEET/SEC) =   2.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.33   Tc(MIN.) =   20.00
  LONGEST FLOWPATH FROM NODE   2101.00 TO NODE     21.00 =    2150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2100.40 TO NODE     21.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.771
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3117
  SUBAREA AREA(ACRES) =   29.11   SUBAREA RUNOFF(CFS) =   35.13
  TOTAL AREA(ACRES) =       35.8   TOTAL RUNOFF(CFS) =      42.11
  TC(MIN.) =   20.00
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       35.8  TC(MIN.) =     20.00
  PEAK FLOW RATE(CFS)   =      42.11
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR221

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2213	2212	2	1,260.0	1,230.0	100.0	0.35	0.47	
2212	2211	5	1,230.0	1,095.0	647.9			
2212	2211	8				0.46	3.03	
2211	2210	5	1,095.0	843.4	880.3			
2211	2210	8				0.44	8.57	
2210	22.1	4	831.0	827.0	50.0			Ex. 24" CMP
								Storm Drain
							12.07	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 221                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR221.DAT
  TIME/DATE OF STUDY: 13:05 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2213.00 TO NODE   2212.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1260.00
  DOWNSTREAM ELEVATION(FEET) =   1230.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      1.31
 TOTAL AREA(ACRES) =      0.47   TOTAL RUNOFF(CFS) =      1.31

****************************************************************************
 FLOW PROCESS FROM NODE   2212.00 TO NODE   2211.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1095.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.90   CHANNEL SLOPE =  0.2084
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1642 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.31
 FLOW VELOCITY(FEET/SEC) =   2.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.35   Tc(MIN.) =  10.61
 LONGEST FLOWPATH FROM NODE   2213.00 TO NODE   2211.00 =   747.90 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2212.00 TO NODE   2211.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.675
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4452
 SUBAREA AREA(ACRES) =    3.03   SUBAREA RUNOFF(CFS) =    7.91
 TOTAL AREA(ACRES) =      3.50   TOTAL RUNOFF(CFS) =    8.84
 TC(MIN.) =  10.61

****************************************************************************
 FLOW PROCESS FROM NODE   2211.00 TO NODE   2210.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1095.00  DOWNSTREAM(FEET) =    843.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =   880.30   CHANNEL SLOPE =  0.2858
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1915 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.84
 FLOW VELOCITY(FEET/SEC) =   5.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.90   Tc(MIN.) =  13.51
 LONGEST FLOWPATH FROM NODE   2213.00 TO NODE   2210.00 =  1628.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2211.00 TO NODE   2210.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.856
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4430
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4436
 SUBAREA AREA(ACRES) =    8.57   SUBAREA RUNOFF(CFS) =   18.44
 TOTAL AREA(ACRES) =     12.07   TOTAL RUNOFF(CFS) =   26.01
 TC(MIN.) =  13.51

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2210.00 TO NODE     22.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   831.00  DOWNSTREAM(FEET) =   827.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.60
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     26.01
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =  13.58
  LONGEST FLOWPATH FROM NODE   2213.00 TO NODE     22.10 =  1678.20 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     12.07  TC(MIN.) =     13.58
  PEAK FLOW RATE(CFS)   =     26.01
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR222

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2223	2222	2	1,260.0	1,210.0	92.1	0.35	0.23	
2222	2221	5	1,210.0	1,115.0	382.1			
2222	2221	8				0.45	5.99	
2221	2220	5	1,115.0	885.0	797.9			
2221	2220	8				0.45	7.16	
2220	22.2	4	885.0	845.0	235.0			EX. 24" CMP
								Storm Drain
							13.38	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 222                                                         *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR222.DAT
  TIME/DATE OF STUDY: 13:06 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  5.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2223.00 TO NODE   2222.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    92.10
  UPSTREAM ELEVATION(FEET) =   1260.00
  DOWNSTREAM ELEVATION(FEET) =   1210.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.014
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.186
 SUBAREA RUNOFF(CFS) =      0.66
 TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
 FLOW PROCESS FROM NODE   2222.00 TO NODE   2221.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1210.00  DOWNSTREAM(FEET) =   1115.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   382.10   CHANNEL SLOPE =  0.2486
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1795 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.66
 FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.68   Tc(MIN.) =   8.70
 LONGEST FLOWPATH FROM NODE   2223.00 TO NODE   2221.00 =   474.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2222.00 TO NODE   2221.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.452
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4540
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4502
 SUBAREA AREA(ACRES) =    5.99   SUBAREA RUNOFF(CFS) =   17.55
 TOTAL AREA(ACRES) =      6.22   TOTAL RUNOFF(CFS) =   18.07
 TC(MIN.) =   8.70

****************************************************************************
 FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1115.00  DOWNSTREAM(FEET) =    885.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   797.90   CHANNEL SLOPE =  0.2883
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1921 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     18.07
 FLOW VELOCITY(FEET/SEC) =   6.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =  10.76
 LONGEST FLOWPATH FROM NODE   2223.00 TO NODE   2220.00 =  1272.10 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.623
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4490
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4495
 SUBAREA AREA(ACRES) =    7.16   SUBAREA RUNOFF(CFS) =   18.08
 TOTAL AREA(ACRES) =     13.38   TOTAL RUNOFF(CFS) =   33.82
 TC(MIN.) =  10.76
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2220.00 TO NODE     22.20 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   885.00  DOWNSTREAM(FEET) =   845.00
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.55
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     33.82
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =  11.00
  LONGEST FLOWPATH FROM NODE   2223.00 TO NODE     22.20 =  1507.10 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     13.38  TC(MIN.) =     11.00
  PEAK FLOW RATE(CFS)   =     33.82
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR223

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments
2232	2231	2	1,240.0	1,195.0	100.0	0.35	0.26	
2231	2230	5	1,195.0	895.0	628.0			
2231	2230	8				0.45	4.67	
2230	22.3	4	895.0	888.9	40.0			EX. 24" Caltrans
								Storm Drain
							4.93	Total Area

```
**************************************************************************

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                              Analysis prepared by:

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                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 223                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR223.DAT
  TIME/DATE OF STUDY: 13:07 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2232.00 TO NODE   2231.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1240.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =    45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.73
 TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
 FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    895.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   628.00   CHANNEL SLOPE =  0.4777
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2228 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.73
 FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.96   Tc(MIN.) =  10.23
 LONGEST FLOWPATH FROM NODE   2232.00 TO NODE   2230.00 =   728.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.813
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4490
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4438
 SUBAREA AREA(ACRES) =    4.67   SUBAREA RUNOFF(CFS) =   12.19
 TOTAL AREA(ACRES) =      4.93   TOTAL RUNOFF(CFS) =   12.72
 TC(MIN.) =  10.23

****************************************************************************
 FLOW PROCESS FROM NODE   2230.00 TO NODE     22.30 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   895.00  DOWNSTREAM(FEET) =   888.90
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   8.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.40
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     12.72
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =  10.28
 LONGEST FLOWPATH FROM NODE   2232.00 TO NODE     22.30 =   768.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      4.93  TC(MIN.) =     10.28
 PEAK FLOW RATE(CFS)   =     12.72
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR224

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2242	2241	2	1,205.0	1,135.0	100.0	0.35	0.15	
2241	2240	5	1,135.0	920.0	874.5			
2241	2240	8				0.33	5.17	
2240	22.4	4	920.0	915.0	57.5			EX. 18" CMP
							5.32	Total Area

```
**************************************************************************

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                              Analysis prepared by:

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                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 224                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR224.DAT
  TIME/DATE OF STUDY: 13:09 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2242.00 TO NODE   2241.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1205.00
  DOWNSTREAM ELEVATION(FEET) =   1135.00
  ELEVATION DIFFERENCE(FEET) =    70.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.42
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
 FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    920.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   874.50   CHANNEL SLOPE =  0.2459
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1786 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.42
 FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.16   Tc(MIN.) =  12.42
 LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2240.00 =   974.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.127
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3330
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3335
 SUBAREA AREA(ACRES) =    5.17   SUBAREA RUNOFF(CFS) =    8.83
 TOTAL AREA(ACRES) =      5.32   TOTAL RUNOFF(CFS) =    9.10
 TC(MIN.) =  12.42

****************************************************************************
 FLOW PROCESS FROM NODE   2240.00 TO NODE     22.40 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   920.00  DOWNSTREAM(FEET) =   915.00
 FLOW LENGTH(FEET) =    57.50   MANNING'S N =  0.024
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.31
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      9.10
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  12.53
 LONGEST FLOWPATH FROM NODE   2242.00 TO NODE     22.40 =  1032.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      5.32  TC(MIN.) =     12.53
 PEAK FLOW RATE(CFS)   =      9.10
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR22

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2203	2202	2	1,445.0	1,405.0	100.0	0.35	0.2	
2202	2201	5	1,405.0	890.0	1,382.2			
2202	2201	8				0.45	8.69	
2204	2201	8				0.46	10.77	
2201	2200	5	890.0	830.0	471.5			
2201	2200	8				0.43	2.31	
2200	2200	1						1 of 2
2207	2206	2	1,290.0	1,265.0	76.3	0.35	0.21	
2206	2205	5	1,265.0	1,065.0	461.7			
2206	2205	8				0.46	4.73	
2205	2200	5	1,065.0	830.0	1,125.6			
2205	2200	8				0.45	11.51	
2200	2200	1						2 of 2
2200	22	4	817.0	815.0	46.0			EX. 24" CMP
							38.42	Total Area

```
**************************************************************************

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 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 22                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR22.DAT
  TIME/DATE OF STUDY: 13:03 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2202.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1445.00
  DOWNSTREAM ELEVATION(FEET) =   1405.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.108
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.105
 SUBAREA RUNOFF(CFS) =      0.57
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
 FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1405.00  DOWNSTREAM(FEET) =    890.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1382.20   CHANNEL SLOPE =  0.3726
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2092 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.57
 FLOW VELOCITY(FEET/SEC) =   2.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   8.99   Tc(MIN.) =  15.10
 LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2201.00 =  1477.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.520
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4520
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4497
 SUBAREA AREA(ACRES) =    8.69   SUBAREA RUNOFF(CFS) =   17.76
 TOTAL AREA(ACRES) =      8.89   TOTAL RUNOFF(CFS) =   18.07
 TC(MIN.) =  15.10

****************************************************************************
 FLOW PROCESS FROM NODE   2204.00 TO NODE   2201.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.520
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4570
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4537
 SUBAREA AREA(ACRES) =   10.77   SUBAREA RUNOFF(CFS) =   22.25
 TOTAL AREA(ACRES) =     19.66   TOTAL RUNOFF(CFS) =   40.32
 TC(MIN.) =  15.10

****************************************************************************
 FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    830.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   471.50   CHANNEL SLOPE =  0.1273
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1198 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     40.32
 FLOW VELOCITY(FEET/SEC) =   6.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =  16.29
 LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2200.00 =  1948.70 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.306
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4280
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4510
  SUBAREA AREA(ACRES) =    2.31   SUBAREA RUNOFF(CFS) =    4.26
  TOTAL AREA(ACRES) =     21.97   TOTAL RUNOFF(CFS) =   42.66
  TC(MIN.) =  16.29

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2200.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.29
  RAINFALL INTENSITY(INCH/HR) =   4.31
  TOTAL STREAM AREA(ACRES) =    21.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.66

****************************************************************************
  FLOW PROCESS FROM NODE   2207.00 TO NODE   2206.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    76.30
  UPSTREAM ELEVATION(FEET) =   1290.00
  DOWNSTREAM ELEVATION(FEET) =   1265.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.474
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.698
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.64

****************************************************************************
  FLOW PROCESS FROM NODE   2206.00 TO NODE   2205.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1265.00  DOWNSTREAM(FEET) =   1065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   461.70   CHANNEL SLOPE =  0.4332
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2180 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.64
  FLOW VELOCITY(FEET/SEC) =   2.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =   8.42
  LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2205.00 =   538.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2206.00 TO NODE   2205.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.590
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4553
  SUBAREA AREA(ACRES) =    4.73   SUBAREA RUNOFF(CFS) =   14.34
  TOTAL AREA(ACRES) =      4.94   TOTAL RUNOFF(CFS) =   14.82
  TC(MIN.) =   8.42

****************************************************************************
  FLOW PROCESS FROM NODE   2205.00 TO NODE   2200.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =    830.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1125.00   CHANNEL SLOPE =  0.2089
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1644 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     14.82
  FLOW VELOCITY(FEET/SEC) =   5.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.36   Tc(MIN.) =  11.78
  LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2200.00 =  1663.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2205.00 TO NODE   2200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.305
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4516
  SUBAREA AREA(ACRES) =   11.51   SUBAREA RUNOFF(CFS) =   27.48
  TOTAL AREA(ACRES) =     16.45   TOTAL RUNOFF(CFS) =   39.41
  TC(MIN.) =  11.78

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2200.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.78
  RAINFALL INTENSITY(INCH/HR) =   5.31
  TOTAL STREAM AREA(ACRES) =    16.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     39.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       42.66    16.29        4.306         21.97
      2       39.41    11.78        5.305         16.45

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       70.28    11.78       5.305
      2       74.65    16.29       4.306

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     74.65   Tc(MIN.) =   16.29
  TOTAL AREA(ACRES) =     38.42
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2200.00 =  1948.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE     22.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   817.00  DOWNSTREAM(FEET) =   815.00
  FLOW LENGTH(FEET) =    46.00   MANNING'S N =  0.024
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.51
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     74.65
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =  16.38
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE     22.00 =  1994.70 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     38.42  TC(MIN.) =     16.38
  PEAK FLOW RATE(CFS)   =     74.65
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR231

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments
2312	2311	2	1,150.0	1,080.0	100.0	0.46	0.13	
2311	2310	5	1,080.0	815.0	930.0			
2311	2310	8				0.43	4.32	
2310	23.1	4	815.0	813.0	46.0			EX. 24" CMP Culvert
							4.45	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 231                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR231.DAT
  TIME/DATE OF STUDY: 13:11 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2312.00 TO NODE   2311.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1150.00
  DOWNSTREAM ELEVATION(FEET) =   1080.00
  ELEVATION DIFFERENCE(FEET) =    70.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
 SUBAREA RUNOFF(CFS) =      0.53
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
 FLOW PROCESS FROM NODE   2311.00 TO NODE   2310.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    815.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.2849
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1912 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.53
 FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.33   Tc(MIN.) =  11.68
 LONGEST FLOWPATH FROM NODE   2312.00 TO NODE   2310.00 =  1030.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2311.00 TO NODE   2310.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.336
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4280
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4289
 SUBAREA AREA(ACRES) =    4.32   SUBAREA RUNOFF(CFS) =    9.87
 TOTAL AREA(ACRES) =      4.45   TOTAL RUNOFF(CFS) =   10.19
 TC(MIN.) =  11.68

****************************************************************************
 FLOW PROCESS FROM NODE   2310.00 TO NODE     23.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   815.00  DOWNSTREAM(FEET) =   813.00
 FLOW LENGTH(FEET) =    46.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.38
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     10.19
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  11.78
 LONGEST FLOWPATH FROM NODE   2312.00 TO NODE     23.10 =  1076.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      4.45  TC(MIN.) =     11.78
 PEAK FLOW RATE(CFS)   =     10.19
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR232

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2323	2322	2	1,350.0	1,300.0	100.0	0.46	0.29	
2322	2321	5	1,300.0	950.0	715.0			
2322	2321	8				0.46	2.78	
2321	2320	5	950.0	810.0	715.0			
2321	2320	8				0.42	4.83	
2320	23.2	4	810.0	808.0	50.0			Existing 24"CMP culvert
							7.9	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 232                                                         *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR232.DAT
  TIME/DATE OF STUDY: 13:13 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2323.00 TO NODE   2322.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1350.00
  DOWNSTREAM ELEVATION(FEET) =   1300.00
  ELEVATION DIFFERENCE(FEET) =    50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
 SUBAREA RUNOFF(CFS) =      1.18
 TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.18

****************************************************************************
 FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   715.00   CHANNEL SLOPE =  0.4895
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2240 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.18
 FLOW VELOCITY(FEET/SEC) =   2.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.26   Tc(MIN.) =   9.61
 LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2321.00 =   815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.052
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
 SUBAREA AREA(ACRES) =    2.78   SUBAREA RUNOFF(CFS) =    7.74
 TOTAL AREA(ACRES) =      3.07   TOTAL RUNOFF(CFS) =    8.55
 TC(MIN.) =   9.61

****************************************************************************
 FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   715.00   CHANNEL SLOPE =  0.1958
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1579 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.55
 FLOW VELOCITY(FEET/SEC) =   4.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.62   Tc(MIN.) =  12.23
 LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2320.00 =  1530.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.180
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4355
 SUBAREA AREA(ACRES) =    4.83   SUBAREA RUNOFF(CFS) =   10.51
 TOTAL AREA(ACRES) =      7.90   TOTAL RUNOFF(CFS) =   17.82
 TC(MIN.) =  12.23

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2320.00 TO NODE     23.20 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   808.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.16
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     17.82
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  12.33
  LONGEST FLOWPATH FROM NODE   2323.00 TO NODE     23.20 =  1580.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      7.90  TC(MIN.) =     12.33
  PEAK FLOW RATE(CFS)   =     17.82
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR233

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2333	2332	2	1,270.0	1,195.0	100.0	0.46	0.32	
2332	2331	5	1,195.0	925.0	515.0			
2332	2331	8				0.46	2.23	
2331	2330	5	925.0	810.0	700.0			
2331	2330	8				0.43	4.94	
2330	23.3	4	810.0	808.0	54.0			Existing 18"CMP Culvert
							7.49	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 233                                                         *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR233.DAT
  TIME/DATE OF STUDY: 13:15 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2333.00 TO NODE   2332.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =    75.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
 SUBAREA RUNOFF(CFS) =      1.30
 TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      1.30

****************************************************************************
 FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    925.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.5243
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2262 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.30
 FLOW VELOCITY(FEET/SEC) =   2.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.95   Tc(MIN.) =   8.30
 LONGEST FLOWPATH FROM NODE   2333.00 TO NODE   2331.00 =   615.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.650
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
 SUBAREA AREA(ACRES) =    2.23   SUBAREA RUNOFF(CFS) =    6.82
 TOTAL AREA(ACRES) =      2.55   TOTAL RUNOFF(CFS) =    7.80
 TC(MIN.) =   8.30

****************************************************************************
 FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    925.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   700.00   CHANNEL SLOPE =  0.1643
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1421 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.80
 FLOW VELOCITY(FEET/SEC) =   4.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =  11.09
 LONGEST FLOWPATH FROM NODE   2333.00 TO NODE   2330.00 =  1315.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.517
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4320
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4415
 SUBAREA AREA(ACRES) =    4.94   SUBAREA RUNOFF(CFS) =   11.77
 TOTAL AREA(ACRES) =      7.49   TOTAL RUNOFF(CFS) =   18.24
 TC(MIN.) =  11.09

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2330.00 TO NODE     23.30 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   808.00
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.024
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.48
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     18.24
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =  11.23
  LONGEST FLOWPATH FROM NODE   2333.00 TO NODE     23.30 =  1369.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      7.49  TC(MIN.) =     11.23
  PEAK FLOW RATE(CFS)   =     18.24
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR234

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2343	2342	2	1,360.0	1,305.0	100.0	0.34	0.12	
2342	2341	5	1,305.0	890.0	1,720.0			
2342	2341	8				0.45	3.46	
2341	2340	5	890.0	810.0	631.0			
2341	2340	8				0.42	6.83	
2340	23.4	4	810.0	808.0	64.0			Existing 24"CMP Culvert
							10.41	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 234                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR234.DAT
  TIME/DATE OF STUDY: 13:16 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2343.00 TO NODE   2342.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3410
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1360.00
  DOWNSTREAM ELEVATION(FEET) =   1305.00
  ELEVATION DIFFERENCE(FEET) =    55.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.342
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.911
 SUBAREA RUNOFF(CFS) =      0.33
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
 FLOW PROCESS FROM NODE   2342.00 TO NODE   2341.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =    890.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1720.00   CHANNEL SLOPE =  0.2413
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1771 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.33
 FLOW VELOCITY(FEET/SEC) =   2.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  12.16   Tc(MIN.) =  18.51
 LONGEST FLOWPATH FROM NODE   2343.00 TO NODE   2341.00 =  1820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2342.00 TO NODE   2341.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.965
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4510
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4472
 SUBAREA AREA(ACRES) =    3.46   SUBAREA RUNOFF(CFS) =    6.19
 TOTAL AREA(ACRES) =      3.58   TOTAL RUNOFF(CFS) =    6.35
 TC(MIN.) =  18.51

****************************************************************************
 FLOW PROCESS FROM NODE   2341.00 TO NODE   2340.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   631.00   CHANNEL SLOPE =  0.1268
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1195 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.35
 FLOW VELOCITY(FEET/SEC) =   3.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =  21.44
 LONGEST FLOWPATH FROM NODE   2343.00 TO NODE   2340.00 =  2451.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2341.00 TO NODE   2340.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.606
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4294
 SUBAREA AREA(ACRES) =    6.83   SUBAREA RUNOFF(CFS) =   10.34
 TOTAL AREA(ACRES) =     10.41   TOTAL RUNOFF(CFS) =   16.12
 TC(MIN.) =  21.44
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2340.00 TO NODE     23.40 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   808.00
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.24
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     16.12
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =  21.59
  LONGEST FLOWPATH FROM NODE   2343.00 TO NODE     23.40 =  2515.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     10.41  TC(MIN.) =     21.59
  PEAK FLOW RATE(CFS)   =     16.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR23

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2304	2303	2	1,325.0	1,268.0	100.0	0.35	1.04	
2303	2301	5	1,268.0	863.0	1,070.0			
2303	2301	8				0.35	7.47	
2301	2300	5	863.0	808.0	510.0			
2301	2300	8				0.45	16.114	
2300	23	4	808.0	801.0	100.0			Existing 36"CMP Culvert
								Storm Drain
							24.624	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 23                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR23.DAT
  TIME/DATE OF STUDY: 13:10 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2304.00 TO NODE   2303.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1325.00
  DOWNSTREAM ELEVATION(FEET) =   1268.00
  ELEVATION DIFFERENCE(FEET) =    57.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      2.90
 TOTAL AREA(ACRES) =      1.04   TOTAL RUNOFF(CFS) =      2.90

****************************************************************************
 FLOW PROCESS FROM NODE   2303.00 TO NODE   2301.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1268.00  DOWNSTREAM(FEET) =    863.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00   CHANNEL SLOPE =  0.3785
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2102 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.90
 FLOW VELOCITY(FEET/SEC) =   3.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.87   Tc(MIN.) =  11.14
 LONGEST FLOWPATH FROM NODE   2304.00 TO NODE   2301.00 =  1170.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2303.00 TO NODE   2301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.501
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3450
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3456
 SUBAREA AREA(ACRES) =    7.47   SUBAREA RUNOFF(CFS) =   14.18
 TOTAL AREA(ACRES) =      8.51   TOTAL RUNOFF(CFS) =   16.18
 TC(MIN.) =  11.14

****************************************************************************
 FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    863.00  DOWNSTREAM(FEET) =    808.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   510.00   CHANNEL SLOPE =  0.1078
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1059 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     16.18
 FLOW VELOCITY(FEET/SEC) =   4.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.85   Tc(MIN.) =  12.98
 LONGEST FLOWPATH FROM NODE   2304.00 TO NODE   2300.00 =  1680.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.983
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4460
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4113
 SUBAREA AREA(ACRES) =   16.11   SUBAREA RUNOFF(CFS) =   35.81
 TOTAL AREA(ACRES) =     24.62   TOTAL RUNOFF(CFS) =   50.47
 TC(MIN.) =  12.98

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2300.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   808.00  DOWNSTREAM(FEET) =   801.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  19.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.17
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     50.47
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =  13.11
  LONGEST FLOWPATH FROM NODE   2304.00 TO NODE     23.00 =  1780.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     24.62  TC(MIN.) =     13.11
  PEAK FLOW RATE(CFS)   =     50.47
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR241

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2412	2411	2	987.0	953.0	91.0	0.42	0.08	
2411	2410	5	953.0	805.0	1,161.0			
2411	2410	8				0.42	10.58	
							10.66	Total Area

```
**************************************************************************

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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                           Fuscoe Engineering, San Diego
                            6390 Greenwich Dr. Suite 170
                                San Diego, CA 92122
                                   858-554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 24.1                                                        *
* 2469.01A - MARCH 2007                                                  *
 ************************************************************************

  FILE NAME: MERR241.DAT
  TIME/DATE OF STUDY: 09:55 02/19/2007
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2412.00 TO NODE   2411.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    91.00
  UPSTREAM ELEVATION(FEET) =    987.00
  DOWNSTREAM ELEVATION(FEET) =    953.00
  ELEVATION DIFFERENCE(FEET) =     34.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.420
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.754
 SUBAREA RUNOFF(CFS) =      0.29
 TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.29

****************************************************************************
 FLOW PROCESS FROM NODE   2411.00 TO NODE   2410.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    953.00  DOWNSTREAM(FEET) =    805.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1161.00   CHANNEL SLOPE =  0.1275
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1200 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.29
 FLOW VELOCITY(FEET/SEC) =   1.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   9.98   Tc(MIN.) =  15.40
 LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   2410.00 =  1252.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2410.00 TO NODE     24.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.465
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
 SUBAREA AREA(ACRES) =   10.58   SUBAREA RUNOFF(CFS) =   19.84
 TOTAL AREA(ACRES) =     10.66   TOTAL RUNOFF(CFS) =   19.99
 TC(MIN.) =  15.40
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     10.66  TC(MIN.) =     15.40
 PEAK FLOW RATE(CFS)   =     19.99
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR242

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2422	2421	2	1,075.0	1,015.0	100.0	0.42	0.33	
2421	2420	5	1,015.0	815.0	1,080.0			
2421	2420	8				0.43	8.69	
2420	24.2	4	806.0	802.0	36.0			Existing 18" CMP culvert
							9.02	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 242                                                         *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR242.DAT
  TIME/DATE OF STUDY: 13:21 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2422.00 TO NODE   2421.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =   1015.00
  ELEVATION DIFFERENCE(FEET) =     60.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.682
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.492
 SUBAREA RUNOFF(CFS) =      1.18
 TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.18

****************************************************************************
 FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1015.00  DOWNSTREAM(FEET) =    815.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1080.00   CHANNEL SLOPE =  0.1852
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1526 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.18
 FLOW VELOCITY(FEET/SEC) =   2.31 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.79   Tc(MIN.) =  13.48
 LONGEST FLOWPATH FROM NODE   2422.00 TO NODE   2420.00 =  1180.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.865
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4290
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4287
 SUBAREA AREA(ACRES) =    8.69   SUBAREA RUNOFF(CFS) =   18.14
 TOTAL AREA(ACRES) =      9.02   TOTAL RUNOFF(CFS) =   18.81
 TC(MIN.) =  13.48

****************************************************************************
 FLOW PROCESS FROM NODE   2420.00 TO NODE     24.20 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   806.00  DOWNSTREAM(FEET) =   802.00
 FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.024
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.22
 (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
  AT DEPTH = 0.94 * DIAMETER)
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     18.81
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =  13.53
 LONGEST FLOWPATH FROM NODE   2422.00 TO NODE     24.20 =  1216.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      9.02  TC(MIN.) =     13.53
 PEAK FLOW RATE(CFS)   =     18.81
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR24

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2403	2402	2	1,360.0	1,310.0	95.0	0.46	0.33	
2402	2401	5	1,310.0	1,130.0	305.0			
2402	2401	8				0.46	1.82	
2401	2400	5	1,130.0	805.0	1,330.0			
2401	2400	8				0.44	31.33	
2400	24	4	805.0	803.0	50.0			Existing 36" CMP culvert
							33.48	Total Area

```
**************************************************************************

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                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 24                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR24.DAT
  TIME/DATE OF STUDY: 13:19 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2403.00 TO NODE   2402.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1360.00
  DOWNSTREAM ELEVATION(FEET) =   1310.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.212
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.978
 SUBAREA RUNOFF(CFS) =      1.36
 TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.36

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1310.00  DOWNSTREAM(FEET) =   1130.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.5902
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.36
 FLOW VELOCITY(FEET/SEC) =   2.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   6.92
 LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2401.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.477
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
 SUBAREA AREA(ACRES) =    1.82   SUBAREA RUNOFF(CFS) =    6.26
 TOTAL AREA(ACRES) =      2.15   TOTAL RUNOFF(CFS) =    7.39
 TC(MIN.) =   6.92

****************************************************************************
 FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1130.00  DOWNSTREAM(FEET) =    805.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1330.00   CHANNEL SLOPE =  0.2444
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1781 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.39
 FLOW VELOCITY(FEET/SEC) =   4.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.82   Tc(MIN.) =  11.74
 LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2400.00 =  1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.318
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4430
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4441
 SUBAREA AREA(ACRES) =   31.33   SUBAREA RUNOFF(CFS) =   73.81
 TOTAL AREA(ACRES) =     33.48   TOTAL RUNOFF(CFS) =   79.07
 TC(MIN.) =  11.74

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2400.00 TO NODE     24.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   805.00  DOWNSTREAM(FEET) =   803.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.024
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.69
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     79.07
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =  11.82
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE     24.00 =  1780.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     33.48  TC(MIN.) =     11.82
  PEAK FLOW RATE(CFS)   =     79.07
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR25

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2532	2531.8	2	1,315.0	1,300.0	75.0	0.25	0.36	
2531.8	2531.6	5	1,295.0	1,250.0	300.0			
2531.8	2531.6	8				0.25	2.59	
2531.6	2531.4	5	1,250.0	1,195.0	600.0			
2531.6	2531.4	8				0.25	6.81	
2531.4	2531	5	1,195.0	1,170.0	525.0			
2531.4	2531	8				0.25	19.66	
2531	2530	5	1,170.0	915.0	1,765.0			
2531	2530	8				0.27	74.78	
2530	2502	5	915.0	835.0	1,820.0			L=1820*ADD
2502	2502	10						Memory Bank
2506	2505.8	2	1,330.0	1,315.0	75.0	0.25	0.67	
2505.8	2505.6	5	1,315.0	1,285.0	300.0			
2505.8	2505.6	8				0.29	1.87	
2505.6	2505.4	5	1,285.0	1,220.0	600.0			
2505.6	2505.4	8				0.26	8.11	
2505.4	2505	5	1,220.0	1,105.0	815.0			
2505.4	2505	8				0.31	54.68	
2505	2504	5	1,105.0	885.0	1,775.0			
2505	2504	8				0.42	88.48	
2504	2504	1						1 of 2
2521	2520.8	2	1,400.0	1,375.0	75.0	0.35	0.26	
2520.8	2520.6	5	1,375.0	1,290.0	300.0			
2520.8	2520.6	8				0.33	3.33	
2520.6	2520.4	5	1,290.0	1,120.0	680.0			L= 680
2520.6	2520.4	8				0.34	17.84	
2520.4	2520	5	1,120.0	935.0	1,225.0			L=1225
2520.4	2520	8				0.43	53.58	
2520	2504	5	935.0	885.0	590.0			
2504	2504	1						2 of 2
2504	2502	5	885.0	835.0	1,655.0			L= 1655
2502	2502	11						Add Memory Bank
2502	2501	5	835.0	825.0	475.0			
2501	2501	1						1 of 2
2511	2510.8	2	1,180.0	1,155.0	75.0	0.38	0.14	
2510.8	2510.6	5	1,155.0	1,070.0	300.0			
2510.8	2510.6	8				0.38	1.86	
2510.6	2510.4	5	1,070.0	955.0	600.0			
2510.6	2510.4	8				0.38	10.41	
2510.4	2510	5	955.0	885.0	440.0			
2510.4	2510	8				0.38	16.1	
2510	2501	5	885.0	825.0	1,010.0			
2501	2501	1						2 of 2
2501	25.2	5	825.0	815.0	660.0			

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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR25

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments
2530	25.2	8				0.47	131.22	
25.2	25	5	815.0	793.0	949.0			
25	25	10						
25.07	25.06	2	1,184.0	1,162.0	84.0	0.42	0.14	
25.06	25.05	5	1,162.0	1,155.0	500.0			
25.06	25.05	8				0.42	6.15	
25.05	25.01	5	1,155.0	817.0	1,196.0			
25.05	25.01	8				0.52	23.41	
25.01	25.01	1						
25.04	25.03	2	1,300.0	1,272.0	96.0	0.46	0.09	
25.03	25.02	5	1,272.0	1,050.0	582.0			
25.02	25.02	8				0.42	5.1	
25.02	25.01	5	1,050.0	817.0	1,482.0			
25.01	25.01	8				0.42	13.52	
25.01	25.01	1						
25.01	25	5	817.0	793.0	553.0			
25	25	11						
							541.16	Total Area

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Run Name:
MERR25
Page 3

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

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Job #:
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Run Name:
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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 25                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR25.DAT
  TIME/DATE OF STUDY: 13:39 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2532.00 TO NODE   2531.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1315.00
  DOWNSTREAM ELEVATION(FEET) =   1300.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
 SUBAREA RUNOFF(CFS) =      0.73
 TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
 FLOW PROCESS FROM NODE   2531.80 TO NODE   2531.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1250.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1350 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.73
 FLOW VELOCITY(FEET/SEC) =   2.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.43   Tc(MIN.) =   8.58
 LONGEST FLOWPATH FROM NODE   2532.00 TO NODE   2531.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2531.80 TO NODE   2531.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.509
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    2.59   SUBAREA RUNOFF(CFS) =    4.21
 TOTAL AREA(ACRES) =      2.95   TOTAL RUNOFF(CFS) =    4.80
 TC(MIN.) =   8.58

****************************************************************************
 FLOW PROCESS FROM NODE   2531.60 TO NODE   2531.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1250.00  DOWNSTREAM(FEET) =   1195.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0917
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0917 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      4.80
 FLOW VELOCITY(FEET/SEC) =   2.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.50   Tc(MIN.) =  12.08
 LONGEST FLOWPATH FROM NODE   2532.00 TO NODE   2531.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2531.60 TO NODE   2531.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.221
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    6.81   SUBAREA RUNOFF(CFS) =    8.89
 TOTAL AREA(ACRES) =      9.76   TOTAL RUNOFF(CFS) =   12.74
 TC(MIN.) =  12.08
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   2531.40 TO NODE   2531.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =   1170.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.0476
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0476 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     12.74
  FLOW VELOCITY(FEET/SEC) =   2.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.07   Tc(MIN.) =  15.15
  LONGEST FLOWPATH FROM NODE   2532.00 TO NODE   2531.00 =  1500.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2531.40 TO NODE   2531.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.512
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   19.66   SUBAREA RUNOFF(CFS) =   22.17
  TOTAL AREA(ACRES) =     29.42   TOTAL RUNOFF(CFS) =   33.18
  TC(MIN.) =  15.15

**************************************************************************
  FLOW PROCESS FROM NODE   2531.00 TO NODE   2530.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1170.00  DOWNSTREAM(FEET) =    915.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1765.00   CHANNEL SLOPE =  0.1445
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1313 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     33.18
  FLOW VELOCITY(FEET/SEC) =   6.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.52   Tc(MIN.) =  19.66
  LONGEST FLOWPATH FROM NODE   2532.00 TO NODE   2530.00 =  3265.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2531.00 TO NODE   2530.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.813
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2644
  SUBAREA AREA(ACRES) =   74.78   SUBAREA RUNOFF(CFS) =   76.98
  TOTAL AREA(ACRES) =    104.20   TOTAL RUNOFF(CFS) =  105.02
  TC(MIN.) =  19.66

**************************************************************************
  FLOW PROCESS FROM NODE   2530.00 TO NODE   2502.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    915.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1820.00   CHANNEL SLOPE =  0.0440
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0440 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    105.02
  FLOW VELOCITY(FEET/SEC) =   5.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.48   Tc(MIN.) =  25.15
  LONGEST FLOWPATH FROM NODE   2532.00 TO NODE   2502.00 =  5085.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2506.00 TO NODE   2505.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1330.00
  DOWNSTREAM ELEVATION(FEET) =   1315.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
  SUBAREA RUNOFF(CFS) =      1.35
  TOTAL AREA(ACRES) =      0.67   TOTAL RUNOFF(CFS) =      1.35

****************************************************************************
  FLOW PROCESS FROM NODE   2505.80 TO NODE   2505.60 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1315.00  DOWNSTREAM(FEET) =   1285.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      1.35
  FLOW VELOCITY(FEET/SEC) =   1.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.55   Tc(MIN.) =   8.70
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2505.60 =   375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2505.80 TO NODE   2505.60 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.449
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2794
  SUBAREA AREA(ACRES) =    1.87   SUBAREA RUNOFF(CFS) =    3.50
  TOTAL AREA(ACRES) =      2.54   TOTAL RUNOFF(CFS) =    4.58
  TC(MIN.) =   8.70
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2505.60 TO NODE   2505.40 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1285.00  DOWNSTREAM(FEET) =   1220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1083
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1063 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      4.58
  FLOW VELOCITY(FEET/SEC) =   3.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.30   Tc(MIN.) =  12.01
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2505.40 =   975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2505.60 TO NODE   2505.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.241
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2646
  SUBAREA AREA(ACRES) =    8.11   SUBAREA RUNOFF(CFS) =   11.05
  TOTAL AREA(ACRES) =     10.65   TOTAL RUNOFF(CFS) =   14.77
  TC(MIN.) =  12.01

****************************************************************************
  FLOW PROCESS FROM NODE   2505.40 TO NODE   2505.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1220.00  DOWNSTREAM(FEET) =   1105.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   815.00   CHANNEL SLOPE =  0.1411
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1291 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     14.77
  FLOW VELOCITY(FEET/SEC) =   4.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.75   Tc(MIN.) =  14.76
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2505.00 =  1790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2505.40 TO NODE   2505.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.588
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3026
  SUBAREA AREA(ACRES) =   54.68   SUBAREA RUNOFF(CFS) =   77.76
  TOTAL AREA(ACRES) =     65.33   TOTAL RUNOFF(CFS) =   90.69
  TC(MIN.) =  14.76

****************************************************************************
  FLOW PROCESS FROM NODE   2505.00 TO NODE   2504.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1775.00   CHANNEL SLOPE =  0.1239
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1176 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     90.69
  FLOW VELOCITY(FEET/SEC) =   8.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.43   Tc(MIN.) =  18.19
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2504.00 =  3565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2505.00 TO NODE   2504.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.009
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3701
  SUBAREA AREA(ACRES) =   88.48   SUBAREA RUNOFF(CFS) =  148.97
  TOTAL AREA(ACRES) =    153.81   TOTAL RUNOFF(CFS) =  228.22
  TC(MIN.) =  18.19

****************************************************************************
  FLOW PROCESS FROM NODE   2504.00 TO NODE   2504.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.19
  RAINFALL INTENSITY(INCH/HR) =   4.01
  TOTAL STREAM AREA(ACRES) =   153.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    228.22

****************************************************************************
  FLOW PROCESS FROM NODE   2521.00 TO NODE   2520.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1400.00
  DOWNSTREAM ELEVATION(FEET) =   1375.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.80

****************************************************************************
  FLOW PROCESS FROM NODE   2520.80 TO NODE   2520.60 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1375.00  DOWNSTREAM(FEET) =   1290.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2833
  SLOPE ADJUSTMENT CURVE USED:
```

```
  EFFECTIVE SLOPE = .1908 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.80
  FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   7.47
  LONGEST FLOWPATH FROM NODE   2521.00 TO NODE   2520.60 =   375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2520.80 TO NODE   2520.60 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.117
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3314
  SUBAREA AREA(ACRES) =    3.33   SUBAREA RUNOFF(CFS) =    7.82
  TOTAL AREA(ACRES) =      3.59   TOTAL RUNOFF(CFS) =    8.47
  TC(MIN.) =   7.47

****************************************************************************
  FLOW PROCESS FROM NODE   2520.60 TO NODE   2520.40 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1290.00  DOWNSTREAM(FEET) =   1120.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   680.00   CHANNEL SLOPE =  0.2500
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1800 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      8.47
  FLOW VELOCITY(FEET/SEC) =   4.84 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.34   Tc(MIN.) =   9.81
  LONGEST FLOWPATH FROM NODE   2521.00 TO NODE   2520.40 =  1055.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2520.60 TO NODE   2520.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.969
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3386
  SUBAREA AREA(ACRES) =   17.84   SUBAREA RUNOFF(CFS) =   36.21
  TOTAL AREA(ACRES) =     21.43   TOTAL RUNOFF(CFS) =   43.31
  TC(MIN.) =   9.81

****************************************************************************
  FLOW PROCESS FROM NODE   2520.40 TO NODE   2520.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1120.00  DOWNSTREAM(FEET) =    935.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1225.00   CHANNEL SLOPE =  0.1510
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1355 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     43.31
  FLOW VELOCITY(FEET/SEC) =   7.23 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =  12.64
```

```
 LONGEST FLOWPATH FROM NODE   2521.00 TO NODE   2520.00 =  2280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2520.40 TO NODE   2520.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.071
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4300
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4039
 SUBAREA AREA(ACRES) =   53.58   SUBAREA RUNOFF(CFS) =  116.83
 TOTAL AREA(ACRES) =     75.01   TOTAL RUNOFF(CFS) =  153.62
 TC(MIN.) =  12.64

****************************************************************************
 FLOW PROCESS FROM NODE   2520.00 TO NODE   2504.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    935.00  DOWNSTREAM(FEET) =    885.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   590.00   CHANNEL SLOPE =  0.0847
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0847 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    153.62
 FLOW VELOCITY(FEET/SEC) =   8.72 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =  13.76
 LONGEST FLOWPATH FROM NODE   2521.00 TO NODE   2504.00 =  2870.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2504.00 TO NODE   2504.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  13.76
 RAINFALL INTENSITY(INCH/HR) =   4.80
 TOTAL STREAM AREA(ACRES) =    75.01
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    153.62

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      228.22    18.19        4.009        153.81
     2      153.62    13.76        4.799         75.01

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      326.29    13.76       4.799
     2      356.54    18.19       4.009

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    356.54   Tc(MIN.) =   18.19
 TOTAL AREA(ACRES) =    228.82
 LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2504.00 =  3565.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2504.00 TO NODE   2502.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    885.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1655.00   CHANNEL SLOPE =  0.0302
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0302 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    356.54
  FLOW VELOCITY(FEET/SEC) =   6.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.00   Tc(MIN.) =  22.20
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2502.00 =  5220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1      356.54    22.20        3.526      228.82
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2502.00 =  5220.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1      105.02    25.15        3.253      104.20
  LONGEST FLOWPATH FROM NODE   2532.00 TO NODE   2502.00 =  5085.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     449.24      22.20        3.526
      2     433.99      25.15        3.253

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    449.24   Tc(MIN.) =   22.20
  TOTAL AREA(ACRES) =    333.02

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2501.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.0211
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0211 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    449.24
  FLOW VELOCITY(FEET/SEC) =   6.21 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =  23.47
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2501.00 =  5695.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2501.00 TO NODE   2501.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  23.47
  RAINFALL INTENSITY(INCH/HR) =   3.40
  TOTAL STREAM AREA(ACRES) =   333.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    449.24

****************************************************************************
  FLOW PROCESS FROM NODE   2511.00 TO NODE   2510.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1180.00
  DOWNSTREAM ELEVATION(FEET) =   1155.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.210
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.980
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE   2510.80 TO NODE   2510.60 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1155.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2833
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1908 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.48
  FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   7.25
  LONGEST FLOWPATH FROM NODE   2511.00 TO NODE   2510.60 =   375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2510.80 TO NODE   2510.60 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.254
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3800
  SUBAREA AREA(ACRES) =    1.86   SUBAREA RUNOFF(CFS) =    5.13
  TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =    5.51
  TC(MIN.) =   7.25

****************************************************************************
  FLOW PROCESS FROM NODE   2510.60 TO NODE   2510.40 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =    955.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1917
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1558 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      5.51
  FLOW VELOCITY(FEET/SEC) =   3.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =   9.82
  LONGEST FLOWPATH FROM NODE   2511.00 TO NODE   2510.40 =   975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2510.60 TO NODE   2510.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.968
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3800
  SUBAREA AREA(ACRES) =   10.41   SUBAREA RUNOFF(CFS) =   23.61
  TOTAL AREA(ACRES) =     12.41   TOTAL RUNOFF(CFS) =   28.14
  TC(MIN.) =   9.82

****************************************************************************
  FLOW PROCESS FROM NODE   2510.40 TO NODE   2510.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.1591
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1395 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     28.14
  FLOW VELOCITY(FEET/SEC) =   6.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.15   Tc(MIN.) =  10.97
  LONGEST FLOWPATH FROM NODE   2511.00 TO NODE   2510.00 =  1415.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2510.40 TO NODE   2510.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.555
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3800
  SUBAREA AREA(ACRES) =   16.10   SUBAREA RUNOFF(CFS) =   33.99
  TOTAL AREA(ACRES) =     28.51   TOTAL RUNOFF(CFS) =   60.19
  TC(MIN.) =  10.97

****************************************************************************
  FLOW PROCESS FROM NODE   2510.00 TO NODE   2501.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    885.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1010.00   CHANNEL SLOPE =  0.0594
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0594 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     60.19
  FLOW VELOCITY(FEET/SEC) =   5.34 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
 TRAVEL TIME(MIN.) =   3.15   Tc(MIN.) =  14.12
 LONGEST FLOWPATH FROM NODE   2511.00 TO NODE   2501.00 =  2425.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2501.00 TO NODE   2501.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.12
 RAINFALL INTENSITY(INCH/HR) =   4.72
 TOTAL STREAM AREA(ACRES) =    28.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     60.19

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      449.24    23.47        3.401        333.02
     2       60.19    14.12        4.720         28.51

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      330.45    14.12       4.720
     2      492.61    23.47       3.401

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    492.61   Tc(MIN.) =   23.47
 TOTAL AREA(ACRES) =    361.53
 LONGEST FLOWPATH FROM NODE   2506.00 TO NODE   2501.00 =  5695.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2501.00 TO NODE     25.20 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    815.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   660.00   CHANNEL SLOPE =  0.0152
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0152 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    492.61
 FLOW VELOCITY(FEET/SEC) =   5.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =  25.50
 LONGEST FLOWPATH FROM NODE   2506.00 TO NODE     25.20 =  6355.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2530.00 TO NODE     25.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.224
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3801
 SUBAREA AREA(ACRES) =  131.22   SUBAREA RUNOFF(CFS) =  198.86
 TOTAL AREA(ACRES) =    492.75   TOTAL RUNOFF(CFS) =  603.87
```

```
  TC(MIN.) =  25.50

****************************************************************************
  FLOW PROCESS FROM NODE     25.20 TO NODE     25.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.00  DOWNSTREAM(FEET) =    793.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   949.00   CHANNEL SLOPE =  0.0232
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0232 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    603.87
  FLOW VELOCITY(FEET/SEC) =   7.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =  27.70
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE     25.00 =  7304.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     25.07 TO NODE     25.06 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    84.00
  UPSTREAM ELEVATION(FEET) =   1184.00
  DOWNSTREAM ELEVATION(FEET) =   1162.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.207
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.983
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE     25.06 TO NODE     25.05 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1162.00  DOWNSTREAM(FEET) =   1155.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00   CHANNEL SLOPE =  0.0140
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0140 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.53
  FLOW VELOCITY(FEET/SEC) =   0.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  12.58   Tc(MIN.) =  17.78
  LONGEST FLOWPATH FROM NODE     25.07 TO NODE     25.05 =   584.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.05 TO NODE     25.05 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.068
```

```
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =    6.15   SUBAREA RUNOFF(CFS) =   10.51
  TOTAL AREA(ACRES) =      6.29   TOTAL RUNOFF(CFS) =   10.75
  TC(MIN.) =  17.78

****************************************************************************
  FLOW PROCESS FROM NODE     25.05 TO NODE     25.01 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1155.00  DOWNSTREAM(FEET) =    817.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1196.00   CHANNEL SLOPE =  0.2826
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1907 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     10.75
  FLOW VELOCITY(FEET/SEC) =   5.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.70   Tc(MIN.) =  21.48
  LONGEST FLOWPATH FROM NODE     25.07 TO NODE     25.01 =  1780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.01 TO NODE     25.01 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.601
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4988
  SUBAREA AREA(ACRES) =   23.41   SUBAREA RUNOFF(CFS) =   43.84
  TOTAL AREA(ACRES) =     29.70   TOTAL RUNOFF(CFS) =   53.35
  TC(MIN.) =  21.48

****************************************************************************
  FLOW PROCESS FROM NODE     25.01 TO NODE     25.01 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  21.48
  RAINFALL INTENSITY(INCH/HR) =   3.60
  TOTAL STREAM AREA(ACRES) =    29.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     53.35

****************************************************************************
  FLOW PROCESS FROM NODE     25.04 TO NODE     25.03 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    96.00
  UPSTREAM ELEVATION(FEET) =   1300.00
  DOWNSTREAM ELEVATION(FEET) =   1272.00
  ELEVATION DIFFERENCE(FEET) =     28.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.239
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.947
 SUBAREA RUNOFF(CFS) =      0.37
 TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
 FLOW PROCESS FROM NODE     25.03 TO NODE     25.02 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1272.00  DOWNSTREAM(FEET) =   1050.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   582.00   CHANNEL SLOPE =  0.3814
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2108 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.37
 FLOW VELOCITY(FEET/SEC) =   2.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.77   Tc(MIN.) =   9.01
 LONGEST FLOWPATH FROM NODE     25.04 TO NODE     25.02 =   678.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     25.02 TO NODE     25.02 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.306
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4207
 SUBAREA AREA(ACRES) =    5.10   SUBAREA RUNOFF(CFS) =   13.51
 TOTAL AREA(ACRES) =      5.19   TOTAL RUNOFF(CFS) =   13.77
 TC(MIN.) =   9.01

****************************************************************************
 FLOW PROCESS FROM NODE     25.02 TO NODE     25.01 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =    817.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1482.00   CHANNEL SLOPE =  0.1572
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1386 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     13.77
 FLOW VELOCITY(FEET/SEC) =   4.99 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.95   Tc(MIN.) =  13.96
 LONGEST FLOWPATH FROM NODE     25.04 TO NODE     25.01 =  2160.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     25.01 TO NODE     25.01 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.755
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4202
 SUBAREA AREA(ACRES) =   13.52   SUBAREA RUNOFF(CFS) =   27.00
 TOTAL AREA(ACRES) =     18.71   TOTAL RUNOFF(CFS) =   37.39
 TC(MIN.) =  13.96
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     25.01 TO NODE     25.01 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.96
  RAINFALL INTENSITY(INCH/HR) =   4.76
  TOTAL STREAM AREA(ACRES) =    18.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       53.35    21.48        3.601         29.70
      2       37.39    13.96        4.755         18.71

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       72.06    13.96       4.755
      2       81.67    21.48       3.601

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     81.67   Tc(MIN.) =   21.48
  TOTAL AREA(ACRES) =     48.41
  LONGEST FLOWPATH FROM NODE     25.04 TO NODE     25.01 =  2160.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.01 TO NODE     25.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    817.00  DOWNSTREAM(FEET) =    793.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   553.00   CHANNEL SLOPE =  0.0434
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0434 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     81.67
  FLOW VELOCITY(FEET/SEC) =   5.05 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =  23.30
  LONGEST FLOWPATH FROM NODE     25.04 TO NODE     25.00 =  2713.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1       81.67    23.30       3.417        48.41
  LONGEST FLOWPATH FROM NODE     25.04 TO NODE     25.00 =  2713.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
```

```
     1      603.87    27.70        3.057      492.75
  LONGEST FLOWPATH FROM NODE   2506.00 TO NODE     25.00 =  7304.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      589.78      23.30        3.417
     2      676.93      27.70        3.057

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    676.93   Tc(MIN.) =   27.70
  TOTAL AREA(ACRES) =    541.16
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    541.16  TC(MIN.) =     27.70
  PEAK FLOW RATE(CFS)   =    676.93
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Existing Condition

BASIN C

FUSCOE
ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR26

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2604	2603.8	2	1,410.0	1,395.0	75.0	0.42	1.18	
2603.8	2603.6	5	1,395.0	1,365.0	300.0			
2603.8	2603.6	8				0.45	3.09	
2603.6	2603.4	5	1,365.0	1,325.0	600.0			
2603.6	2603.4	8				0.32	14.67	
2603.4	2603	5	1,325.0	1,230.0	794.0			
2603.4	2603	8				0.33	44.85	
2603	2602	5	1,230.0	1,175.0	1,365.0			
2603	2602	8				0.25	41.75	
2602	2601	5	1,175.0	1,135.0	1,135.0			
2602	2601	8				0.25	36.58	
2601	26	5	1,135.0	970.0	1,405.0			
2601	26	8				0.38	32.13	
							174.25	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 26                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR26.DAT
  TIME/DATE OF STUDY: 13:32 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2604.00 TO NODE   2603.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4210
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1410.00
  DOWNSTREAM ELEVATION(FEET) =   1395.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.913
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      4.58
TOTAL AREA(ACRES) =      1.18   TOTAL RUNOFF(CFS) =      4.58

****************************************************************************
FLOW PROCESS FROM NODE   2603.80 TO NODE   2603.60 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1365.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      4.58
FLOW VELOCITY(FEET/SEC) =   2.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =   6.61
LONGEST FLOWPATH FROM NODE   2604.00 TO NODE   2603.60 =   375.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2603.80 TO NODE   2603.60 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.699
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4470
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4398
SUBAREA AREA(ACRES) =    3.09   SUBAREA RUNOFF(CFS) =   10.63
TOTAL AREA(ACRES) =      4.27   TOTAL RUNOFF(CFS) =   14.46
TC(MIN.) =   6.61

****************************************************************************
FLOW PROCESS FROM NODE   2603.60 TO NODE   2603.40 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1325.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0667
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0667 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =     14.46
FLOW VELOCITY(FEET/SEC) =   3.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.84   Tc(MIN.) =   9.46
LONGEST FLOWPATH FROM NODE   2604.00 TO NODE   2603.40 =   975.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2603.60 TO NODE   2603.40 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.114
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3230
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3493
SUBAREA AREA(ACRES) =   14.67   SUBAREA RUNOFF(CFS) =   28.97
TOTAL AREA(ACRES) =     18.94   TOTAL RUNOFF(CFS) =   40.45
TC(MIN.) =   9.46
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   2603.40 TO NODE   2603.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1325.00  DOWNSTREAM(FEET) =   1230.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   794.00   CHANNEL SLOPE =  0.1196
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1147 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     40.45
  FLOW VELOCITY(FEET/SEC) =   6.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =  11.49
  LONGEST FLOWPATH FROM NODE   2604.00 TO NODE   2603.00 =  1769.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2603.40 TO NODE   2603.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.392
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3290
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3350
  SUBAREA AREA(ACRES) =   44.85   SUBAREA RUNOFF(CFS) =   79.56
  TOTAL AREA(ACRES) =     63.79   TOTAL RUNOFF(CFS) =  115.23
  TC(MIN.) =  11.49

**************************************************************************
  FLOW PROCESS FROM NODE   2603.00 TO NODE   2602.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1175.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1365.00   CHANNEL SLOPE =  0.0403
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0403 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    115.23
  FLOW VELOCITY(FEET/SEC) =   5.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.17   Tc(MIN.) =  15.66
  LONGEST FLOWPATH FROM NODE   2604.00 TO NODE   2602.00 =  3134.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2603.00 TO NODE   2602.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.416
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2550
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3034
  SUBAREA AREA(ACRES) =   41.75   SUBAREA RUNOFF(CFS) =   47.02
  TOTAL AREA(ACRES) =    105.54   TOTAL RUNOFF(CFS) =  141.41
  TC(MIN.) =  15.66

**************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2601.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =   1135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1135.00   CHANNEL SLOPE =  0.0352
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0352 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    141.41
  FLOW VELOCITY(FEET/SEC) =   5.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.46   Tc(MIN.) =  19.12
  LONGEST FLOWPATH FROM NODE   2604.00 TO NODE   2601.00 =  4269.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2601.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.883
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2896
  SUBAREA AREA(ACRES) =   36.58   SUBAREA RUNOFF(CFS) =   35.51
  TOTAL AREA(ACRES) =    142.12   TOTAL RUNOFF(CFS) =  159.83
  TC(MIN.) =  19.12

****************************************************************************
  FLOW PROCESS FROM NODE   2601.00 TO NODE     26.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    970.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1405.00   CHANNEL SLOPE =  0.1174
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1131 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    159.83
  FLOW VELOCITY(FEET/SEC) =  10.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.30   Tc(MIN.) =  21.41
  LONGEST FLOWPATH FROM NODE   2604.00 TO NODE     26.00 =  5674.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2601.00 TO NODE     26.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.609
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3063
  SUBAREA AREA(ACRES) =   32.13   SUBAREA RUNOFF(CFS) =   44.06
  TOTAL AREA(ACRES) =    174.25   TOTAL RUNOFF(CFS) =  192.62
  TC(MIN.) =  21.41
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    174.25  TC(MIN.) =     21.41
  PEAK FLOW RATE(CFS)   =    192.62
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

FUSCOE ENGINEERING
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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR27

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2775	2774	2	1,540.0	1,520.0	75.0	0.35	0.55	
2774	2773	5	1,520.0	1,480.0	300.0			
2774	2773	8				0.35	2.97	
2773	2772	5	1,480.0	1,415.0	600.0			
2773	2772	8				0.35	10.84	
2772	2771	5	1,415.0	1,300.0	587.0			
2772	2771	8				0.34	11.52	
2771	2771	1						1 of 3
2782	2781	2	1,595.0	1,565.0	75.0	0.35	0.22	
2781	2780	5	1,565.0	1,375.0	783.7			
2781	2780	8				0.34	4.37	
2780	2771	5	1,375.0	1,300.0	515.9			
2780	2771	8				0.28	2.61	
2771	2771	1						2 of 3
2792	2791	2	1,405.0	1,400.0	75.0	0.35	0.52	
2791	2790	5	1,400.0	1,350.0	300.0			
2791	2790	8				0.28	2.06	
2790	2771	5	1,350.0	1,300.0	425.0			
2790	2771	8				0.25	3.49	
2771	2771	1						3 of 3
2771	2770	5	1,300.0	1,135.0	1,408.4			
2771	2770	8				0.30	28.14	
2770	2761	5	1,135.0	1,040.0	670.0			
2770	2761	8				0.25	8.96	
2761	2761	1						1 of 2
2765	2764	2	1,445.0	1,435.0	75.0	0.25	0.14	
2764	2763	5	1,435.0	1,395.0	300.0			
2764	2763	8				0.25	1.76	
2763	2762	5	1,395.0	1,305.0	585.0			
2763	2762	8				0.25	5.55	
2762	2761	5	1,305.0	1,040.0	1,335.0			
2762	2761	8				0.25	16.86	
2761	2761	1						2 of 2
2761	2760	5	1,040.0	970.0	1,200.0			
2761	2760	8				0.28	21.22	
2760	2740	5	970.0	930.0	930.0			
2760	2740	8				0.29	16.81	
2740	2740	1						1 of 2
2752	2751	2	1,155.0	1,140.0	75.0	0.25	0.16	
2751	2750	5	1,140.0	1,035.0	440.0			
2751	2750	8				0.25	14.39	
2750	2740	5	1,035.0	930.0	990.0			
2750	2740	8				0.26	14.22	
2740	2740	1						2 of 2

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Job Name:
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Date:
October 2006

Job #:
2469.01A

Run Name:
MERR27

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Friction Coeff.	Area (ac.)	Comments
2740	27	5	930.0	920.0	385.0			
2740	27	8				0.33	3.57	
27	27	10						Bank 1
2722	2721	2	1,300.0	1,295.0	75.0	0.25	0.31	
2721	2720	5	1,295.0	1,230.0	430.0			
2721	2720	8				0.25	6.42	
2720	2710	5	1,230.0	1,170.0	650.0			
2720	2710	8				0.25	18.32	
2710	2710	1						
2732	2731	2	1,450.0	1,445.0	90.0	0.25	0.35	
2731	2730	5	1,445.0	1,390.0	305.0			
2731	2730	8				0.25	1.97	
2730	2710	5	1,390.0	1,170.0	820.0			
2730	2710	8				0.25	8.79	
2710	2710	1						
2710	2710.5	5	1,170.0	1,105.0	600.0			
2710	2710.5	8				0.25	10.99	
2710.5	27	5	1,105.0	920.0	1,420.0			
2710.5	27	8				0.26	18.2	
27	27	11						Add to Bank 1
							236.28	Total Area


```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC.
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                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 27                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR27.DAT
  TIME/DATE OF STUDY: 16:30 10/02/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2775.00 TO NODE   2774.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1540.00
  DOWNSTREAM ELEVATION(FEET) =   1520.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
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 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      1.68
 TOTAL AREA(ACRES) =      0.55   TOTAL RUNOFF(CFS) =      1.68

****************************************************************************
 FLOW PROCESS FROM NODE   2774.00 TO NODE   2773.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1520.00  DOWNSTREAM(FEET) =   1480.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1333
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1239 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.68
 FLOW VELOCITY(FEET/SEC) =   2.34 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =   7.56
 LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2773.00 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2774.00 TO NODE   2773.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.063
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    2.97   SUBAREA RUNOFF(CFS) =    7.34
 TOTAL AREA(ACRES) =      3.52   TOTAL RUNOFF(CFS) =    8.70
 TC(MIN.) =   7.56

****************************************************************************
 FLOW PROCESS FROM NODE   2773.00 TO NODE   2772.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1480.00  DOWNSTREAM(FEET) =   1415.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1083
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1063 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.70
 FLOW VELOCITY(FEET/SEC) =   3.75 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.67   Tc(MIN.) =  10.23
 LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2772.00 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2773.00 TO NODE   2772.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.813
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =   10.84   SUBAREA RUNOFF(CFS) =   22.05
 TOTAL AREA(ACRES) =     14.36   TOTAL RUNOFF(CFS) =   29.22
 TC(MIN.) =  10.23

****************************************************************************
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```
 FLOW PROCESS FROM NODE   2772.00 TO NODE   2771.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1415.00  DOWNSTREAM(FEET) =   1300.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   587.00   CHANNEL SLOPE =  0.1959
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1580 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     29.22
 FLOW VELOCITY(FEET/SEC) =   6.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.43   Tc(MIN.) =  11.65
 LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2771.00 =  1562.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2772.00 TO NODE   2771.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.343
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3455
 SUBAREA AREA(ACRES) =   11.52   SUBAREA RUNOFF(CFS) =   20.93
 TOTAL AREA(ACRES) =     25.88   TOTAL RUNOFF(CFS) =   47.78
 TC(MIN.) =  11.65

****************************************************************************
 FLOW PROCESS FROM NODE   2771.00 TO NODE   2771.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  11.65
 RAINFALL INTENSITY(INCH/HR) =   5.34
 TOTAL STREAM AREA(ACRES) =    25.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     47.78

****************************************************************************
 FLOW PROCESS FROM NODE   2782.00 TO NODE   2781.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
 UPSTREAM ELEVATION(FEET) =   1595.00
 DOWNSTREAM ELEVATION(FEET) =   1565.00
 ELEVATION DIFFERENCE(FEET) =     30.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.67
 TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
 FLOW PROCESS FROM NODE   2781.00 TO NODE   2780.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1565.00  DOWNSTREAM(FEET) =   1375.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   783.70   CHANNEL SLOPE =  0.2424
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1775 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.67
  FLOW VELOCITY(FEET/SEC) =   2.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.54   Tc(MIN.) =  10.96
  LONGEST FLOWPATH FROM NODE   2782.00 TO NODE   2780.00 =   858.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2781.00 TO NODE   2780.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.557
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3405
  SUBAREA AREA(ACRES) =    4.37   SUBAREA RUNOFF(CFS) =    8.26
  TOTAL AREA(ACRES) =      4.59   TOTAL RUNOFF(CFS) =    8.69
  TC(MIN.) =  10.96

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2771.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1375.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   515.90   CHANNEL SLOPE =  0.1454
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1319 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      8.69
  FLOW VELOCITY(FEET/SEC) =   4.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =  13.02
  LONGEST FLOWPATH FROM NODE   2782.00 TO NODE   2771.00 =  1374.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2771.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.974
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3186
  SUBAREA AREA(ACRES) =    2.61   SUBAREA RUNOFF(CFS) =    3.63
  TOTAL AREA(ACRES) =      7.20   TOTAL RUNOFF(CFS) =   11.41
  TC(MIN.) =  13.02

****************************************************************************
  FLOW PROCESS FROM NODE   2771.00 TO NODE   2771.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.02
  RAINFALL INTENSITY(INCH/HR) =   4.97
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  TOTAL STREAM AREA(ACRES) =     7.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.41

****************************************************************************
  FLOW PROCESS FROM NODE   2792.00 TO NODE   2791.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1405.00
  DOWNSTREAM ELEVATION(FEET) =   1400.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.212
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.017
  SUBAREA RUNOFF(CFS) =      1.46
  TOTAL AREA(ACRES) =      0.52   TOTAL RUNOFF(CFS) =      1.46

****************************************************************************
  FLOW PROCESS FROM NODE   2791.00 TO NODE   2790.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1400.00  DOWNSTREAM(FEET) =   1350.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1667
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1433 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      1.46
  FLOW VELOCITY(FEET/SEC) =   2.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.08   Tc(MIN.) =   8.29
  LONGEST FLOWPATH FROM NODE   2792.00 TO NODE   2790.00 =   375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2791.00 TO NODE   2790.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.654
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2941
  SUBAREA AREA(ACRES) =    2.06   SUBAREA RUNOFF(CFS) =    3.84
  TOTAL AREA(ACRES) =      2.58   TOTAL RUNOFF(CFS) =    5.05
  TC(MIN.) =   8.29

****************************************************************************
  FLOW PROCESS FROM NODE   2790.00 TO NODE   2771.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   425.00   CHANNEL SLOPE =  0.1176
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1132 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      5.05
  FLOW VELOCITY(FEET/SEC) =   3.23 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.19   Tc(MIN.) =  10.48
  LONGEST FLOWPATH FROM NODE   2792.00 TO NODE   2771.00 =   800.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2790.00 TO NODE   2771.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.720
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2687
  SUBAREA AREA(ACRES) =    3.49   SUBAREA RUNOFF(CFS) =    4.99
  TOTAL AREA(ACRES) =      6.07   TOTAL RUNOFF(CFS) =    9.33
  TC(MIN.) =  10.48

****************************************************************************
  FLOW PROCESS FROM NODE   2771.00 TO NODE   2771.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.48
  RAINFALL INTENSITY(INCH/HR) =   5.72
  TOTAL STREAM AREA(ACRES) =     6.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       47.78    11.65        5.343         25.88
      2       11.41    13.02        4.974          7.20
      3        9.33    10.48        5.720          6.07

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       61.50    10.48       5.720
      2       66.70    11.65       5.343
      3       64.00    13.02       4.974

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     66.70   Tc(MIN.) =   11.65
  TOTAL AREA(ACRES) =     39.15
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2771.00 =  1562.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2771.00 TO NODE   2770.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1408.40   CHANNEL SLOPE =  0.1172
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1129 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     66.70
  FLOW VELOCITY(FEET/SEC) =   7.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.08   Tc(MIN.) =  14.73
```

```
 LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2770.00 =  2970.40 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2771.00 TO NODE   2770.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.593
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3167
 SUBAREA AREA(ACRES) =   28.14   SUBAREA RUNOFF(CFS) =   38.77
 TOTAL AREA(ACRES) =     67.29   TOTAL RUNOFF(CFS) =   97.87
 TC(MIN.) =  14.73

****************************************************************************
 FLOW PROCESS FROM NODE   2770.00 TO NODE   2761.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =   1040.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   670.00   CHANNEL SLOPE =  0.1418
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     97.87
 FLOW VELOCITY(FEET/SEC) =   9.27 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =  15.94
 LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2761.00 =  3640.40 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2770.00 TO NODE   2761.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.366
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3088
 SUBAREA AREA(ACRES) =    8.96   SUBAREA RUNOFF(CFS) =    9.78
 TOTAL AREA(ACRES) =     76.25   TOTAL RUNOFF(CFS) =  102.81
 TC(MIN.) =  15.94

****************************************************************************
 FLOW PROCESS FROM NODE   2761.00 TO NODE   2761.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.94
 RAINFALL INTENSITY(INCH/HR) =   4.37
 TOTAL STREAM AREA(ACRES) =    76.25
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    102.81

****************************************************************************
 FLOW PROCESS FROM NODE   2765.00 TO NODE   2764.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
```

```
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1445.00
  DOWNSTREAM ELEVATION(FEET) =   1435.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE   2764.00 TO NODE   2763.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1435.00  DOWNSTREAM(FEET) =   1395.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1333
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1239 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.28
  FLOW VELOCITY(FEET/SEC) =   1.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.54   Tc(MIN.) =   8.69
  LONGEST FLOWPATH FROM NODE   2765.00 TO NODE   2763.00 =   375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2764.00 TO NODE   2763.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.457
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    1.76   SUBAREA RUNOFF(CFS) =    2.84
  TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =    3.07
  TC(MIN.) =   8.69

****************************************************************************
  FLOW PROCESS FROM NODE   2763.00 TO NODE   2762.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1305.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   585.00   CHANNEL SLOPE =  0.1538
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1369 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      3.07
  FLOW VELOCITY(FEET/SEC) =   3.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.24   Tc(MIN.) =  11.93
  LONGEST FLOWPATH FROM NODE   2765.00 TO NODE   2762.00 =   960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2763.00 TO NODE   2762.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.264
```

```
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    5.55   SUBAREA RUNOFF(CFS) =    7.30
  TOTAL AREA(ACRES) =      7.45   TOTAL RUNOFF(CFS) =    9.80
  TC(MIN.) =  11.93

****************************************************************************
  FLOW PROCESS FROM NODE   2762.00 TO NODE   2761.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =   1040.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1335.00   CHANNEL SLOPE =  0.1985
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1593 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      9.80
  FLOW VELOCITY(FEET/SEC) =   4.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.66   Tc(MIN.) =  16.58
  LONGEST FLOWPATH FROM NODE   2765.00 TO NODE   2761.00 =  2295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2762.00 TO NODE   2761.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.256
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   16.86   SUBAREA RUNOFF(CFS) =   17.94
  TOTAL AREA(ACRES) =     24.31   TOTAL RUNOFF(CFS) =   25.86
  TC(MIN.) =  16.58

****************************************************************************
  FLOW PROCESS FROM NODE   2761.00 TO NODE   2761.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.58
  RAINFALL INTENSITY(INCH/HR) =   4.26
  TOTAL STREAM AREA(ACRES) =    24.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.86

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      102.81    15.94        4.366         76.25
      2       25.86    16.58        4.256         24.31

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      127.67    15.94        4.366
```

```
     2      126.08    16.58       4.256

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    127.67   Tc(MIN.) =   15.94
  TOTAL AREA(ACRES) =    100.56
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2761.00 =  3640.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2761.00 TO NODE   5760.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1040.00  DOWNSTREAM(FEET) =    970.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1200.00   CHANNEL SLOPE =  0.0583
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0583 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    127.67
  FLOW VELOCITY(FEET/SEC) =   6.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =  18.88
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   5760.00 =  4840.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2761.00 TO NODE   2760.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.914
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2921
  SUBAREA AREA(ACRES) =   21.22   SUBAREA RUNOFF(CFS) =   23.26
  TOTAL AREA(ACRES) =    121.78   TOTAL RUNOFF(CFS) =  139.22
  TC(MIN.) =  18.88

****************************************************************************
  FLOW PROCESS FROM NODE   2760.00 TO NODE   2740.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    970.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.0430
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0430 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    139.22
  FLOW VELOCITY(FEET/SEC) =   6.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =  21.46
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2740.00 =  5770.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2760.00 TO NODE   2740.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.604
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2918
  SUBAREA AREA(ACRES) =   16.81   SUBAREA RUNOFF(CFS) =   17.57
  TOTAL AREA(ACRES) =    138.59   TOTAL RUNOFF(CFS) =  145.75
```

```
  TC(MIN.) =  21.46

****************************************************************************
  FLOW PROCESS FROM NODE   2740.00 TO NODE   2740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  21.46
  RAINFALL INTENSITY(INCH/HR) =   3.60
  TOTAL STREAM AREA(ACRES) =   138.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    145.75

****************************************************************************
  FLOW PROCESS FROM NODE   2752.00 TO NODE   2751.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1155.00
  DOWNSTREAM ELEVATION(FEET) =   1140.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE   2751.00 TO NODE   2750.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =   1035.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.2386
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1762 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.32
  FLOW VELOCITY(FEET/SEC) =   2.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =   9.27
  LONGEST FLOWPATH FROM NODE   2752.00 TO NODE   2750.00 =   515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2751.00 TO NODE   2750.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.193
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   14.39   SUBAREA RUNOFF(CFS) =   22.28
  TOTAL AREA(ACRES) =     14.55   TOTAL RUNOFF(CFS) =   22.53
  TC(MIN.) =   9.27

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2750.00 TO NODE   2740.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   990.00   CHANNEL SLOPE =  0.1061
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1045 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     22.53
  FLOW VELOCITY(FEET/SEC) =   5.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.23   Tc(MIN.) =  12.50
  LONGEST FLOWPATH FROM NODE   2752.00 TO NODE   2740.00 =  1505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2750.00 TO NODE   2740.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.107
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2549
  SUBAREA AREA(ACRES) =   14.22   SUBAREA RUNOFF(CFS) =   18.88
  TOTAL AREA(ACRES) =     28.77   TOTAL RUNOFF(CFS) =   37.46
  TC(MIN.) =  12.50

****************************************************************************
  FLOW PROCESS FROM NODE   2740.00 TO NODE   2740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.50
  RAINFALL INTENSITY(INCH/HR) =   5.11
  TOTAL STREAM AREA(ACRES) =    28.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      145.75    21.46        3.604        138.59
      2       37.46    12.50        5.107         28.77

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      140.31    12.50       5.107
      2      172.18    21.46       3.604

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    172.18   Tc(MIN.) =   21.46
  TOTAL AREA(ACRES) =    167.36
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2740.00 =  5770.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2740.00 TO NODE     27.00 IS CODE =  53
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    930.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00   CHANNEL SLOPE =  0.0260
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0260 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    172.18
  FLOW VELOCITY(FEET/SEC) =   5.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =  22.74
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE     27.00 =  6155.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2740.00 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.471
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2864
  SUBAREA AREA(ACRES) =    3.57   SUBAREA RUNOFF(CFS) =    4.09
  TOTAL AREA(ACRES) =    170.93   TOTAL RUNOFF(CFS) =  172.18
  TC(MIN.) =  22.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2722.00 TO NODE   2721.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1300.00
  DOWNSTREAM ELEVATION(FEET) =   1295.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.041
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.395
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2721.00 TO NODE   2720.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1230.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.1512
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1356 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.57
```

```
  FLOW VELOCITY(FEET/SEC) =   2.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.48   Tc(MIN.) =  10.52
  LONGEST FLOWPATH FROM NODE   2722.00 TO NODE   2720.00 =   505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2721.00 TO NODE   2720.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.709
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    6.42   SUBAREA RUNOFF(CFS) =    9.16
  TOTAL AREA(ACRES) =      6.73   TOTAL RUNOFF(CFS) =    9.60
  TC(MIN.) =  10.52

****************************************************************************
  FLOW PROCESS FROM NODE   2720.00 TO NODE   2710.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1170.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.0923
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0923 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      9.60
  FLOW VELOCITY(FEET/SEC) =   3.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.00   Tc(MIN.) =  13.51
  LONGEST FLOWPATH FROM NODE   2722.00 TO NODE   2710.00 =  1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2720.00 TO NODE   2710.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.856
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   18.32   SUBAREA RUNOFF(CFS) =   22.24
  TOTAL AREA(ACRES) =     25.05   TOTAL RUNOFF(CFS) =   30.41
  TC(MIN.) =  13.51

****************************************************************************
  FLOW PROCESS FROM NODE   2710.00 TO NODE   2710.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.51
  RAINFALL INTENSITY(INCH/HR) =   4.86
  TOTAL STREAM AREA(ACRES) =    25.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.41

****************************************************************************
  FLOW PROCESS FROM NODE   2732.00 TO NODE   2731.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1450.00
  DOWNSTREAM ELEVATION(FEET) =   1445.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.196
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.705
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.35   TOTAL RUNOFF(CFS) =      0.59

**************************************************************************
  FLOW PROCESS FROM NODE   2731.00 TO NODE   2730.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1445.00  DOWNSTREAM(FEET) =   1390.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.1803
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1502 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.59
  FLOW VELOCITY(FEET/SEC) =   2.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.34   Tc(MIN.) =  10.54
  LONGEST FLOWPATH FROM NODE   2732.00 TO NODE   2730.00 =   395.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2731.00 TO NODE   2730.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.701
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    1.97   SUBAREA RUNOFF(CFS) =    2.81
  TOTAL AREA(ACRES) =      2.32   TOTAL RUNOFF(CFS) =    3.31
  TC(MIN.) =  10.54

**************************************************************************
  FLOW PROCESS FROM NODE   2730.00 TO NODE   2710.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1390.00  DOWNSTREAM(FEET) =   1170.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   820.00   CHANNEL SLOPE =  0.2683
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1861 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      3.31
  FLOW VELOCITY(FEET/SEC) =   3.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.80   Tc(MIN.) =  14.34
  LONGEST FLOWPATH FROM NODE   2732.00 TO NODE   2710.00 =  1215.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2730.00 TO NODE   2710.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.674
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    8.79   SUBAREA RUNOFF(CFS) =   10.27
 TOTAL AREA(ACRES) =     11.11   TOTAL RUNOFF(CFS) =   12.98
 TC(MIN.) =  14.34

****************************************************************************
 FLOW PROCESS FROM NODE   2710.00 TO NODE   2710.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.34
 RAINFALL INTENSITY(INCH/HR) =   4.67
 TOTAL STREAM AREA(ACRES) =    11.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.98

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       30.41    13.51        4.856         25.05
     2       12.98    14.34        4.674         11.11

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       42.65    13.51       4.856
     2       42.26    14.34       4.674

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     42.65   Tc(MIN.) =   13.51
 TOTAL AREA(ACRES) =     36.16
 LONGEST FLOWPATH FROM NODE   2732.00 TO NODE   2710.00 =  1215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2710.00 TO NODE   2710.50 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1170.00  DOWNSTREAM(FEET) =   1105.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1083
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1063 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     42.65
 FLOW VELOCITY(FEET/SEC) =   6.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =  15.08
 LONGEST FLOWPATH FROM NODE   2732.00 TO NODE   2710.50 =  1815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2710.00 TO NODE   2710.50 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.524
```

```
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   10.99   SUBAREA RUNOFF(CFS) =   12.43
  TOTAL AREA(ACRES) =     47.15   TOTAL RUNOFF(CFS) =   53.32
  TC(MIN.) =  15.08

****************************************************************************
  FLOW PROCESS FROM NODE   2710.50 TO NODE     27.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.1303
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1219 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     53.32
  FLOW VELOCITY(FEET/SEC) =   7.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.22   Tc(MIN.) =  18.30
  LONGEST FLOWPATH FROM NODE   2732.00 TO NODE     27.00 =  3235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2710.50 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.993
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2528
  SUBAREA AREA(ACRES) =   18.20   SUBAREA RUNOFF(CFS) =   18.89
  TOTAL AREA(ACRES) =     65.35   TOTAL RUNOFF(CFS) =   65.96
  TC(MIN.) =  18.30

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1       65.96    18.30        3.993       65.35
  LONGEST FLOWPATH FROM NODE   2732.00 TO NODE     27.00 =  3235.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1      172.18    22.74        3.471      170.93
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE     27.00 =  6155.40 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     204.56      18.30        3.993
      2     229.53      22.74        3.471

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    229.53   Tc(MIN.) =   22.74
```

```
  TOTAL AREA(ACRES) =    236.28
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    236.28  TC(MIN.) =     22.74
  PEAK FLOW RATE(CFS)   =    229.53
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Existing Condition

BASIN D

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

Job Name:
Newland Sierra - Existing Hydrology

Date:
January 2017

Job #:
2469.01A

Run Name:
MERR28.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2823	2822	2	1,702.0	1,695.0	100.0	0.35	0.33	
2822	2821	5	1,695.0	1,430.0	517.0			
2822	2821	8				0.35	3.06	
2821	2820	5	1,430.0	1,265.0	669.0			
2821	2820	8				0.32	11.46	
2820	2811	5	1,265.0	1,145.0	650.0			
2820	2811	8				0.28	8.25	
2812	2811	8				0.30	9.5	
2811	2810	5	1,145.0	1,045.0	611.0			
2811	2810	8				0.25	9.27	
2810	28	5	1,045.0	975.0	671.0			
2810	28	8				0.29	11.8	
28	28	1						1 of 2
2807	2806	2	1,738.0	1,705.0	106.0	0.35	0.28	
2806	2805	5	1,705.0	1,500.0	455.0			
2806	2805	8				0.35	3.49	
2805	2804	5	1,500.0	1,200.0	1,117.0			
2805	2804	8				0.30	16.91	
2804	2803	5	1,200.0	1,073.0	885.0			
2804	2803	8				0.25	11.28	
2803	2801	5	1,073.0	985.0	558.0			
2803	2801	8				0.30	5.72	
2802	2801	8				0.29	16.01	
2801	28	5	985.0	975.0	360.0			
28	28	1						2 of 2
							107.36	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - EXISTING HYDROLOGY                                    *
* SUBBASIN # 28                                                          *
* JANUARY 2017                                                           *
 ************************************************************************

  FILE NAME: MERR28.DAT
  TIME/DATE OF STUDY: 09:07 01/30/2017
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2823.00 TO NODE   2822.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1702.00
  DOWNSTREAM ELEVATION(FEET) =   1695.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.058
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.383
  SUBAREA RUNOFF(CFS) =      0.85
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      0.85

****************************************************************************
  FLOW PROCESS FROM NODE   2822.00 TO NODE   2821.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1695.00  DOWNSTREAM(FEET) =   1430.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   517.00   CHANNEL SLOPE =  0.5126
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2256 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.85
  FLOW VELOCITY(FEET/SEC) =   2.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.24   Tc(MIN.) =   10.30
  LONGEST FLOWPATH FROM NODE   2823.00 TO NODE   2821.00 =     617.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2822.00 TO NODE   2821.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.787
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    3.06   SUBAREA RUNOFF(CFS) =    6.20
  TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =       6.87
  TC(MIN.) =   10.30
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2821.00 TO NODE   2820.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1430.00  DOWNSTREAM(FEET) =   1265.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.00   CHANNEL SLOPE =  0.2466
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1789 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       6.87
  FLOW VELOCITY(FEET/SEC) =   4.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.48   Tc(MIN.) =   12.78
  LONGEST FLOWPATH FROM NODE   2823.00 TO NODE   2820.00 =    1286.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2821.00 TO NODE   2820.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.035
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3268
  SUBAREA AREA(ACRES) =   11.46   SUBAREA RUNOFF(CFS) =   18.47
  TOTAL AREA(ACRES) =       14.9   TOTAL RUNOFF(CFS) =      24.44
  TC(MIN.) =   12.78

****************************************************************************
  FLOW PROCESS FROM NODE   2820.00 TO NODE   2811.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1265.00  DOWNSTREAM(FEET) =   1145.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.1846
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1523 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      24.44
  FLOW VELOCITY(FEET/SEC) =   6.34 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   14.49
  LONGEST FLOWPATH FROM NODE   2823.00 TO NODE   2811.00 =    1936.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2820.00 TO NODE   2811.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.643
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3101
  SUBAREA AREA(ACRES) =    8.25   SUBAREA RUNOFF(CFS) =   10.73
  TOTAL AREA(ACRES) =       23.1   TOTAL RUNOFF(CFS) =      33.26
  TC(MIN.) =   14.49

****************************************************************************
  FLOW PROCESS FROM NODE   2812.00 TO NODE   2811.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.643
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3072
  SUBAREA AREA(ACRES) =    9.50   SUBAREA RUNOFF(CFS) =   13.23
  TOTAL AREA(ACRES) =       32.6   TOTAL RUNOFF(CFS) =      46.50
  TC(MIN.) =   14.49

****************************************************************************
  FLOW PROCESS FROM NODE   2811.00 TO NODE   2810.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =   1045.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   611.00   CHANNEL SLOPE =  0.1637
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1418 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      46.50
  FLOW VELOCITY(FEET/SEC) =   7.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =   15.83
  LONGEST FLOWPATH FROM NODE   2823.00 TO NODE   2810.00 =    2547.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2811.00 TO NODE   2810.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.385
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2945
  SUBAREA AREA(ACRES) =    9.27   SUBAREA RUNOFF(CFS) =   10.16
  TOTAL AREA(ACRES) =       41.9   TOTAL RUNOFF(CFS) =      54.07
  TC(MIN.) =   15.83

****************************************************************************
  FLOW PROCESS FROM NODE   2810.00 TO NODE     28.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1045.00  DOWNSTREAM(FEET) =    975.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   671.00   CHANNEL SLOPE =  0.1043
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1032 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      54.07
  FLOW VELOCITY(FEET/SEC) =   6.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.65   Tc(MIN.) =   17.48
  LONGEST FLOWPATH FROM NODE   2823.00 TO NODE     28.00 =    3218.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2810.00 TO NODE     28.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.114
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2890
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2933
  SUBAREA AREA(ACRES) =   11.80   SUBAREA RUNOFF(CFS) =   14.03
  TOTAL AREA(ACRES) =       53.7   TOTAL RUNOFF(CFS) =      64.76
  TC(MIN.) =   17.48

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.48
  RAINFALL INTENSITY(INCH/HR) =   4.11
  TOTAL STREAM AREA(ACRES) =    53.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     64.76

****************************************************************************
  FLOW PROCESS FROM NODE   2807.00 TO NODE   2806.00 IS CODE =  21
```

```
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   106.00
  UPSTREAM ELEVATION(FEET) =   1738.00
  DOWNSTREAM ELEVATION(FEET) =   1705.00
  ELEVATION DIFFERENCE(FEET) =     33.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.78

************************************************************************
  FLOW PROCESS FROM NODE   2806.00 TO NODE   2805.00 IS CODE =  53
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1705.00  DOWNSTREAM(FEET) =   1500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.4505
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2201 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.78
  FLOW VELOCITY(FEET/SEC) =   2.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =    9.15
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2805.00 =     561.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   2806.00 TO NODE   2805.00 IS CODE =  81
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.243
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    3.49   SUBAREA RUNOFF(CFS) =    7.63
  TOTAL AREA(ACRES) =        3.8   TOTAL RUNOFF(CFS) =       8.24
  TC(MIN.) =    9.15
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2805.00 TO NODE   2804.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1200.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1117.00   CHANNEL SLOPE =  0.2686
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1862 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.24
  FLOW VELOCITY(FEET/SEC) =   4.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.82   Tc(MIN.) =   12.97
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2804.00 =    1678.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2805.00 TO NODE   2804.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.986
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3091
  SUBAREA AREA(ACRES) =   16.91   SUBAREA RUNOFF(CFS) =   25.30
  TOTAL AREA(ACRES) =       20.7   TOTAL RUNOFF(CFS) =      31.88
  TC(MIN.) =   12.97

****************************************************************************
  FLOW PROCESS FROM NODE   2804.00 TO NODE   2803.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1073.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   885.00   CHANNEL SLOPE =  0.1435
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1307 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      31.88
  FLOW VELOCITY(FEET/SEC) =   6.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.30   Tc(MIN.) =   15.27
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2803.00 =    2563.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2804.00 TO NODE   2803.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.488
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2883
  SUBAREA AREA(ACRES) =   11.28   SUBAREA RUNOFF(CFS) =   12.66
  TOTAL AREA(ACRES) =       32.0   TOTAL RUNOFF(CFS) =      41.34
  TC(MIN.) =   15.27

****************************************************************************
  FLOW PROCESS FROM NODE     28.03 TO NODE   2801.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1073.00  DOWNSTREAM(FEET) =    985.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   558.00   CHANNEL SLOPE =  0.1577
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1389 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      41.34
  FLOW VELOCITY(FEET/SEC) =   7.21 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   16.56
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2801.00 =    3121.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2803.00 TO NODE   2801.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.259
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2900
  SUBAREA AREA(ACRES) =    5.72   SUBAREA RUNOFF(CFS) =    7.31
  TOTAL AREA(ACRES) =       37.7   TOTAL RUNOFF(CFS) =      46.55
  TC(MIN.) =   16.56

****************************************************************************
  FLOW PROCESS FROM NODE   2802.00 TO NODE   2801.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.259
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2860
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2888
  SUBAREA AREA(ACRES) =   16.01   SUBAREA RUNOFF(CFS) =   19.50
  TOTAL AREA(ACRES) =       53.7   TOTAL RUNOFF(CFS) =      66.05
  TC(MIN.) =   16.56

****************************************************************************
  FLOW PROCESS FROM NODE   2801.00 TO NODE     28.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    985.00  DOWNSTREAM(FEET) =    975.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   360.00   CHANNEL SLOPE =  0.0278
  CHANNEL FLOW THRU SUBAREA(CFS) =      66.05
  FLOW VELOCITY(FEET/SEC) =   6.99 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.86   Tc(MIN.) =   17.42
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE     28.00 =    3481.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.42
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =    53.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     66.05

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       64.76    17.48        4.114         53.67
      2       66.05    17.42        4.123         53.69

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      130.60    17.42       4.123
      2      130.67    17.48       4.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =     130.67   Tc(MIN.) =   17.48
  TOTAL AREA(ACRES) =      107.4
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE     28.00 =    3481.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      107.4  TC(MIN.) =     17.48
  PEAK FLOW RATE(CFS)   =     130.67
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name: Merriam Mountains - Proposed Hydrology

Date: October 2006

Job #: 2469.01A

Run Name: MERR29

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2927	2926	2	1,603.0	1,570.0	100.0	0.35	0.19	
2926	2925	5	1,570.0	1,470.0	307.0			
2926	2925	8				0.35	1.15	
2925	2924	5	1,470.0	1,390.0	520.0			
2925	2924	8				0.35	6.88	
2924	2922	5	1,390.0	1,370.0	361.0			
2923	2922	8				0.35	9.3	
2922	2921	5	1,370.0	1,300.0	1,235.0			
2922	2921	8				0.43	29.57	
2921	2920	5	1,300.0	893.0	1,300.0			
2921	2920	8				0.44	15.07	
2920	29	5	893.0	800.0	335.0			
2920	29	8				0.46	27.04	
29	29	1						1 of 2
2915	2914	2	1,550.0	1,460.0	90.0	0.35	1.38	
2914	2913	5	1,460.0	1,400.0	400.0			
2914	2913	8				0.35	5.2	
2913	2912	5	1,400.0	1,290.0	600.0			
2913	2912	8				0.35	5.12	
2912	2911	5	1,290.0	1,025.0	1,175.0			
2912	2911	8				0.43	19.17	
2911	2910	5	1,025.0	835.0	830.0			
2911	2910	8				0.43	23.79	
2910	29	5	835.0	800.0	455.0			2 of 2
29	29	1						
							143.86	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC.
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 29                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR29.DAT
  TIME/DATE OF STUDY: 13:20 10/10/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2927.00 TO NODE   2926.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1603.00
  DOWNSTREAM ELEVATION(FEET) =   1570.00
  ELEVATION DIFFERENCE(FEET) =    33.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.53
 TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
 FLOW PROCESS FROM NODE   2926.00 TO NODE   2925.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1570.00  DOWNSTREAM(FEET) =   1470.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   307.00   CHANNEL SLOPE =  0.3257
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2010 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.53
 FLOW VELOCITY(FEET/SEC) =   2.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   8.30
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2925.00 =   407.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2926.00 TO NODE   2925.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.648
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    1.15   SUBAREA RUNOFF(CFS) =    2.68
 TOTAL AREA(ACRES) =      1.34   TOTAL RUNOFF(CFS) =    3.12
 TC(MIN.) =   8.30

****************************************************************************
 FLOW PROCESS FROM NODE   2925.00 TO NODE   2924.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1390.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.1538
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1369 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.12
 FLOW VELOCITY(FEET/SEC) =   3.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.86   Tc(MIN.) =  11.17
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2924.00 =   927.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2925.00 TO NODE   2924.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.491
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    6.88   SUBAREA RUNOFF(CFS) =   13.22
 TOTAL AREA(ACRES) =      8.22   TOTAL RUNOFF(CFS) =   15.80
 TC(MIN.) =  11.17
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   2924.00 TO NODE   2922.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1390.00  DOWNSTREAM(FEET) =   1370.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   361.00   CHANNEL SLOPE =  0.0554
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0554 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     15.80
  FLOW VELOCITY(FEET/SEC) =   3.30 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =  12.99
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2922.00 =  1288.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2923.00 TO NODE   2922.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.982
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3480
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3489
  SUBAREA AREA(ACRES) =    9.30   SUBAREA RUNOFF(CFS) =   16.12
  TOTAL AREA(ACRES) =     17.52   TOTAL RUNOFF(CFS) =   30.46
  TC(MIN.) =  12.99

**************************************************************************
  FLOW PROCESS FROM NODE   2922.00 TO NODE   2921.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1370.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1235.00   CHANNEL SLOPE =  0.0567
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0567 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     30.46
  FLOW VELOCITY(FEET/SEC) =   4.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.95   Tc(MIN.) =  17.94
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2921.00 =  2523.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2922.00 TO NODE   2921.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.045
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4290
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3992
  SUBAREA AREA(ACRES) =   29.57   SUBAREA RUNOFF(CFS) =   51.32
  TOTAL AREA(ACRES) =     47.09   TOTAL RUNOFF(CFS) =   76.05
  TC(MIN.) =  17.94

**************************************************************************
  FLOW PROCESS FROM NODE   2921.00 TO NODE   2920.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    893.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1300.00   CHANNEL SLOPE =  0.3131
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1983 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     76.05
  FLOW VELOCITY(FEET/SEC) =  10.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =  19.99
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2920.00 =  3823.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2921.00 TO NODE   2920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.772
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4091
  SUBAREA AREA(ACRES) =   15.07   SUBAREA RUNOFF(CFS) =   25.01
  TOTAL AREA(ACRES) =     62.16   TOTAL RUNOFF(CFS) =   95.92
  TC(MIN.) =  19.99

****************************************************************************
  FLOW PROCESS FROM NODE   2920.00 TO NODE     29.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    893.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.2776
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1892 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     95.92
  FLOW VELOCITY(FEET/SEC) =  11.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =  20.49
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE     29.00 =  4158.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2920.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.712
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4245
  SUBAREA AREA(ACRES) =   27.04   SUBAREA RUNOFF(CFS) =   46.17
  TOTAL AREA(ACRES) =     89.20   TOTAL RUNOFF(CFS) =  140.58
  TC(MIN.) =  20.49

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  20.49
  RAINFALL INTENSITY(INCH/HR) =   3.71
  TOTAL STREAM AREA(ACRES) =    89.20
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    140.58

****************************************************************************
 FLOW PROCESS FROM NODE   2915.00 TO NODE   2914.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
 UPSTREAM ELEVATION(FEET) =   1550.00
 DOWNSTREAM ELEVATION(FEET) =   1460.00
 ELEVATION DIFFERENCE(FEET) =     90.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.945
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.247
 SUBAREA RUNOFF(CFS) =      3.98
 TOTAL AREA(ACRES) =      1.38   TOTAL RUNOFF(CFS) =      3.98

****************************************************************************
 FLOW PROCESS FROM NODE   2914.00 TO NODE   2913.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1460.00  DOWNSTREAM(FEET) =   1400.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.1500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1350 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.98
 FLOW VELOCITY(FEET/SEC) =   3.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   7.99
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2913.00 =   490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2914.00 TO NODE   2913.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.816
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    5.20   SUBAREA RUNOFF(CFS) =   12.40
 TOTAL AREA(ACRES) =      6.58   TOTAL RUNOFF(CFS) =   15.70
 TC(MIN.) =   7.99

****************************************************************************
 FLOW PROCESS FROM NODE   2913.00 TO NODE   2912.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1400.00  DOWNSTREAM(FEET) =   1290.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1833
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1517 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     15.70
 FLOW VELOCITY(FEET/SEC) =   5.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =   9.82
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2912.00 =  1090.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2913.00 TO NODE   2912.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.965
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    5.12   SUBAREA RUNOFF(CFS) =   10.69
  TOTAL AREA(ACRES) =     11.70   TOTAL RUNOFF(CFS) =   24.43
  TC(MIN.) =   9.82

****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2911.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1290.00  DOWNSTREAM(FEET) =   1025.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.2255
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1718 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     24.43
  FLOW VELOCITY(FEET/SEC) =   6.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.91   Tc(MIN.) =  12.73
  LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2911.00 =  2265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2911.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.046
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4330
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4015
  SUBAREA AREA(ACRES) =   19.17   SUBAREA RUNOFF(CFS) =   41.89
  TOTAL AREA(ACRES) =     30.87   TOTAL RUNOFF(CFS) =   62.55
  TC(MIN.) =  12.73

****************************************************************************
  FLOW PROCESS FROM NODE   2911.00 TO NODE   2910.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00   CHANNEL SLOPE =  0.2289
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1730 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     62.55
  FLOW VELOCITY(FEET/SEC) =   9.23 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =  14.23
  LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2910.00 =  3095.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2911.00 TO NODE   2910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.697
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4250
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4118
 SUBAREA AREA(ACRES) =   23.79   SUBAREA RUNOFF(CFS) =   47.49
 TOTAL AREA(ACRES) =     54.66   TOTAL RUNOFF(CFS) =  105.70
 TC(MIN.) =  14.23

****************************************************************************
 FLOW PROCESS FROM NODE   2910.00 TO NODE     29.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    800.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.0769
 CHANNEL FLOW THRU SUBAREA(CFS) =    105.70
 FLOW VELOCITY(FEET/SEC) =  13.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.57   Tc(MIN.) =  14.80
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE     29.00 =  3550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.80
 RAINFALL INTENSITY(INCH/HR) =   4.58
 TOTAL STREAM AREA(ACRES) =    54.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    105.70

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      140.58    20.49        3.712         89.20
     2      105.70    14.80        4.580         54.66

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      207.21    14.80       4.580
     2      226.26    20.49       3.712

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    226.26   Tc(MIN.) =   20.49
 TOTAL AREA(ACRES) =    143.86
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE     29.00 =  4158.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    143.86  TC(MIN.) =     20.49
 PEAK FLOW RATE(CFS)   =    226.26
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name: Merriam Mountains - Proposed Hydrology

Date: October 2006

Job #: 2469.01A

Run Name: MERR30

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3006	3005	2	1,615.0	1,580.0	76.1	0.35	0.17	
3005	3004	5	1,580.0	1,360.0	465.9			
3005	3004	8				0.35	2.06	
3004	3003	5	1,360.0	1,210.0	558.5			
3004	3003	8				0.40	9.02	
3003	3002	5	1,210.0	1,080.0	596.6			
3003	3002	8				0.40	21.04	
3002	3001	5	1,080.0	870.0	870.8			
3002	3001	8				0.40	21.39	
3001	30	5	870.0	665.0	1,720.8			
3001	30	8				0.40	54.15	
							107.83	Total Area

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC.
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 30                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR30.DAT
  TIME/DATE OF STUDY: 10:33 10/06/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   3006.00 TO NODE   3005.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    76.06
  UPSTREAM ELEVATION(FEET) =   1615.00
  DOWNSTREAM ELEVATION(FEET) =   1580.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.465
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.707
 SUBAREA RUNOFF(CFS) =      0.52
 TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
 FLOW PROCESS FROM NODE   3005.00 TO NODE   3004.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1580.00  DOWNSTREAM(FEET) =   1360.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   465.90   CHANNEL SLOPE =  0.4722
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2222 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.52
 FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =   8.41
 LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   3004.00 =   541.96 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3005.00 TO NODE   3004.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.596
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    2.06   SUBAREA RUNOFF(CFS) =    4.76
 TOTAL AREA(ACRES) =      2.23   TOTAL RUNOFF(CFS) =    5.15
 TC(MIN.) =   8.41

****************************************************************************
 FLOW PROCESS FROM NODE   3004.00 TO NODE   3003.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1360.00  DOWNSTREAM(FEET) =   1210.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   558.50   CHANNEL SLOPE =  0.2686
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1862 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.15
 FLOW VELOCITY(FEET/SEC) =   4.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =  10.64
 LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   3003.00 =  1100.46 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3004.00 TO NODE   3003.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.666
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3901
 SUBAREA AREA(ACRES) =    9.02   SUBAREA RUNOFF(CFS) =   20.44
 TOTAL AREA(ACRES) =     11.25   TOTAL RUNOFF(CFS) =   24.87
 TC(MIN.) =  10.64
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   3003.00 TO NODE   3002.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1210.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   596.60   CHANNEL SLOPE =  0.2179
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1690 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     24.87
  FLOW VELOCITY(FEET/SEC) =   6.71 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =  12.12
  LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   3002.00 =  1697.06 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   3003.00 TO NODE   3002.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.209
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3965
  SUBAREA AREA(ACRES) =   21.04   SUBAREA RUNOFF(CFS) =   43.84
  TOTAL AREA(ACRES) =     32.29   TOTAL RUNOFF(CFS) =   66.70
  TC(MIN.) =  12.12

**************************************************************************
  FLOW PROCESS FROM NODE   3002.00 TO NODE   2001.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   870.80   CHANNEL SLOPE =  0.2412
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1771 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     66.70
  FLOW VELOCITY(FEET/SEC) =   9.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =  13.64
  LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   2001.00 =  2567.86 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   3002.00 TO NODE   3001.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.827
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3979
  SUBAREA AREA(ACRES) =   21.39   SUBAREA RUNOFF(CFS) =   41.30
  TOTAL AREA(ACRES) =     53.68   TOTAL RUNOFF(CFS) =  103.10
  TC(MIN.) =  13.64

**************************************************************************
  FLOW PROCESS FROM NODE   3001.00 TO NODE     30.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.00  DOWNSTREAM(FEET) =    665.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1720.80   CHANNEL SLOPE =  0.1191
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1143 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    103.10
  FLOW VELOCITY(FEET/SEC) =   8.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.23   Tc(MIN.) =  16.88
  LONGEST FLOWPATH FROM NODE   3006.00 TO NODE     30.00 =  4288.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3001.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.208
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3990
  SUBAREA AREA(ACRES) =   54.15   SUBAREA RUNOFF(CFS) =   91.14
  TOTAL AREA(ACRES) =    107.83   TOTAL RUNOFF(CFS) =  181.02
  TC(MIN.) =  16.88
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    107.83  TC(MIN.) =     16.88
  PEAK FLOW RATE(CFS)   =    181.02
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

FUSCOE
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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR31

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3103	3102	2	1,335.0	1,300.0	82.0	0.35	0.47	
3102	3101	5	1,300.0	1,035.0	594.0			
3102	3101	8				0.46	5.56	
3101	31	5	1,035.0	650.0	1,825.0			
3101	31	8				0.46	31.91	
							37.94	Total Area

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 31                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR31.DAT
  TIME/DATE OF STUDY: 13:56 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   3103.00 TO NODE   3102.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    82.00
  UPSTREAM ELEVATION(FEET) =   1335.00
  DOWNSTREAM ELEVATION(FEET) =   1300.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.675
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.499
 SUBAREA RUNOFF(CFS) =      1.40
 TOTAL AREA(ACRES) =      0.47   TOTAL RUNOFF(CFS) =      1.40

****************************************************************************
 FLOW PROCESS FROM NODE   3102.00 TO NODE   3101.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1035.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   594.00   CHANNEL SLOPE =  0.4461
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2195 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.40
 FLOW VELOCITY(FEET/SEC) =   2.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.37   Tc(MIN.) =   9.05
 LONGEST FLOWPATH FROM NODE   3103.00 TO NODE   3101.00 =   676.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3102.00 TO NODE   3101.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.290
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4514
 SUBAREA AREA(ACRES) =    5.56   SUBAREA RUNOFF(CFS) =   16.09
 TOTAL AREA(ACRES) =      6.03   TOTAL RUNOFF(CFS) =   17.12
 TC(MIN.) =   9.05

****************************************************************************
 FLOW PROCESS FROM NODE   3101.00 TO NODE     31.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =    650.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1825.00   CHANNEL SLOPE =  0.2110
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1655 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     17.12
 FLOW VELOCITY(FEET/SEC) =   5.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.19   Tc(MIN.) =  14.23
 LONGEST FLOWPATH FROM NODE   3103.00 TO NODE     31.00 =  2501.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3101.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.696
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4586
 SUBAREA AREA(ACRES) =   31.91   SUBAREA RUNOFF(CFS) =   68.93
 TOTAL AREA(ACRES) =     37.94   TOTAL RUNOFF(CFS) =   81.71
 TC(MIN.) =  14.23
============================================================================
 END OF STUDY SUMMARY:
```

```
  TOTAL AREA(ACRES)     =     37.94  TC(MIN.) =     14.23
  PEAK FLOW RATE(CFS)   =     81.71
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Existing Condition

BASIN E

FUSCOE ENGINEERING
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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR32

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3215	3214	2	1,450.0	1,445.0	75.0	0.35	0.25	
3214	3213	5	1,445.0	1,415.0	300.0			
3214	3213	8				0.35	15.25	
3213	3212	5	1,415.0	1,360.0	600.0			
3213	3212	8				0.35	12.04	
3212	3209	5	1,343.0	1,237.0	606.5			
3212	3209	8				0.35	11.05	
3209	3209	1						1 of 2
3211	3210	2	1,612.0	1,580.0	136.8	0.35	0.2	
3210	3209	5	1,580.0	1,237.0	1,282.0			
3210	3209	8				0.35	9.72	
3209	3209	1						2 of 2
3209	3208	5	1,237.0	1,020.0	807.7			
3209	3208	8				0.35	12.33	
3208	3204	5	1,020.0	931.0	1,048.9			
3208	3204	8				0.46	13.59	
3204	3204	1						1 of 2
3207	3206	2	1,347.0	1,335.0	93.0	0.35	0.29	
3206	3205	5	1,335.0	1,063.0	1,106.8			
3206	3205	8				0.35	15.11	
3205	3204	5	1,063.0	831.0	830.9			
3205	3204	8				0.46	12.79	
3204	3204	1						2 of 2
3204	3203	5	831.0	759.0	426.8			
3204	3203	8				0.46	5.34	
3203	32	5	759.0	724.0	430.0			
3203	32	8				0.46	14.09	
32	32	1						1 of 2
3202	3201	2	993.0	968.0	113.0	0.46	0.27	
3201	32	5	968.0	724.0	1,301.8			
3201	32	8				0.46	13.92	
32	32	1						2 of 2
							136.24	Total Area

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
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              Ver. 19.0 Release Date: 06/01/2012  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                                6390 Greenwich Dr.
                                    Suite 170
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* NEWLAND SIERRA - EXISTING HYDROLOGY                                    *
* SUBBASIN # 32                                                          *
* JANUARY 2015                                                           *
 **************************************************************************

  FILE NAME: MERR32.DAT
  TIME/DATE OF STUDY: 16:27 01/14/2015
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   3215.00 TO NODE   3214.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1450.00
  DOWNSTREAM ELEVATION(FEET) =   1445.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.212
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.017
```

```
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.70

****************************************************************************
  FLOW PROCESS FROM NODE   3214.00 TO NODE   3213.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1445.00  DOWNSTREAM(FEET) =   1415.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.70
  FLOW VELOCITY(FEET/SEC) =   1.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =    9.04
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3213.00 =     375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3214.00 TO NODE   3213.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.296
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   15.25   SUBAREA RUNOFF(CFS) =   33.60
  TOTAL AREA(ACRES) =       15.5   TOTAL RUNOFF(CFS) =      34.15
  TC(MIN.) =    9.04

****************************************************************************
  FLOW PROCESS FROM NODE   3213.00 TO NODE   3212.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1415.00  DOWNSTREAM(FEET) =   1360.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0917
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0917 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      34.15
  FLOW VELOCITY(FEET/SEC) =   5.49 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   10.86
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3212.00 =     975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3213.00 TO NODE   3212.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.593
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   12.04   SUBAREA RUNOFF(CFS) =   23.57
  TOTAL AREA(ACRES) =       27.5   TOTAL RUNOFF(CFS) =      53.91
  TC(MIN.) =   10.86

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   3212.00 TO NODE   3209.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1343.00  DOWNSTREAM(FEET) =   1237.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   606.50   CHANNEL SLOPE =  0.1748
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1474 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      53.91
 FLOW VELOCITY(FEET/SEC) =   8.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =   12.10
 LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3209.00 =    1581.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3212.00 TO NODE   3209.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.214
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =   11.05   SUBAREA RUNOFF(CFS) =   20.17
 TOTAL AREA(ACRES) =       38.6   TOTAL RUNOFF(CFS) =      70.43
 TC(MIN.) =   12.10

****************************************************************************
 FLOW PROCESS FROM NODE   3209.00 TO NODE   3209.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.10
 RAINFALL INTENSITY(INCH/HR) =   5.21
 TOTAL STREAM AREA(ACRES) =    38.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     70.43

****************************************************************************
 FLOW PROCESS FROM NODE   3211.00 TO NODE   3210.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   136.80
 UPSTREAM ELEVATION(FEET) =   1612.00
 DOWNSTREAM ELEVATION(FEET) =   1580.00
 ELEVATION DIFFERENCE(FEET) =     32.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.56
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
 FLOW PROCESS FROM NODE   3210.00 TO NODE   3209.00 IS CODE =  53
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1580.00  DOWNSTREAM(FEET) =   1237.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.00   CHANNEL SLOPE =  0.2676
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1859 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.56
  FLOW VELOCITY(FEET/SEC) =   2.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.85   Tc(MIN.) =   15.12
  LONGEST FLOWPATH FROM NODE   3211.00 TO NODE   3209.00 =    1418.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3210.00 TO NODE   3209.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.517
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    9.72   SUBAREA RUNOFF(CFS) =   15.37
  TOTAL AREA(ACRES) =        9.9   TOTAL RUNOFF(CFS) =      15.68
  TC(MIN.) =   15.12

****************************************************************************
  FLOW PROCESS FROM NODE   3209.00 TO NODE   3209.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.12
  RAINFALL INTENSITY(INCH/HR) =   4.52
  TOTAL STREAM AREA(ACRES) =     9.92
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.68

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       70.43    12.10        5.214         38.59
      2       15.68    15.12        4.517          9.92

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       82.98    12.10       5.214
      2       76.70    15.12       4.517

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      82.98   Tc(MIN.) =   12.10
  TOTAL AREA(ACRES) =       48.5
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3209.00 =    1581.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3209.00 TO NODE   2508.00 IS CODE =  53
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1237.00  DOWNSTREAM(FEET) =   1020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   807.70   CHANNEL SLOPE =  0.2687
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1862 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      82.98
  FLOW VELOCITY(FEET/SEC) =  10.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =   13.38
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   2508.00 =    2389.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3209.00 TO NODE   3208.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.887
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   12.33   SUBAREA RUNOFF(CFS) =   21.09
  TOTAL AREA(ACRES) =       60.8   TOTAL RUNOFF(CFS) =     104.07
  TC(MIN.) =   13.38

****************************************************************************
  FLOW PROCESS FROM NODE   3208.00 TO NODE   3204.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1020.00  DOWNSTREAM(FEET) =    831.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1048.90   CHANNEL SLOPE =  0.1802
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1501 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     104.07
  FLOW VELOCITY(FEET/SEC) =  10.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.72   Tc(MIN.) =   15.10
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3204.00 =    3438.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3208.00 TO NODE   3204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.521
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3701
  SUBAREA AREA(ACRES) =   13.59   SUBAREA RUNOFF(CFS) =   28.26
  TOTAL AREA(ACRES) =       74.4   TOTAL RUNOFF(CFS) =     124.54
  TC(MIN.) =   15.10

****************************************************************************
  FLOW PROCESS FROM NODE   3204.00 TO NODE   3204.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   15.10
  RAINFALL INTENSITY(INCH/HR) =   4.52
  TOTAL STREAM AREA(ACRES) =    74.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    124.54

****************************************************************************
  FLOW PROCESS FROM NODE   3207.00 TO NODE   3206.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    93.00
  UPSTREAM ELEVATION(FEET) =   1347.00
  DOWNSTREAM ELEVATION(FEET) =   1335.00
  ELEVATION DIFFERENCE(FEET) =     12.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.043
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.161
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   3206.00 TO NODE   3205.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1335.00  DOWNSTREAM(FEET) =   1063.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1106.80   CHANNEL SLOPE =  0.2458
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1786 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.83
  FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.79   Tc(MIN.) =   13.84
  LONGEST FLOWPATH FROM NODE   3207.00 TO NODE   3205.00 =    1199.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3206.00 TO NODE   3205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.782
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   15.11   SUBAREA RUNOFF(CFS) =   25.29
  TOTAL AREA(ACRES) =       15.4   TOTAL RUNOFF(CFS) =      25.78
  TC(MIN.) =   13.84

****************************************************************************
  FLOW PROCESS FROM NODE   3205.00 TO NODE   3204.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1063.00  DOWNSTREAM(FEET) =    831.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.90   CHANNEL SLOPE =  0.2792
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1897 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =      25.78
  FLOW VELOCITY(FEET/SEC) =   7.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.92   Tc(MIN.) =   15.76
  LONGEST FLOWPATH FROM NODE   3207.00 TO NODE   3204.00 =    2030.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3205.00 TO NODE   3204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.397
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3999
  SUBAREA AREA(ACRES) =   12.79   SUBAREA RUNOFF(CFS) =   25.87
  TOTAL AREA(ACRES) =       28.2   TOTAL RUNOFF(CFS) =      49.57
  TC(MIN.) =   15.76

****************************************************************************
  FLOW PROCESS FROM NODE   3204.00 TO NODE   3204.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.76
  RAINFALL INTENSITY(INCH/HR) =   4.40
  TOTAL STREAM AREA(ACRES) =    28.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     49.57

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      124.54    15.10        4.521         74.43
      2       49.57    15.76        4.397         28.19

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      172.02    15.10       4.521
      2      170.70    15.76       4.397

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     172.02   Tc(MIN.) =   15.10
  TOTAL AREA(ACRES) =      102.6
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3204.00 =    3438.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3204.00 TO NODE   3203.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    831.00  DOWNSTREAM(FEET) =    759.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   426.80   CHANNEL SLOPE =  0.1687
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1443 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     172.02
```

```
  FLOW VELOCITY(FEET/SEC) =  11.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.60   Tc(MIN.) =   15.70
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE   3203.00 =    3864.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3204.00 TO NODE   3203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.409
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3823
  SUBAREA AREA(ACRES) =    5.34   SUBAREA RUNOFF(CFS) =   10.83
  TOTAL AREA(ACRES) =      108.0   TOTAL RUNOFF(CFS) =     181.97
  TC(MIN.) =   15.70

****************************************************************************
  FLOW PROCESS FROM NODE   3203.00 TO NODE     32.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    759.00  DOWNSTREAM(FEET) =    724.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.0814
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0814 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     181.97
  FLOW VELOCITY(FEET/SEC) =   9.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =   16.49
  LONGEST FLOWPATH FROM NODE   3215.00 TO NODE     32.00 =    4294.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3203.00 TO NODE     32.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.271
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3913
  SUBAREA AREA(ACRES) =   14.09   SUBAREA RUNOFF(CFS) =   27.68
  TOTAL AREA(ACRES) =      122.1   TOTAL RUNOFF(CFS) =     203.95
  TC(MIN.) =   16.49

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     32.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.49
  RAINFALL INTENSITY(INCH/HR) =   4.27
  TOTAL STREAM AREA(ACRES) =   122.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    203.95

****************************************************************************
  FLOW PROCESS FROM NODE   3202.00 TO NODE   3201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   113.00
  UPSTREAM ELEVATION(FEET) =    993.00
  DOWNSTREAM ELEVATION(FEET) =    968.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      1.10

**************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE     32.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    968.00  DOWNSTREAM(FEET) =    724.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.84   CHANNEL SLOPE =  0.1874
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1537 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.10
  FLOW VELOCITY(FEET/SEC) =   2.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   9.58   Tc(MIN.) =   14.93
  LONGEST FLOWPATH FROM NODE   3202.00 TO NODE     32.00 =    1414.84 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE     32.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.554
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
  SUBAREA AREA(ACRES) =   13.92   SUBAREA RUNOFF(CFS) =   29.16
  TOTAL AREA(ACRES) =       14.2   TOTAL RUNOFF(CFS) =      29.72
  TC(MIN.) =   14.93

**************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     32.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.93
  RAINFALL INTENSITY(INCH/HR) =   4.55
  TOTAL STREAM AREA(ACRES) =    14.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      203.95    16.49        4.271        122.05
```

2	29.72	14.93	4.554	14.19

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	221.01	14.93	4.554
2	231.83	16.49	4.271

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 231.83 Tc(MIN.) = 16.49
TOTAL AREA(ACRES) = 136.2
LONGEST FLOWPATH FROM NODE 3215.00 TO NODE 32.00 = 4294.90 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 136.2 TC(MIN.) = 16.49
PEAK FLOW RATE(CFS) = 231.83

==========
==========

END OF RATIONAL METHOD ANALYSIS

♀

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR33

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3302	3301.8	2	1,155.0	1,065.0	75.0	0.35	0.54	
3301.8	3301.6	5	1,065.0	945.0	375.0			
3301.8	3301.6	8				0.35	2.73	
3301.6	3301	5	945.0	810.0	415.0			
3301.6	3301	8				0.46	5.97	
3301	33	5	810.0	725.0	925.0			
3301	33	8				0.46	26.36	
							35.6	Total Area


```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN # 33                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR33.DAT
  TIME/DATE OF STUDY: 14:00 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   3302.00 TO NODE   3301.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1155.00
  DOWNSTREAM ELEVATION(FEET) =   1065.00
  ELEVATION DIFFERENCE(FEET) =     90.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      1.65
 TOTAL AREA(ACRES) =      0.54   TOTAL RUNOFF(CFS) =      1.65

****************************************************************************
 FLOW PROCESS FROM NODE   3301.80 TO NODE   3301.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =    945.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   375.00   CHANNEL SLOPE =  0.3200
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.65
 FLOW VELOCITY(FEET/SEC) =   2.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =   7.54
 LONGEST FLOWPATH FROM NODE   3302.00 TO NODE   3301.60 =   450.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3301.80 TO NODE   3301.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.076
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    2.73   SUBAREA RUNOFF(CFS) =    6.76
 TOTAL AREA(ACRES) =      3.27   TOTAL RUNOFF(CFS) =    8.10
 TC(MIN.) =   7.54

****************************************************************************
 FLOW PROCESS FROM NODE   3301.60 TO NODE   3301.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    945.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   415.00   CHANNEL SLOPE =  0.3253
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2009 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.10
 FLOW VELOCITY(FEET/SEC) =   5.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =   8.91
 LONGEST FLOWPATH FROM NODE   3302.00 TO NODE   3301.00 =   865.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3301.60 TO NODE   3301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.352
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4211
 SUBAREA AREA(ACRES) =    5.97   SUBAREA RUNOFF(CFS) =   17.44
 TOTAL AREA(ACRES) =      9.24   TOTAL RUNOFF(CFS) =   24.72
 TC(MIN.) =   8.91

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   3301.00 TO NODE     33.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    810.00  DOWNSTREAM(FEET) =    725.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.00   CHANNEL SLOPE =  0.0919
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0919 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     24.72
  FLOW VELOCITY(FEET/SEC) =   4.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =  12.03
  LONGEST FLOWPATH FROM NODE   3302.00 TO NODE     33.00 =  1790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3301.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.234
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4499
  SUBAREA AREA(ACRES) =   26.36   SUBAREA RUNOFF(CFS) =   63.46
  TOTAL AREA(ACRES) =     35.60   TOTAL RUNOFF(CFS) =   83.83
  TC(MIN.) =  12.03
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     35.60  TC(MIN.) =     12.03
  PEAK FLOW RATE(CFS)   =     83.83
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR34

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3403	3402.8	2	1,575.0	1,520.0	75.0	0.35	0.29	
3402.8	3402.6	5	1,520.0	1,440.0	250.0			
3402.8	3402.6	8				0.35	1.3	
3402.6	3402	5	1,440.0	1,330.0	655.0			
3402.6	3402	8				0.35	14.27	
3402	3401	5	1,330.0	890.0	1,965.0			
3402	3401	8				0.35	71.31	
3401	34	5	890.0	805.0	525.0			
3401	34	8				0.46	10.38	
							97.55	Total Area

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN # 34                                                          *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MERR34.DAT
  TIME/DATE OF STUDY: 14:01 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   3403.00 TO NODE   3402.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1575.00
  DOWNSTREAM ELEVATION(FEET) =   1520.00
  ELEVATION DIFFERENCE(FEET) =     55.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.89
 TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
 FLOW PROCESS FROM NODE   3402.80 TO NODE   3402.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1520.00  DOWNSTREAM(FEET) =   1440.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.3200
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.89
 FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =   7.09
 LONGEST FLOWPATH FROM NODE   3403.00 TO NODE   3402.60 =   325.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3402.80 TO NODE   3402.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.361
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    1.30   SUBAREA RUNOFF(CFS) =    3.35
 TOTAL AREA(ACRES) =      1.59   TOTAL RUNOFF(CFS) =    4.10
 TC(MIN.) =   7.09

****************************************************************************
 FLOW PROCESS FROM NODE   3402.60 TO NODE   3402.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1330.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   655.00   CHANNEL SLOPE =  0.1679
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1440 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      4.10
 FLOW VELOCITY(FEET/SEC) =   3.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.21   Tc(MIN.) =  10.30
 LONGEST FLOWPATH FROM NODE   3403.00 TO NODE   3402.00 =   980.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3402.60 TO NODE   3402.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.785
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =   14.27   SUBAREA RUNOFF(CFS) =   28.89
 TOTAL AREA(ACRES) =     15.86   TOTAL RUNOFF(CFS) =   32.11
 TC(MIN.) =  10.30
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   3402.00 TO NODE   3401.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1330.00  DOWNSTREAM(FEET) =    890.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1965.00   CHANNEL SLOPE =  0.2239
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1713 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     32.11
  FLOW VELOCITY(FEET/SEC) =   7.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.45   Tc(MIN.) =  14.75
  LONGEST FLOWPATH FROM NODE   3403.00 TO NODE   3401.00 =  2945.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   3402.00 TO NODE   3401.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.589
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   71.31   SUBAREA RUNOFF(CFS) =  114.53
  TOTAL AREA(ACRES) =     87.17   TOTAL RUNOFF(CFS) =  140.00
  TC(MIN.) =  14.75

**************************************************************************
  FLOW PROCESS FROM NODE   3401.00 TO NODE     34.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    805.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.1619
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1410 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    140.00
  FLOW VELOCITY(FEET/SEC) =  10.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =  15.56
  LONGEST FLOWPATH FROM NODE   3403.00 TO NODE     34.00 =  3470.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   3401.00 TO NODE     34.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.435
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3617
  SUBAREA AREA(ACRES) =   10.38   SUBAREA RUNOFF(CFS) =   21.17
  TOTAL AREA(ACRES) =     97.55   TOTAL RUNOFF(CFS) =  156.47
  TC(MIN.) =  15.56
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     97.55  TC(MIN.) =     15.56
  PEAK FLOW RATE(CFS)   =    156.47
==========================================================================
==========================================================================
```

END OF RATIONAL METHOD ANALYSIS

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR35-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3502	3501.8	2	1,150.0	1,085.0	75.0	0.35	0.43	
3501.8	3501.6	5	1,085.0	1,035.0	300.0			
3501.8	3501.6	8				0.35	2.65	
3501.6	3501	5	1,035.0	905.0	540.0			
3501.6	3501	8				0.46	6.62	
3501	35	5	905.0	810.0	1,300.0			
3501	35	8				0.44	37.33	
							47.03	Total Area

```
**************************************************************************

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                          Analysis prepared by:

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                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 35                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR35-P.DAT
  TIME/DATE OF STUDY: 11:46 10/06/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-   CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ==================  ======  ===== ======= ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   3502.00 TO NODE   3501.80 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1150.00
  DOWNSTREAM ELEVATION(FEET) =   1085.00
  ELEVATION DIFFERENCE(FEET) =     65.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      1.32
 TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      1.32

****************************************************************************
 FLOW PROCESS FROM NODE   3501.80 TO NODE   3501.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1085.00  DOWNSTREAM(FEET) =   1035.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1667
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1433 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.32
 FLOW VELOCITY(FEET/SEC) =   2.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =   7.58
 LONGEST FLOWPATH FROM NODE   3502.00 TO NODE   3501.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3501.80 TO NODE   3501.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.052
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     2.65   SUBAREA RUNOFF(CFS) =    6.54
 TOTAL AREA(ACRES) =       3.08   TOTAL RUNOFF(CFS) =    7.60
 TC(MIN.) =   7.58

****************************************************************************
 FLOW PROCESS FROM NODE   3501.60 TO NODE   3501.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =    905.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.2407
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1769 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.60
 FLOW VELOCITY(FEET/SEC) =   4.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =   9.52
 LONGEST FLOWPATH FROM NODE   3502.00 TO NODE   3501.00 =   915.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3501.60 TO NODE   3501.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.086
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4251
 SUBAREA AREA(ACRES) =     6.62   SUBAREA RUNOFF(CFS) =   18.53
 TOTAL AREA(ACRES) =       9.70   TOTAL RUNOFF(CFS) =   25.09
 TC(MIN.) =   9.52

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    3501.00 TO NODE      35.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     905.00  DOWNSTREAM(FEET) =     810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1300.00   CHANNEL SLOPE =  0.0731
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0731 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      25.09
 FLOW VELOCITY(FEET/SEC) =   4.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.89   Tc(MIN.) =  14.42
 LONGEST FLOWPATH FROM NODE   3502.00 TO NODE      35.00 =  2215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    3501.00 TO NODE      35.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.657
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4369
 SUBAREA AREA(ACRES) =   37.33   SUBAREA RUNOFF(CFS) =   76.50
 TOTAL AREA(ACRES) =     47.03   TOTAL RUNOFF(CFS) =   95.70
 TC(MIN.) =  14.42
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     47.03  TC(MIN.) =     14.42
 PEAK FLOW RATE(CFS)    =     95.70
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Proposed Condition

BASIN A

THE FOLLOWING SUBBASINS OF MAJOR BASIN A
HAVE NO GRADING, THUS THERE IS NO CHANGE IN HYDROLOGY FOR
THE PROPOSED CONDITION.

1
2
3
4
5
6
7
8
9
12
14
14.1
15.1
17
18

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Job Name: Newland Sierra

Date: 1/20/16

Job #:

Run Name:
P-1000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1010	1009	2	1480	1470	100	0.35	0.61				
1009	1008	5	1470	1455	300	0.35	2.18				
1008	1007	5	1455	1320	630	0.35	8.11				
1007	1006	5	1320	1160	695	0.35	20.56				
1006	1006	1						1 of 2			
1014	1013	2	1620	1590	75	0.35	0.07				
1013	1012	5	1590	1515	270	0.35	0.72				
1012	1011	5	1515	1450	565	0.35	3.73				
1011	1006	5	1450	1160	1530	0.35	46.29				
1006	1006	1						2 of 2			
1006	1005	5	1160	945	1180	0.35	40.13				
1005	1005	10						Save to Bank 1			
1027	1026	2	1680	1640	100	0.35	0.10				
1026	1025	5	1640	1495	460	0.35	1.59				
1025	1024	3	1495	1485	100						
1024	1024	10						Save to Bank 2			
1035	1034	2	1531.8	1531.2	60	0.9	0.07				
1034	1033	6	1531.2	1511	455	0.9	0.60	2 sides			
1033	1031	3	1510	1500	515						
1031	1031	1						1 of 2			
1033	1032	2	1510	1508	65	0.9	0.10				
1032	1031	6	1508	1500	460	0.9	0.45	2 sides			
1031	1031	1						2 of 2			
1031	1029	3	1500	1485	430						
1029	1029	1						1 of 2			
1031	1030	2	1500	1498	65	0.9	0.06				
1030	1029	6	1498	1485	365	0.9	0.35	2 sides			
1029	1029	1						2 of 2			
1029	1024	3	1485	1480	60						
1024	1024	11						Add Bank 2			
1024	1024	12						Clear Bank 2			
1024	1021	3	1480	1475	50						
1021	1021	1						1 of 2			
1023	1022	2	1485	1484	65	0.9	0.32				

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Job Name: Newland Sierra

Date: 7/9/14

Job #:

Run Name:
P-1000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1022	1021	3	1479	1475	60						
1021	1021	1						2 of 2			
1021	1020	5	1475	1440	300	0.35	4.30				
1020	1019	5	1440	1430	140	0.35	1.40				
1019	1019	1						1 of 2			
1039	1038	2	1690	1665	80	0.35	0.34				
1038	1037	5	1665	1520	285	0.35	2.57				
1037	1036	3	1514	1490	85						
1036	1019	5	1490	1430	335	0.35	1.38				
1019	1019	1						2 of 2			
1019	1018	5	1430	1420	100	0.35	0.37				
1018	1018	10						Save to bank 2			
1044	1043	2	1733	1720	100	0.35	0.28				
1043	1042	5	1720	1510	520	0.35	3.01				
1042	1041	3	1504	1500	50						
1041	1040	5	1500	1450	160	0.35	0.31				
1040	1040	1						1 of 2			
1048	1047	2	1715	1675	100	0.35	0.20				
1047	1046	5	1675	1515	465	0.35	2.26				
1046	1045	3	1509	1500	65						
1045	1040	5	1500	1450	195	0.35	0.40				
1040	1040	1						2 of 2			
1040	1018	5	1450	1420	195	0.35	0.46				
1018	1018	11						Add bank 2			
1018	1018	12						Clear bank 2			
1018	1017	5	1420	1355	370	0.35	4.79				
1017	1016	5	1355	1340	195	0.35	2.10				
1016	1016	1						1 of 2			
1052	1051	2	1615	1605	100	0.35	0.17				
1051	1050	5	1605	1535	250	0.35	1.32				
1050	1049	3	1524	1475	130						
1049	1016	5	1475	1340	395	0.35	3.17				
1016	1016	1						2 of 2			
1016	1015	5	1340	1080	1015	0.35	12.60				
1015	1015	10						Save to bank 2			

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Job Name: Newland Sierra

Date: 7/9/14

Job #:

Run Name:
P-1000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1058	1057	2	1735	1712	100	0.35	0.29				
1057	1056	5	1712	1585	435	0.35	2.26				
1056	1055	3	1579	1560	110						
1055	1054	5	1560	1510	190	0.35	2.45				
1054	1054	1						1 of 2			
1061	1060	2	1750	1730	80	0.35	0.11				
1060	1059.4	5	1730	1545	600	0.35	4.11				
1059.4	1059.2	3	1539	1535	45						
1059.2	1054	5	1535	1510	130			brow ditch			
1054	1054	1						2 of 2			
1054	1053.2	3	1504	1485	100						
1053.2	1053	5	1485	1448	175			valley flow			
1053	1053	10						Save to bank 3			
1128	1126	2	1530	1526	70	0.9	0.07				
1126	1063	6	1526	1465	720	0.9	1.18	2 sides			
1063	1062	3	1464	1458	185						
1062	1062	1						1 of 2			
1062.4	1062.2	2	1495	1490	100	0.52	0.17				
1062.2	1062	5	1490	1458	400	0.52	2.20				
1062	1062	1						2 of 2			
1062	1053	3	1452	1448	280						
1053	1053	11						Add Bank 3			
1053	1053	12						Clear Bank 3			
1053	1015	5	1448	1080	1280	0.35	14.13				
1015	1015	10						Save to Bank 3			
1070	1069	2	1605	1585	85	0.35	0.13				
1069	1068	5	1585	1525	405	0.35	1.37				
1068	1066	3	1519	1470	710						
1066	1064	5	1470	1410	380	0.35	1.49				
1064	1064	1						1 of 2			
1065.4	1065.2	2	1495	1493	75	0.52	0.15				
1065.2	1065	5	1493	1438	780	0.52	4.38				
1065	1064	3	1438	1410	120						
1064	1064	1						2 of 2			
1065	1064	3	1432	1410	120						
1064	1015	5	1410	1080	940	0.35	5.38				

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Job #:

Run Name:
P-1000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1015	1015	11						Add bank 2			
1015	1015	11						Add bank 3			
1015	1015	12						Clear bank 2			
1015	1015	12						Clear bank 3			
1015	1005	5	1080	950	830			valley flow			
1005	1005	11						Add bank 1			
1005	1005	12						Clear bank 1			
1005	1004	5	950	890	345	0.3	5.20				
1004	1004	1						1 of 2			
1144	1142	2	1435	1380	80	0.35	0.34				
1142	1004	5	1380	890	1510	0.32	23.01				
1004	1004	1						2 of 2			
1004	1003	5	890	715	1700	0.3	62.54				
1003	1002	5	715	685	530	0.25	5.54				
1002	1002	10						Save to bank 1			
1074.8	1074.6	2	1495	1493	80	0.52	0.15				
1074.6	1074.4	6	1493	1478	595	0.52	2.89	one side			
1074.4	1074.2	3	1474.8	1474	80						
1074.2	1074	3	1474	1443	350						
1074	1074	1						1 of 2			
1079	1078	2	1465	1463.5	75	0.52	0.13				
1078	1074	5	1463.5	1443	250	0.52	3.12				
1074	1074	1						2 of 2			
1074	1073	3	1443	1430	65						
1073	1072	5	1430	1095	860	0.32	6.89				
1072	1072	1						1 of 2			
1081	1080	2	1445	1400	100	0.35	0.56				
1080	1072	5	1400	1095	915	0.33	6.95				
1072	1072	1						2 of 2			
1072	1071	5	1095	980	525	0.25	8.44				
1071	1071	10						Save to bank 2			
1106	1105	2	1494	1490	85	0.52	0.33				
1105	1099	6	1490	1463	580	0.52	3.43	2 sides			
1099	1095	3	1457	1450.9	340						

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Job #:

Run Name:
P-1000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1095	1095	1						1 of 2			
1098	1097	2	1493	1491	80	0.52	0.56				
1097	1096	6	1490	1456.8	745	0.52	5.27	two sides			
1096	1095	3	1450.9	1450.5	40						
1095	1095	1						2 of 2			
1095	1094	3	1450.5	1448	100						
1094	1094	1						1 of 2			
1108	1107	2	1477	1475	65	0.52	0.09				
1107	1094	6	1475	1455	750	0.52	1.33	one side			
1094	1094	1						2 of 2			
1094	1093	5	1448	1447.5	50	0.35	0.57				
1093	1089	3	1441.5	1412	295						
1089	1089	1						1 of 2			
1091	1090	2	1466	1460	100	0.52	0.14				
1090	1089	5	1460	1418	540	0.52	5.57				
1089	1089	1						2 of 2			
1089	1088	3	1412	1410	75						
1088	1087	5	1410	1295	365	0.35	1.81				
1087	1085	3	1289	1282	235						
1085	1085	1						1 of 2			
1111	1110	2	1435	1395	100	0.35	0.42				
1110	1109	5	1395	1290	320	0.33	1.94				
1109	1085	3	1284	1282	230						
1085	1085	1						2 of 2			
1085	1084	3	1282	1279	495						
1084	1083	3	1279	1095	340						
1083	1082	5	1095	1005	735	0.25	10.02				
1082	1082	10						Save to bank 3			
1115	1114	2	1281	1280	65	0.51	0.15				
1114	1113	6	1280	1278	130	0.51	0.75	1 side			
1113	1112.2	3	1272	1269	395						
1112.2	1112.2	1						1 of 2			
1112.6	1112.4	2	1278	1277	65	0.51	0.12				
1112.4	1112.2	6	1277	1275	260	0.51	2.82	one side			
1112.2	1112.2	1						2 of 2			

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Date: 7/9/14

Job #:

Run Name:
P-1000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1112.2	1112	3	1274	1245	175						
1112	1082	5	1245	1005	805	0.29	7.43				
1082	1082	11						Add bank 3			
1082	1082	12						Clear bank 3			
1082	1071	5	1005	980	155	0.25	0.59				
1071	1071	11						Add bank 2			
1071	1071	12						Clear bank 2			
1071	1002	5	980	700	2100	0.26	32.48				
1002	1002	1						1 of 2			
1117	1116	2	1365	1325	100	0.35	0.21				
1116	1002	5	1325	700	2240	0.27	21.97				
1002	1002	1						2 of 2			
1002	1002	11						Add bank 1			
1002	1001	5	700	675	955	0.27	43.22				
1001	10	4	675	550	755			EX 42" CSP CALTRANS S			
							474.32				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwhich Drive
                                     Suite 170
                              San Diego, California 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                     *
* BASIN 10 WITH NO DETENTION                                             *
*                                                                        *
 **************************************************************************

  FILE NAME: P-10.DAT
  TIME/DATE OF STUDY: 15:00 01/11/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1010.00 TO NODE   1009.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1470.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE   1009.00 TO NODE   1008.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1455.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0500
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.146
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.32
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.16
  Tc(MIN.) =    7.42
  SUBAREA AREA(ACRES) =     2.18       SUBAREA RUNOFF(CFS) =    5.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.8         PEAK FLOW RATE(CFS) =       6.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   4.94
  LONGEST FLOWPATH FROM NODE   1010.00 TO NODE   1008.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1008.00 TO NODE   1007.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1455.00  DOWNSTREAM(FEET) =   1320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00   CHANNEL SLOPE =  0.2143
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.597
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.70
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =    8.40
  SUBAREA AREA(ACRES) =     8.11       SUBAREA RUNOFF(CFS) =   18.72
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       10.9         PEAK FLOW RATE(CFS) =      25.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) =  12.15
  LONGEST FLOWPATH FROM NODE   1010.00 TO NODE   1007.00 =    1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1007.00 TO NODE   1006.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.00  DOWNSTREAM(FEET) =   1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   695.00   CHANNEL SLOPE =  0.2302
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.235
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.10
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   0.77
  Tc(MIN.) =    9.17
  SUBAREA AREA(ACRES) =    20.56       SUBAREA RUNOFF(CFS) =   44.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       31.5         PEAK FLOW RATE(CFS) =      68.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =  16.78
  LONGEST FLOWPATH FROM NODE   1010.00 TO NODE   1006.00 =    1725.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1006.00 TO NODE   1006.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.17
  RAINFALL INTENSITY(INCH/HR) =   6.24
  TOTAL STREAM AREA(ACRES) =    31.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     68.66

****************************************************************************
  FLOW PROCESS FROM NODE   1014.00 TO NODE   1013.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1620.00
  DOWNSTREAM ELEVATION(FEET) =   1590.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
  FLOW PROCESS FROM NODE   1013.00 TO NODE   1012.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1590.00  DOWNSTREAM(FEET) =   1515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE =  0.2778
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.879
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =   0.95
```

```
  Tc(MIN.) =    6.38
  SUBAREA AREA(ACRES) =     0.72       SUBAREA RUNOFF(CFS) =    1.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       2.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   5.74
  LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1012.00 =     345.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1012.00 TO NODE   1011.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1515.00  DOWNSTREAM(FEET) =   1450.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   565.00   CHANNEL SLOPE =  0.1150
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.909
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.44
  Tc(MIN.) =    7.82
  SUBAREA AREA(ACRES) =     3.73       SUBAREA RUNOFF(CFS) =    9.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =      10.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   7.55
  LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1011.00 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1011.00 TO NODE   1006.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.00  DOWNSTREAM(FEET) =   1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1530.00   CHANNEL SLOPE =  0.1895
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.092
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.13
  AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   1.68
  Tc(MIN.) =    9.51
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =   98.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       50.8          PEAK FLOW RATE(CFS) =     108.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =  17.79
  LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1006.00 =    2440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1006.00 TO NODE   1006.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.51
  RAINFALL INTENSITY(INCH/HR) =   6.09
  TOTAL STREAM AREA(ACRES) =    50.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    108.34

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       68.66     9.17        6.235         31.46
      2      108.34     9.51        6.092         50.81

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      173.17     9.17       6.235
      2      175.42     9.51       6.092

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     175.42   Tc(MIN.) =    9.51
  TOTAL AREA(ACRES) =       82.3
  LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1006.00 =    2440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1006.00 TO NODE   1005.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =    945.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1180.00   CHANNEL SLOPE =  0.1822
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.735
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     215.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.03
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =   10.44
  SUBAREA AREA(ACRES) =    40.13       SUBAREA RUNOFF(CFS) =   80.54
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      122.4          PEAK FLOW RATE(CFS) =     245.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.74   FLOW VELOCITY(FEET/SEC.) =  21.74
  LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1005.00 =    3620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1005.00 TO NODE   1005.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1027.00 TO NODE   1026.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1680.00
  DOWNSTREAM ELEVATION(FEET) =   1640.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.28
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1026.00 TO NODE   1025.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1640.00  DOWNSTREAM(FEET) =   1495.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   460.00   CHANNEL SLOPE =  0.3152
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.109
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.29
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   1.22
  Tc(MIN.) =    7.49
  SUBAREA AREA(ACRES) =     1.59       SUBAREA RUNOFF(CFS) =    3.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.7         PEAK FLOW RATE(CFS) =       4.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   7.75
  LONGEST FLOWPATH FROM NODE   1027.00 TO NODE   1025.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1025.00 TO NODE   1024.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1495.00  DOWNSTREAM(FEET) =  1485.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.41
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.20
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    7.62
  LONGEST FLOWPATH FROM NODE   1027.00 TO NODE   1024.00 =     660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1024.00 TO NODE   1024.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1035.00 TO NODE   1034.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1531.80
  DOWNSTREAM ELEVATION(FEET) =   1531.20
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.788
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   1034.00 TO NODE   1033.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1531.20  DOWNSTREAM ELEVATION(FEET) = 1511.00
  STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   2.09   Tc(MIN.) =    4.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    4.98
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       5.56

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.51
  FLOW VELOCITY(FEET/SEC.) =  4.08   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1033.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1033.00 TO NODE   1031.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1510.00  DOWNSTREAM(FEET) =  1500.00
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.42
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.56
  PIPE TRAVEL TIME(MIN.) =   1.16    Tc(MIN.) =    6.03
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1031.00 =    1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1031.00 TO NODE   1031.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.03
  RAINFALL INTENSITY(INCH/HR) =   8.17
  TOTAL STREAM AREA(ACRES) =     0.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.56

****************************************************************************
  FLOW PROCESS FROM NODE   1033.00 TO NODE   1032.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1510.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1508.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.996
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   1032.00 TO NODE   1031.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1508.00  DOWNSTREAM ELEVATION(FEET) = 1500.00
  STREET LENGTH(FEET) =   460.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.62
  STREET FLOW TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =    5.16
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.032
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    3.66
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       4.47

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.44
  FLOW VELOCITY(FEET/SEC.) =  2.69   DEPTH*VELOCITY(FT*FT/SEC.) =   0.79
  LONGEST FLOWPATH FROM NODE   1033.00 TO NODE   1031.00 =     525.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1031.00 TO NODE   1031.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.16
 RAINFALL INTENSITY(INCH/HR) =   9.03
 TOTAL STREAM AREA(ACRES) =     0.55
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.47

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.56     6.03        8.171          0.67
     2        4.47     5.16        9.032          0.55

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        9.23     5.16       9.032
     2        9.61     6.03       8.171

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.61   Tc(MIN.) =    6.03
 TOTAL AREA(ACRES) =        1.2
 LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1031.00 =    1030.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1031.00 TO NODE   1029.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1500.00  DOWNSTREAM(FEET) =  1485.00
 FLOW LENGTH(FEET) =   430.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.61
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.61
 PIPE TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =    6.71
 LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1029.00 =    1460.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1029.00 TO NODE   1029.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.71
  RAINFALL INTENSITY(INCH/HR) =   7.63
  TOTAL STREAM AREA(ACRES) =     1.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.61

****************************************************************************
  FLOW PROCESS FROM NODE   1031.00 TO NODE   1030.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1500.00
  DOWNSTREAM ELEVATION(FEET) =   1498.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.996
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   1030.00 TO NODE   1029.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1498.00  DOWNSTREAM ELEVATION(FEET) = 1485.00
  STREET LENGTH(FEET) =   365.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.95
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.22
  HALFSTREET FLOOD WIDTH(FEET) =    4.46
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.08
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.66
 STREET FLOW TRAVEL TIME(MIN.) =   1.98   Tc(MIN.) =    3.97
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 SUBAREA AREA(ACRES) =    0.35      SUBAREA RUNOFF(CFS) =    2.90
 TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.40

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.18
 FLOW VELOCITY(FEET/SEC.) =  3.40   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
 LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1029.00 =     430.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1029.00 TO NODE   1029.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.97
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     0.41
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.40

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        9.61     6.71        7.630          1.22
     2        3.40     3.97        9.222          0.41

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       11.35     3.97       9.222
```

```
     2       12.42     6.71       7.630

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.42   Tc(MIN.) =    6.71
  TOTAL AREA(ACRES) =        1.6
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1029.00 =    1460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1029.00 TO NODE   1024.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1485.00  DOWNSTREAM(FEET) =  1480.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.68
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.42
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    6.77
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1024.00 =    1520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1024.00 TO NODE   1024.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       12.42     6.77       7.584        1.63
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1024.00 =    1520.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        4.20     7.62       7.027        1.69
  LONGEST FLOWPATH FROM NODE   1027.00 TO NODE   1024.00 =     660.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      16.16       6.77        7.584
      2      15.71       7.62        7.027

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      16.16   Tc(MIN.) =    6.77
  TOTAL AREA(ACRES) =        3.3

****************************************************************************
  FLOW PROCESS FROM NODE   1024.00 TO NODE   1024.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1024.00 TO NODE   1021.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1480.00  DOWNSTREAM(FEET) =  1475.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.94
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.16
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    6.82
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1021.00 =    1570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1021.00 TO NODE   1021.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.82
  RAINFALL INTENSITY(INCH/HR) =   7.55
  TOTAL STREAM AREA(ACRES) =     3.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.16

****************************************************************************
  FLOW PROCESS FROM NODE   1023.00 TO NODE   1022.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1485.00
  DOWNSTREAM ELEVATION(FEET) =   1484.00
```

```
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.514
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.66
  TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      2.66

****************************************************************************
  FLOW PROCESS FROM NODE   1022.00 TO NODE   1021.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1479.00  DOWNSTREAM(FEET) =  1475.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.40
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.66
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    2.62
  LONGEST FLOWPATH FROM NODE   1023.00 TO NODE   1021.00 =     125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1021.00 TO NODE   1021.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.62
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.66

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.16     6.82        7.550          3.32
      2        2.66     2.62        9.222          0.32

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
```

```
     1        8.87     2.62       9.222
     2       18.33     6.82       7.550

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.33   Tc(MIN.) =    6.82
  TOTAL AREA(ACRES) =        3.6
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1021.00 =    1570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1021.00 TO NODE   1020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1475.00  DOWNSTREAM(FEET) =   1440.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1167
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.205
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.75
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   0.51
  Tc(MIN.) =    7.33
  SUBAREA AREA(ACRES) =     4.30       SUBAREA RUNOFF(CFS) =   10.84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.485
  TOTAL AREA(ACRES) =        7.9         PEAK FLOW RATE(CFS) =      27.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =  10.17
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1020.00 =    1870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1020.00 TO NODE   1019.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1430.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   140.00   CHANNEL SLOPE =  0.0714
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.040
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.70
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   0.27
  Tc(MIN.) =    7.60
  SUBAREA AREA(ACRES) =     1.40       SUBAREA RUNOFF(CFS) =    3.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.465
  TOTAL AREA(ACRES) =        9.3         PEAK FLOW RATE(CFS) =      30.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   8.78
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1019.00 =    2010.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1019.00 TO NODE   1019.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.60
  RAINFALL INTENSITY(INCH/HR) =   7.04
  TOTAL STREAM AREA(ACRES) =     9.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.56

****************************************************************************
  FLOW PROCESS FROM NODE   1039.00 TO NODE   1038.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1690.00
  DOWNSTREAM ELEVATION(FEET) =   1665.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.605
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.567
  SUBAREA RUNOFF(CFS) =      1.02
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      1.02

****************************************************************************
  FLOW PROCESS FROM NODE   1038.00 TO NODE   1037.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1665.00  DOWNSTREAM(FEET) =   1520.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.5088
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.105
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.66
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.44
 AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   0.50
 Tc(MIN.) =    6.11
 SUBAREA AREA(ACRES) =     2.57       SUBAREA RUNOFF(CFS) =    7.29
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       8.25

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =  11.45
 LONGEST FLOWPATH FROM NODE   1039.00 TO NODE   1037.00 =     365.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1037.00 TO NODE   1036.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.00  DOWNSTREAM(FEET) =  1490.00
 FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.80
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.25
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    6.17
 LONGEST FLOWPATH FROM NODE   1039.00 TO NODE   1036.00 =     450.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1036.00 TO NODE   1019.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1490.00  DOWNSTREAM(FEET) =   1430.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.1791
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.544
 *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.55
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   0.65
  Tc(MIN.) =    6.83
  SUBAREA AREA(ACRES) =     1.38       SUBAREA RUNOFF(CFS) =    3.64
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =      11.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   9.04
  LONGEST FLOWPATH FROM NODE   1039.00 TO NODE   1019.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1019.00 TO NODE   1019.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.83
  RAINFALL INTENSITY(INCH/HR) =   7.54
  TOTAL STREAM AREA(ACRES) =     4.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       30.56     7.60        7.040          9.34
      2       11.33     6.83        7.544          4.29

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       39.85     6.83       7.544
      2       41.14     7.60       7.040

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      41.14   Tc(MIN.) =    7.60
  TOTAL AREA(ACRES) =       13.6
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1019.00 =    2010.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1019.00 TO NODE   1018.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1430.00  DOWNSTREAM(FEET) =   1420.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   100.00   CHANNEL SLOPE =  0.1000
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.949
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.81
 AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   0.15
 Tc(MIN.) =    7.75
 SUBAREA AREA(ACRES) =     0.37       SUBAREA RUNOFF(CFS) =    0.90
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.427
 TOTAL AREA(ACRES) =       14.0         PEAK FLOW RATE(CFS) =      41.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =  10.79
 LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1018.00 =    2110.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1018.00 TO NODE   1018.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1044.00 TO NODE   1043.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1733.00
 DOWNSTREAM ELEVATION(FEET) =   1720.00
 ELEVATION DIFFERENCE(FEET) =     13.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.78
 TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.78
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1043.00 TO NODE   1042.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1720.00  DOWNSTREAM(FEET) =   1510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.4038
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.232
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.48
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.02
  Tc(MIN.) =    7.29
  SUBAREA AREA(ACRES) =     3.01       SUBAREA RUNOFF(CFS) =    7.62
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        3.3         PEAK FLOW RATE(CFS) =       8.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =  10.67
  LONGEST FLOWPATH FROM NODE   1044.00 TO NODE   1042.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1042.00 TO NODE   1041.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1504.00  DOWNSTREAM(FEET) =  1500.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.33
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    7.35
  LONGEST FLOWPATH FROM NODE   1044.00 TO NODE   1041.00 =     670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1041.00 TO NODE   1040.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1450.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   160.00   CHANNEL SLOPE =  0.3125
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.030
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.00
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   0.27
  Tc(MIN.) =    7.62
  SUBAREA AREA(ACRES) =     0.31       SUBAREA RUNOFF(CFS) =    0.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        3.6         PEAK FLOW RATE(CFS) =       8.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   9.91
  LONGEST FLOWPATH FROM NODE   1044.00 TO NODE   1040.00 =     830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1040.00 TO NODE   1040.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.62
  RAINFALL INTENSITY(INCH/HR) =   7.03
  TOTAL STREAM AREA(ACRES) =     3.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.86

****************************************************************************
  FLOW PROCESS FROM NODE   1048.00 TO NODE   1047.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1715.00
  DOWNSTREAM ELEVATION(FEET) =   1675.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
```

```
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE   1047.00 TO NODE   1046.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1675.00  DOWNSTREAM(FEET) =   1515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   465.00   CHANNEL SLOPE =  0.3441
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.209
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.33
  AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   1.06
  Tc(MIN.) =    7.32
  SUBAREA AREA(ACRES) =     2.26       SUBAREA RUNOFF(CFS) =    5.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       6.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   9.07
  LONGEST FLOWPATH FROM NODE   1048.00 TO NODE   1046.00 =     565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1046.00 TO NODE   1045.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1509.00  DOWNSTREAM(FEET) =  1500.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.58
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.21
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    7.39
  LONGEST FLOWPATH FROM NODE   1048.00 TO NODE   1045.00 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1045.00 TO NODE   1040.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1450.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.2564
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.938
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.58
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   0.38
  Tc(MIN.) =    7.77
  SUBAREA AREA(ACRES) =     0.40       SUBAREA RUNOFF(CFS) =    0.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       6.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   8.57
  LONGEST FLOWPATH FROM NODE   1048.00 TO NODE   1040.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1040.00 TO NODE   1040.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.77
  RAINFALL INTENSITY(INCH/HR) =   6.94
  TOTAL STREAM AREA(ACRES) =     2.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.94

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.86     7.62        7.030          3.60
      2        6.94     7.77        6.938          2.86

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
```

```
     1       15.66     7.62       7.030
     2       15.69     7.77       6.938

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.69   Tc(MIN.) =    7.77
  TOTAL AREA(ACRES) =        6.5
  LONGEST FLOWPATH FROM NODE   1044.00 TO NODE   1040.00 =     830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1040.00 TO NODE   1018.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.00  DOWNSTREAM(FEET) =   1420.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.1538
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.738
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.00
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.36
  Tc(MIN.) =    8.13
  SUBAREA AREA(ACRES) =     0.46       SUBAREA RUNOFF(CFS) =    1.08
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        6.9         PEAK FLOW RATE(CFS) =      16.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   9.05
  LONGEST FLOWPATH FROM NODE   1044.00 TO NODE   1018.00 =    1025.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1018.00 TO NODE   1018.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       16.32     8.13       6.738        6.92
  LONGEST FLOWPATH FROM NODE   1044.00 TO NODE   1018.00 =    1025.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       41.51     7.75       6.949       14.00
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1018.00 =    2110.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      57.06       7.75        6.949
      2      56.56       8.13        6.738

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      57.06   Tc(MIN.) =    7.75
  TOTAL AREA(ACRES) =       20.9

****************************************************************************
  FLOW PROCESS FROM NODE   1018.00 TO NODE   1018.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1018.00 TO NODE   1017.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1420.00  DOWNSTREAM(FEET) =   1355.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   370.00   CHANNEL SLOPE =  0.1757
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.720
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.92
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   0.41
  Tc(MIN.) =    8.17
  SUBAREA AREA(ACRES) =     4.79       SUBAREA RUNOFF(CFS) =   11.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.392
  TOTAL AREA(ACRES) =       25.7         PEAK FLOW RATE(CFS) =      67.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =  15.19
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1017.00 =    2480.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1017.00 TO NODE   1016.00 IS CODE =  51
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1355.00  DOWNSTREAM(FEET) =   1340.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.0769
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.573
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.40
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   0.28
  Tc(MIN.) =    8.45
  SUBAREA AREA(ACRES) =     2.10       SUBAREA RUNOFF(CFS) =    4.83
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.389
  TOTAL AREA(ACRES) =       27.8         PEAK FLOW RATE(CFS) =      71.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =  11.45
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1016.00 =    2675.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1016.00 TO NODE   1016.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.45
  RAINFALL INTENSITY(INCH/HR) =   6.57
  TOTAL STREAM AREA(ACRES) =    27.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     71.03

****************************************************************************
  FLOW PROCESS FROM NODE   1052.00 TO NODE   1051.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1615.00
  DOWNSTREAM ELEVATION(FEET) =   1605.00
  ELEVATION DIFFERENCE(FEET) =     10.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE   1051.00 TO NODE   1050.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1605.00  DOWNSTREAM(FEET) =   1535.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.2800
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.432
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.79
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   0.72
  Tc(MIN.) =    6.99
  SUBAREA AREA(ACRES) =     1.32       SUBAREA RUNOFF(CFS) =    3.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.5         PEAK FLOW RATE(CFS) =       3.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE   1052.00 TO NODE   1050.00 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1050.00 TO NODE   1049.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1524.00  DOWNSTREAM(FEET) =  1475.00
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.88
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    7.10
  LONGEST FLOWPATH FROM NODE   1052.00 TO NODE   1049.00 =     480.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1049.00 TO NODE   1016.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1475.00  DOWNSTREAM(FEET) =   1340.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.00   CHANNEL SLOPE =  0.3418
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.943
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.90
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   0.66
  Tc(MIN.) =    7.76
  SUBAREA AREA(ACRES) =     3.17       SUBAREA RUNOFF(CFS) =    7.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      11.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =  11.12
  LONGEST FLOWPATH FROM NODE   1052.00 TO NODE   1016.00 =     875.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1016.00 TO NODE   1016.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.76
  RAINFALL INTENSITY(INCH/HR) =   6.94
  TOTAL STREAM AREA(ACRES) =     4.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.32

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       71.03     8.45        6.573         27.81
      2       11.32     7.76        6.943          4.66

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       76.58     7.76       6.943
      2       81.75     8.45       6.573

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      81.75   Tc(MIN.) =    8.45
  TOTAL AREA(ACRES) =       32.5
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1016.00 =    2675.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1016.00 TO NODE   1015.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1015.00   CHANNEL SLOPE =  0.2562
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.165
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      95.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.16
  AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   0.88
  Tc(MIN.) =    9.33
  SUBAREA AREA(ACRES) =    12.60       SUBAREA RUNOFF(CFS) =   27.19
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.374
  TOTAL AREA(ACRES) =       45.1         PEAK FLOW RATE(CFS) =     103.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =  19.60
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1015.00 =    3690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1058.00 TO NODE   1057.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1735.00
  DOWNSTREAM ELEVATION(FEET) =   1712.00
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.81
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.81

****************************************************************************
  FLOW PROCESS FROM NODE   1057.00 TO NODE   1056.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1712.00  DOWNSTREAM(FEET) =   1585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.00   CHANNEL SLOPE =  0.2920
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.236
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.14
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.01
  Tc(MIN.) =    7.28
  SUBAREA AREA(ACRES) =     2.26       SUBAREA RUNOFF(CFS) =    5.72
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       6.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   8.69
  LONGEST FLOWPATH FROM NODE   1058.00 TO NODE   1056.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1056.00 TO NODE   1055.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1579.00  DOWNSTREAM(FEET) =  1560.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.05
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.46
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    7.39
  LONGEST FLOWPATH FROM NODE   1058.00 TO NODE   1055.00 =     645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1055.00 TO NODE   1054.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1560.00  DOWNSTREAM(FEET) =   1510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   190.00   CHANNEL SLOPE =  0.2632
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.968
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.57
  AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   0.33
  Tc(MIN.) =    7.72
  SUBAREA AREA(ACRES) =     2.45       SUBAREA RUNOFF(CFS) =    5.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        5.0         PEAK FLOW RATE(CFS) =      12.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =  10.34
  LONGEST FLOWPATH FROM NODE   1058.00 TO NODE   1054.00 =     835.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1054.00 TO NODE   1054.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.72
  RAINFALL INTENSITY(INCH/HR) =   6.97
  TOTAL STREAM AREA(ACRES) =     5.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.19

****************************************************************************
  FLOW PROCESS FROM NODE   1061.00 TO NODE   1060.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1750.00
  DOWNSTREAM ELEVATION(FEET) =   1730.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.605
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.567
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE   1060.00 TO NODE   1059.40 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1730.00  DOWNSTREAM(FEET) =   1545.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.3083
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.575
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.49
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.18
  Tc(MIN.) =    6.78
  SUBAREA AREA(ACRES) =     4.11       SUBAREA RUNOFF(CFS) =   10.90
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.2         PEAK FLOW RATE(CFS) =      11.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =  10.66
  LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1059.40 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1059.40 TO NODE   1059.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1539.00  DOWNSTREAM(FEET) =  1535.00
```

```
 FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.63
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.19
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    6.83
 LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1059.20 =     725.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1059.20 TO NODE   1054.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1535.00  DOWNSTREAM(FEET) =   1510.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00   CHANNEL SLOPE =  0.1923
 NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      11.19
 FLOW VELOCITY(FEET/SEC) =   8.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.27   Tc(MIN.) =    7.10
 LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1054.00 =     855.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1054.00 TO NODE   1054.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.10
 RAINFALL INTENSITY(INCH/HR) =   7.36
 TOTAL STREAM AREA(ACRES) =     4.22
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.19

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       12.19     7.72        6.968          5.00
     2       11.19     7.10        7.357          4.22

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
```

```
     1       22.40     7.10       7.357
     2       22.79     7.72       6.968

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.79   Tc(MIN.) =    7.72
  TOTAL AREA(ACRES) =        9.2
  LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1054.00 =     855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1054.00 TO NODE   1053.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1504.00  DOWNSTREAM(FEET) =  1485.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.79
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    7.79
  LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1053.20 =     955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1053.20 TO NODE   1053.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1485.00  DOWNSTREAM(FEET) =   1448.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   175.00   CHANNEL SLOPE =  0.2114
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      22.79
  FLOW VELOCITY(FEET/SEC) =   9.82 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.30   Tc(MIN.) =    8.08
  LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1053.00 =    1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1053.00 TO NODE   1053.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1128.00 TO NODE   1126.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1526.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.685
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

********************************************************************************
  FLOW PROCESS FROM NODE   1126.00 TO NODE   1063.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1465.00
  STREET LENGTH(FEET) =   720.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.34
  STREET FLOW TRAVEL TIME(MIN.) =   2.26   Tc(MIN.) =    3.95
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.18      SUBAREA RUNOFF(CFS) =    9.79
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =      10.37
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.57
  FLOW VELOCITY(FEET/SEC.) =  6.08   DEPTH*VELOCITY(FT*FT/SEC.) =   1.81
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1063.00 =     790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1063.00 TO NODE   1062.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1464.00  DOWNSTREAM(FEET) =  1458.00
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.53
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.37
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    4.24
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1062.00 =     975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1062.00 TO NODE   1062.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.24
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.37

****************************************************************************
  FLOW PROCESS FROM NODE   1062.40 TO NODE   1062.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1495.00
  DOWNSTREAM ELEVATION(FEET) =   1490.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.106
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.107
```

```
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE   1062.20 TO NODE   1062.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1490.00  DOWNSTREAM(FEET) =   1458.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.0800
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.167
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.19
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.29
  Tc(MIN.) =    7.39
  SUBAREA AREA(ACRES) =     2.20       SUBAREA RUNOFF(CFS) =    8.20
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       8.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   6.25
  LONGEST FLOWPATH FROM NODE   1062.40 TO NODE   1062.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1062.00 TO NODE   1062.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.39
  RAINFALL INTENSITY(INCH/HR) =   7.17
  TOTAL STREAM AREA(ACRES) =     2.37
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.37     4.24        9.222          1.25
      2        8.83     7.39        7.167          2.37
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.44     4.24       9.222
      2       16.89     7.39       7.167

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.89   Tc(MIN.) =    7.39
  TOTAL AREA(ACRES) =        3.6
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1062.00 =     975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1062.00 TO NODE   1053.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1452.00  DOWNSTREAM(FEET) =  1448.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.49
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.89
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    7.94
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1053.00 =    1255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1053.00 TO NODE   1053.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       16.89     7.94       6.843        3.62
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1053.00 =    1255.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       22.79     8.08       6.764        9.22
  LONGEST FLOWPATH FROM NODE   1061.00 TO NODE   1053.00 =    1130.00 FEET.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      39.28       7.94        6.843
      2      39.49       8.08        6.764

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      39.49   Tc(MIN.) =    8.08
  TOTAL AREA(ACRES) =       12.8

****************************************************************************
  FLOW PROCESS FROM NODE   1053.00 TO NODE   1053.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1053.00 TO NODE   1015.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1448.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1280.00   CHANNEL SLOPE =  0.2875
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.166
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.08
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   1.25
  Tc(MIN.) =    9.33
  SUBAREA AREA(ACRES) =    14.13       SUBAREA RUNOFF(CFS) =   30.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.390
  TOTAL AREA(ACRES) =       27.0         PEAK FLOW RATE(CFS) =      64.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) =  17.93
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1015.00 =    2535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1070.00 TO NODE   1069.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
 UPSTREAM ELEVATION(FEET) =   1605.00
 DOWNSTREAM ELEVATION(FEET) =   1585.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.401
 SUBAREA RUNOFF(CFS) =      0.38
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
 FLOW PROCESS FROM NODE   1069.00 TO NODE   1068.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1585.00  DOWNSTREAM(FEET) =   1525.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   405.00   CHANNEL SLOPE =  0.1481
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.270
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.65
 AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   1.45
 Tc(MIN.) =    7.23
 SUBAREA AREA(ACRES) =     1.37       SUBAREA RUNOFF(CFS) =    3.49
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        1.5         PEAK FLOW RATE(CFS) =       3.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   5.82
 LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1068.00 =     490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1068.00 TO NODE   1066.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.00  DOWNSTREAM(FEET) =  1470.00
  FLOW LENGTH(FEET) =   710.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.56
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.82
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =    8.35
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1066.00 =    1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1066.00 TO NODE   1064.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1410.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00   CHANNEL SLOPE =  0.1579
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.182
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.70
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =    9.29
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    3.22
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        3.0         PEAK FLOW RATE(CFS) =       6.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   7.18
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1064.00 =    1580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1064.00 TO NODE   1064.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.29
  RAINFALL INTENSITY(INCH/HR) =   6.18
  TOTAL STREAM AREA(ACRES) =     2.99
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.47
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1065.40 TO NODE   1065.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1495.00
  DOWNSTREAM ELEVATION(FEET) =   1493.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.520
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.770
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
  FLOW PROCESS FROM NODE   1065.20 TO NODE   1065.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1493.00  DOWNSTREAM(FEET) =   1438.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.00   CHANNEL SLOPE =  0.0705
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.421
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.80
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   2.24
  Tc(MIN.) =    8.76
  SUBAREA AREA(ACRES) =     4.38       SUBAREA RUNOFF(CFS) =   14.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =      15.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE   1065.40 TO NODE   1065.00 =     855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1065.00 TO NODE   1064.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1438.00  DOWNSTREAM(FEET) =  1410.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.11
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.13
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.85
  LONGEST FLOWPATH FROM NODE   1065.40 TO NODE   1064.00 =     975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1064.00 TO NODE   1064.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.85
  RAINFALL INTENSITY(INCH/HR) =   6.38
  TOTAL STREAM AREA(ACRES) =     4.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.13

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.47     9.29        6.182          2.99
      2       15.13     8.85        6.383          4.53

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       21.28     8.85       6.383
      2       21.12     9.29       6.182

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.28   Tc(MIN.) =    8.85
  TOTAL AREA(ACRES) =        7.5
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1064.00 =    1580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1065.00 TO NODE   1064.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1432.00  DOWNSTREAM(FEET) =  1410.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.13
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.28
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.93
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1064.00 =    1700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1064.00 TO NODE   1015.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1410.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.00   CHANNEL SLOPE =  0.3511
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.902
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.79
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   1.06
  Tc(MIN.) =    9.99
  SUBAREA AREA(ACRES) =     5.38       SUBAREA RUNOFF(CFS) =   11.11
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.410
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =      31.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =  15.57
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1015.00 =    2640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
```

```
    1       31.19     9.99       5.902       12.90
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1015.00 =    2640.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       103.87     9.33       6.165       45.07
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1015.00 =    3690.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      133.01       9.33        6.165
    2      130.62       9.99        5.902

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     133.01   Tc(MIN.) =    9.33
  TOTAL AREA(ACRES) =       58.0

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       133.01     9.33       6.165       57.97
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1015.00 =    3690.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        64.92     9.33       6.166       26.97
  LONGEST FLOWPATH FROM NODE   1128.00 TO NODE   1015.00 =    2535.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      197.93       9.33        6.166
    2      197.93       9.33        6.165

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     197.93   Tc(MIN.) =    9.33
  TOTAL AREA(ACRES) =       84.9

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1015.00 TO NODE   1005.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00   CHANNEL SLOPE =  0.1566
 NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =     197.93
 FLOW VELOCITY(FEET/SEC) =  18.49 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.75   Tc(MIN.) =   10.08
 LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1005.00 =    4520.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1005.00 TO NODE   1005.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      197.93    10.08       5.866       84.94
 LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1005.00 =    4520.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      245.67    10.44       5.735      122.40
 LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1005.00 =    3620.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     435.11      10.08        5.866
     2     439.16      10.44        5.735
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     439.16   Tc(MIN.) =   10.44
  TOTAL AREA(ACRES) =      207.3

****************************************************************************
  FLOW PROCESS FROM NODE   1005.00 TO NODE   1005.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1005.00 TO NODE   1004.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    890.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.1739
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.654
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     443.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  24.95
  AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   0.23
  Tc(MIN.) =   10.67
  SUBAREA AREA(ACRES) =     5.20       SUBAREA RUNOFF(CFS) =    8.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.363
  TOTAL AREA(ACRES) =      212.5         PEAK FLOW RATE(CFS) =     439.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =  24.87
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1004.00 =    4865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1004.00 TO NODE   1004.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.67
  RAINFALL INTENSITY(INCH/HR) =   5.65
  TOTAL STREAM AREA(ACRES) =   212.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    439.16
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1144.00 TO NODE   1142.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1435.00
  DOWNSTREAM ELEVATION(FEET) =   1380.00
  ELEVATION DIFFERENCE(FEET) =     55.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.605
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.567
  SUBAREA RUNOFF(CFS) =      1.02
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      1.02

****************************************************************************
  FLOW PROCESS FROM NODE   1142.00 TO NODE   1004.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1380.00  DOWNSTREAM(FEET) =    890.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1510.00   CHANNEL SLOPE =  0.3245
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.199
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.51
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =    7.34
  SUBAREA AREA(ACRES) =    23.01       SUBAREA RUNOFF(CFS) =   53.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.320
  TOTAL AREA(ACRES) =       23.4         PEAK FLOW RATE(CFS) =      53.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =  17.78
  LONGEST FLOWPATH FROM NODE   1144.00 TO NODE   1004.00 =    1590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1004.00 TO NODE   1004.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.34
  RAINFALL INTENSITY(INCH/HR) =   7.20
  TOTAL STREAM AREA(ACRES) =    23.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     53.87

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      439.16    10.67        5.654        212.54
      2       53.87     7.34        7.199         23.35

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      355.86     7.34       7.199
      2      481.47    10.67       5.654

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     481.47   Tc(MIN.) =   10.67
  TOTAL AREA(ACRES) =      235.9
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1004.00 =    4865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1004.00 TO NODE   1003.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    715.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1700.00   CHANNEL SLOPE =  0.1029
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.245
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     530.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.49
  AVERAGE FLOW DEPTH(FEET) =   2.84   TRAVEL TIME(MIN.) =   1.32
  Tc(MIN.) =   11.99
```

```
  SUBAREA AREA(ACRES) =    62.54       SUBAREA RUNOFF(CFS) =   98.41
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.346
  TOTAL AREA(ACRES) =      298.4         PEAK FLOW RATE(CFS) =     541.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.87   FLOW VELOCITY(FEET/SEC.) =  21.58
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1003.00 =    6565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1002.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    715.00  DOWNSTREAM(FEET) =    685.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.0566
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.106
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     545.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.29
  AVERAGE FLOW DEPTH(FEET) =   3.29   TRAVEL TIME(MIN.) =   0.51
  Tc(MIN.) =   12.50
  SUBAREA AREA(ACRES) =     5.54       SUBAREA RUNOFF(CFS) =    7.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.344
  TOTAL AREA(ACRES) =      304.0         PEAK FLOW RATE(CFS) =     541.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.28   FLOW VELOCITY(FEET/SEC.) =  17.30
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1002.00 =    7095.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1074.80 TO NODE   1074.60 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1495.00
  DOWNSTREAM ELEVATION(FEET) =   1493.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.880
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.506
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
  FLOW PROCESS FROM NODE   1074.60 TO NODE   1074.40 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1493.00  DOWNSTREAM ELEVATION(FEET) = 1478.00
  STREET LENGTH(FEET) =   595.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.20
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.32
  STREET FLOW TRAVEL TIME(MIN.) =   2.63   Tc(MIN.) =    9.51
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.093
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    2.89      SUBAREA RUNOFF(CFS) =    9.16
  TOTAL AREA(ACRES) =        3.0        PEAK FLOW RATE(CFS) =       9.63

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.41
  FLOW VELOCITY(FEET/SEC.) =  4.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.82
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1074.40 =     675.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1074.40 TO NODE   1074.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1474.80  DOWNSTREAM(FEET) =  1474.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.43
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.63
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    9.71
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1074.20 =     755.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1074.20 TO NODE   1074.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1474.00  DOWNSTREAM(FEET) =  1443.00
  FLOW LENGTH(FEET) =   350.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.98
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.63
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   10.10
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1074.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1074.00 TO NODE   1074.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.10
  RAINFALL INTENSITY(INCH/HR) =   5.86
  TOTAL STREAM AREA(ACRES) =     3.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.63

****************************************************************************
  FLOW PROCESS FROM NODE   1079.00 TO NODE   1078.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1465.00
  DOWNSTREAM ELEVATION(FEET) =   1463.50
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.176
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.304
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE   1078.00 TO NODE   1074.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1463.50  DOWNSTREAM(FEET) =   1443.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.0820
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.854
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   0.74
  Tc(MIN.) =    7.92
  SUBAREA AREA(ACRES) =     3.12       SUBAREA RUNOFF(CFS) =   11.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  TOTAL AREA(ACRES) =        3.2         PEAK FLOW RATE(CFS) =      11.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   6.94
  LONGEST FLOWPATH FROM NODE   1079.00 TO NODE   1074.00 =     325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1074.00 TO NODE   1074.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.92
  RAINFALL INTENSITY(INCH/HR) =   6.85
```

```
  TOTAL STREAM AREA(ACRES) =     3.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.58

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.63    10.10        5.858          3.04
      2       11.58     7.92        6.854          3.25

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.13     7.92       6.854
      2       19.53    10.10       5.858

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.53   Tc(MIN.) =   10.10
  TOTAL AREA(ACRES) =        6.3
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1074.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1074.00 TO NODE   1073.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1443.00  DOWNSTREAM(FEET) =  1430.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.39
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.53
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   10.15
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1073.00 =    1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1073.00 TO NODE   1072.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1430.00  DOWNSTREAM(FEET) =   1095.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.00   CHANNEL SLOPE =  0.3895
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
```

```
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.514
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.11
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   0.95
  Tc(MIN.) =   11.10
  SUBAREA AREA(ACRES) =     6.89       SUBAREA RUNOFF(CFS) =   12.16
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.415
  TOTAL AREA(ACRES) =       13.2         PEAK FLOW RATE(CFS) =      30.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =  15.98
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1072.00 =    2030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1072.00 TO NODE   1072.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.10
  RAINFALL INTENSITY(INCH/HR) =   5.51
  TOTAL STREAM AREA(ACRES) =    13.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.19

****************************************************************************
  FLOW PROCESS FROM NODE   1081.00 TO NODE   1080.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1445.00
  DOWNSTREAM ELEVATION(FEET) =   1400.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      1.56
  TOTAL AREA(ACRES) =      0.56   TOTAL RUNOFF(CFS) =      1.56

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1080.00 TO NODE   1072.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1400.00  DOWNSTREAM(FEET) =   1095.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   915.00   CHANNEL SLOPE =  0.3333
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.959
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3300
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.60
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.38
 AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.47
 Tc(MIN.) =    7.74
 SUBAREA AREA(ACRES) =     6.95       SUBAREA RUNOFF(CFS) =   15.96
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.331
 TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =      17.33

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =  12.56
 LONGEST FLOWPATH FROM NODE   1081.00 TO NODE   1072.00 =    1015.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1072.00 TO NODE   1072.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.74
 RAINFALL INTENSITY(INCH/HR) =   6.96
 TOTAL STREAM AREA(ACRES) =     7.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.33

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       30.19    11.10        5.514         13.18
     2       17.33     7.74        6.959          7.51

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       41.25     7.74       6.959
      2       43.92    11.10       5.514

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      43.92   Tc(MIN.) =   11.10
  TOTAL AREA(ACRES) =       20.7
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1072.00 =    2030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1072.00 TO NODE   1071.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1095.00  DOWNSTREAM(FEET) =    980.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.2190
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.336
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.08
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   0.58
  Tc(MIN.) =   11.68
  SUBAREA AREA(ACRES) =     8.44       SUBAREA RUNOFF(CFS) =   11.26
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.346
  TOTAL AREA(ACRES) =       29.1         PEAK FLOW RATE(CFS) =      53.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =  15.44
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1071.00 =    2555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1071.00 TO NODE   1071.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1106.00 TO NODE   1105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1494.00
  DOWNSTREAM ELEVATION(FEET) =   1490.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.744
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.432
  SUBAREA RUNOFF(CFS) =      1.45
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.45

****************************************************************************
  FLOW PROCESS FROM NODE   1105.00 TO NODE   1099.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1490.00  DOWNSTREAM ELEVATION(FEET) = 1463.00
  STREET LENGTH(FEET) =   580.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.60
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.33
  STREET FLOW TRAVEL TIME(MIN.) =   2.17   Tc(MIN.) =    7.91
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.858
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    3.43      SUBAREA RUNOFF(CFS) =   12.23
  TOTAL AREA(ACRES) =        3.8        PEAK FLOW RATE(CFS) =      13.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  10.97
  FLOW VELOCITY(FEET/SEC.) =  5.07   DEPTH*VELOCITY(FT*FT/SEC.) =   1.75
```

```
 LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1099.00 =     665.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1099.00 TO NODE   1095.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1457.00  DOWNSTREAM(FEET) =  1450.90
 FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.96
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      13.41
 PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    8.55
 LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1095.00 =    1005.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1095.00 TO NODE   1095.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.55
 RAINFALL INTENSITY(INCH/HR) =   6.53
 TOTAL STREAM AREA(ACRES) =     3.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.41

****************************************************************************
 FLOW PROCESS FROM NODE   1098.00 TO NODE   1097.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5200
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
 UPSTREAM ELEVATION(FEET) =   1493.00
 DOWNSTREAM ELEVATION(FEET) =   1491.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.880
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.506
 SUBAREA RUNOFF(CFS) =      2.19
 TOTAL AREA(ACRES) =      0.56   TOTAL RUNOFF(CFS) =      2.19

****************************************************************************
 FLOW PROCESS FROM NODE   1097.00 TO NODE   1096.00 IS CODE =  62
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1491.00  DOWNSTREAM ELEVATION(FEET) = 1456.80
  STREET LENGTH(FEET) =   745.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.61
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =    9.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.55
  STREET FLOW TRAVEL TIME(MIN.) =   2.60   Tc(MIN.) =    9.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.103
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    5.27      SUBAREA RUNOFF(CFS) =   16.72
  TOTAL AREA(ACRES) =        5.8        PEAK FLOW RATE(CFS) =      18.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.53
  FLOW VELOCITY(FEET/SEC.) =  5.48   DEPTH*VELOCITY(FT*FT/SEC.) =   2.06
  LONGEST FLOWPATH FROM NODE   1098.00 TO NODE   1096.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1096.00 TO NODE   1095.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1450.90  DOWNSTREAM(FEET) =  1450.50
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.68
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      18.50
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.57
  LONGEST FLOWPATH FROM NODE   1098.00 TO NODE   1095.00 =     865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1095.00 TO NODE   1095.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.57
  RAINFALL INTENSITY(INCH/HR) =   6.07
  TOTAL STREAM AREA(ACRES) =     5.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.50

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.41     8.55        6.526          3.76
      2       18.50     9.57        6.067          5.83

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       29.93     8.55       6.526
      2       30.97     9.57       6.067

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.97   Tc(MIN.) =    9.57
  TOTAL AREA(ACRES) =        9.6
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1095.00 =    1005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1095.00 TO NODE   1094.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1450.50  DOWNSTREAM(FEET) =  1448.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.24
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      30.97
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    9.71
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1094.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1094.00 TO NODE   1094.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.71
  RAINFALL INTENSITY(INCH/HR) =   6.01
  TOTAL STREAM AREA(ACRES) =     9.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.97

****************************************************************************
  FLOW PROCESS FROM NODE   1108.00 TO NODE   1107.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1477.00
  DOWNSTREAM ELEVATION(FEET) =   1475.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.787
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.392
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE   1107.00 TO NODE   1094.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1475.00  DOWNSTREAM ELEVATION(FEET) = 1455.00
  STREET LENGTH(FEET) =   750.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
```

```
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   3.80   Tc(MIN.) =    9.58
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.061
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    1.33      SUBAREA RUNOFF(CFS) =    4.19
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       4.48

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.41
  FLOW VELOCITY(FEET/SEC.) =  3.73   DEPTH*VELOCITY(FT*FT/SEC.) =   1.25
  LONGEST FLOWPATH FROM NODE   1108.00 TO NODE   1094.00 =     815.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1094.00 TO NODE   1094.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.58
  RAINFALL INTENSITY(INCH/HR) =   6.06
  TOTAL STREAM AREA(ACRES) =     1.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.48

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       30.97     9.71        6.012          9.59
      2        4.48     9.58        6.061          1.42

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       35.19     9.58       6.061
      2       35.41     9.71       6.012

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      35.41   Tc(MIN.) =    9.71
  TOTAL AREA(ACRES) =       11.0
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1094.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1094.00 TO NODE   1093.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1448.00  DOWNSTREAM(FEET) =   1447.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.939
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.51
  AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   0.18
  Tc(MIN.) =    9.89
  SUBAREA AREA(ACRES) =     0.57       SUBAREA RUNOFF(CFS) =    1.18
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.512
  TOTAL AREA(ACRES) =       11.6         PEAK FLOW RATE(CFS) =      35.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =   4.50
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1093.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1093.00 TO NODE   1089.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1441.50  DOWNSTREAM(FEET) =  1412.00
  FLOW LENGTH(FEET) =   295.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.66
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.41
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   10.12
```

```
 LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1089.00 =    1450.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1089.00 TO NODE   1089.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.12
 RAINFALL INTENSITY(INCH/HR) =   5.85
 TOTAL STREAM AREA(ACRES) =    11.58
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     35.41

****************************************************************************
 FLOW PROCESS FROM NODE   1091.00 TO NODE   1090.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5200
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1466.00
 DOWNSTREAM ELEVATION(FEET) =   1460.00
 ELEVATION DIFFERENCE(FEET) =      6.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.746
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.431
 SUBAREA RUNOFF(CFS) =      0.61
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
 FLOW PROCESS FROM NODE   1090.00 TO NODE   1089.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1460.00  DOWNSTREAM(FEET) =   1418.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.0778
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.373
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5200
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
 AVERAGE FLOW DEPTH(FEET) =   0.43   TRAVEL TIME(MIN.) =   1.33
```

```
  Tc(MIN.) =    7.07
  SUBAREA AREA(ACRES) =     5.57       SUBAREA RUNOFF(CFS) =   21.36
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  TOTAL AREA(ACRES) =        5.7         PEAK FLOW RATE(CFS) =      21.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOW VELOCITY(FEET/SEC.) =   8.18
  LONGEST FLOWPATH FROM NODE   1091.00 TO NODE   1089.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1089.00 TO NODE   1089.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.07
  RAINFALL INTENSITY(INCH/HR) =   7.37
  TOTAL STREAM AREA(ACRES) =     5.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.89

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       35.41    10.12        5.853         11.58
      2       21.89     7.07        7.373          5.71

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       50.00     7.07       7.373
      2       52.78    10.12       5.853

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      52.78   Tc(MIN.) =   10.12
  TOTAL AREA(ACRES) =       17.3
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1089.00 =    1450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1089.00 TO NODE   1088.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1412.00  DOWNSTREAM(FEET) =  1410.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.48
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      52.78
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   10.20
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1088.00 =    1525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1088.00 TO NODE   1087.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1410.00  DOWNSTREAM(FEET) =   1295.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   365.00   CHANNEL SLOPE =  0.3151
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.697
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.57
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   0.35
  Tc(MIN.) =   10.55
  SUBAREA AREA(ACRES) =     1.81       SUBAREA RUNOFF(CFS) =    3.61
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.499
  TOTAL AREA(ACRES) =       19.1         PEAK FLOW RATE(CFS) =      54.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =  17.65
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1087.00 =    1890.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1087.00 TO NODE   1085.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1289.00  DOWNSTREAM(FEET) =  1282.00
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.23
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      54.28
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   10.81
```

```
 LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1085.00 =    2125.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1085.00 TO NODE   1085.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.81
 RAINFALL INTENSITY(INCH/HR) =   5.61
 TOTAL STREAM AREA(ACRES) =    19.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     54.28

****************************************************************************
 FLOW PROCESS FROM NODE   1111.00 TO NODE   1110.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1435.00
 DOWNSTREAM ELEVATION(FEET) =   1395.00
 ELEVATION DIFFERENCE(FEET) =     40.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      1.17
 TOTAL AREA(ACRES) =      0.42   TOTAL RUNOFF(CFS) =      1.17

****************************************************************************
 FLOW PROCESS FROM NODE   1110.00 TO NODE   1109.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1290.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   320.00   CHANNEL SLOPE =  0.3281
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.424
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3300
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   0.73
  Tc(MIN.) =    7.00
  SUBAREA AREA(ACRES) =     1.94       SUBAREA RUNOFF(CFS) =    4.75
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.334
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       5.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   8.82
  LONGEST FLOWPATH FROM NODE   1111.00 TO NODE   1109.00 =     420.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1109.00 TO NODE   1085.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1284.00  DOWNSTREAM(FEET) =  1282.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.84
  PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =    7.69
  LONGEST FLOWPATH FROM NODE   1111.00 TO NODE   1085.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1085.00 TO NODE   1085.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.69
  RAINFALL INTENSITY(INCH/HR) =   6.99
  TOTAL STREAM AREA(ACRES) =     2.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.84

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       54.28    10.81        5.609         19.10
      2        5.84     7.69        6.987          2.36

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       49.42     7.69       6.987
      2       58.97    10.81       5.609

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      58.97   Tc(MIN.) =   10.81
  TOTAL AREA(ACRES) =       21.5
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1085.00 =    2125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1085.00 TO NODE   1084.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1282.00  DOWNSTREAM(FEET) =  1279.00
  FLOW LENGTH(FEET) =   495.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.37
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      58.97
  PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =   11.79
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1084.00 =    2620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1084.00 TO NODE   1083.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1279.00  DOWNSTREAM(FEET) =  1095.00
  FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  46.13
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      58.97
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   11.91
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1083.00 =    2960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1083.00 TO NODE   1082.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1095.00  DOWNSTREAM(FEET) =   1005.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   735.00   CHANNEL SLOPE =  0.1224
```

```
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.017
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.15
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   0.93
  Tc(MIN.) =   12.85
  SUBAREA AREA(ACRES) =    10.02       SUBAREA RUNOFF(CFS) =   12.57
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.407
  TOTAL AREA(ACRES) =       31.5         PEAK FLOW RATE(CFS) =      64.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =  13.10
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1082.00 =    3695.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1082.00 TO NODE   1082.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1115.00 TO NODE   1114.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1281.00
  DOWNSTREAM ELEVATION(FEET) =   1280.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.55
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
  FLOW PROCESS FROM NODE   1114.00 TO NODE   1113.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1280.00  DOWNSTREAM ELEVATION(FEET) = 1278.00
```

```
  STREET LENGTH(FEET) =   130.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.82
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
  STREET FLOW TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =    8.29
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.656
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.75      SUBAREA RUNOFF(CFS) =    2.55
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       3.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.90
  FLOW VELOCITY(FEET/SEC.) =  2.78   DEPTH*VELOCITY(FT*FT/SEC.) =   0.90
  LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1113.00 =     195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1113.00 TO NODE   1112.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1272.00  DOWNSTREAM(FEET) =  1269.00
  FLOW LENGTH(FEET) =   395.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.49
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.05
  PIPE TRAVEL TIME(MIN.) =   1.47    Tc(MIN.) =    9.76
  LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1112.20 =     590.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1112.20 TO NODE   1112.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.76
  RAINFALL INTENSITY(INCH/HR) =   5.99
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.05

****************************************************************************
  FLOW PROCESS FROM NODE   1112.60 TO NODE   1112.40 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1278.00
  DOWNSTREAM ELEVATION(FEET) =   1277.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE   1112.40 TO NODE   1112.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1277.00  DOWNSTREAM ELEVATION(FEET) = 1275.00
  STREET LENGTH(FEET) =   260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.92
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.41
  HALFSTREET FLOOD WIDTH(FEET) =   13.97
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.38
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96
 STREET FLOW TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =    9.24
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.206
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
 SUBAREA AREA(ACRES) =    2.82      SUBAREA RUNOFF(CFS) =    8.93
 TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =       9.30

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  17.97
 FLOW VELOCITY(FEET/SEC.) =  2.78   DEPTH*VELOCITY(FT*FT/SEC.) =   1.35
 LONGEST FLOWPATH FROM NODE   1112.60 TO NODE   1112.20 =     325.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1112.20 TO NODE   1112.20 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.24
 RAINFALL INTENSITY(INCH/HR) =   6.21
 TOTAL STREAM AREA(ACRES) =     2.94
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.30

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        3.05     9.76        5.992          0.90
     2        9.30     9.24        6.206          2.94

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       12.20     9.24       6.206
     2       12.04     9.76       5.992
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      12.20   Tc(MIN.) =    9.24
 TOTAL AREA(ACRES) =        3.8
 LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1112.20 =     590.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1112.20 TO NODE   1112.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1274.00  DOWNSTREAM(FEET) =  1245.00
 FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.08
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.20
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    9.38
 LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1112.00 =     765.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1112.00 TO NODE   1082.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1245.00  DOWNSTREAM(FEET) =   1005.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   805.00   CHANNEL SLOPE =  0.2981
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.726
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2900
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.40
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.41
 AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.08
 Tc(MIN.) =   10.47
 SUBAREA AREA(ACRES) =     7.43       SUBAREA RUNOFF(CFS) =   12.34
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.365
 TOTAL AREA(ACRES) =       11.3         PEAK FLOW RATE(CFS) =      23.55

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =  13.52
 LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1082.00 =    1570.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   1082.00 TO NODE   1082.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       23.55    10.47       5.726       11.27
  LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1082.00 =    1570.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       64.32    12.85       5.017       31.48
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1082.00 =    3695.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      75.96      10.47        5.726
      2      84.96      12.85        5.017

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.96   Tc(MIN.) =   12.85
  TOTAL AREA(ACRES) =       42.8

****************************************************************************
  FLOW PROCESS FROM NODE   1082.00 TO NODE   1082.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1082.00 TO NODE   1071.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.00  DOWNSTREAM(FEET) =    980.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   155.00   CHANNEL SLOPE =  0.1613
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.976
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      85.32
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.65
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   0.17
  Tc(MIN.) =   13.01
  SUBAREA AREA(ACRES) =     0.59       SUBAREA RUNOFF(CFS) =    0.73
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.394
  TOTAL AREA(ACRES) =       43.3         PEAK FLOW RATE(CFS) =      84.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =  15.71
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1071.00 =    3850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1071.00 TO NODE   1071.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       84.99    13.01       4.976       43.34
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1071.00 =    3850.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       53.76    11.68       5.336       29.13
  LONGEST FLOWPATH FROM NODE   1074.80 TO NODE   1071.00 =    2555.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     130.04      11.68        5.336
      2     135.13      13.01        4.976

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     135.13   Tc(MIN.) =   13.01
  TOTAL AREA(ACRES) =       72.5

****************************************************************************
  FLOW PROCESS FROM NODE   1071.00 TO NODE   1071.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1071.00 TO NODE   1002.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    980.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2100.00   CHANNEL SLOPE =  0.1333
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.530
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.17
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   15.05
  SUBAREA AREA(ACRES) =    32.48       SUBAREA RUNOFF(CFS) =   38.26
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.339
  TOTAL AREA(ACRES) =      104.9         PEAK FLOW RATE(CFS) =     161.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.53   FLOW VELOCITY(FEET/SEC.) =  17.38
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1002.00 =    5950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.05
  RAINFALL INTENSITY(INCH/HR) =   4.53
  TOTAL STREAM AREA(ACRES) =   104.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    161.28

****************************************************************************
  FLOW PROCESS FROM NODE   1117.00 TO NODE   1116.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1365.00
  DOWNSTREAM ELEVATION(FEET) =   1325.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
```

```
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.59
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
 FLOW PROCESS FROM NODE   1116.00 TO NODE   1002.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1325.00  DOWNSTREAM(FEET) =    700.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2240.00   CHANNEL SLOPE =  0.2790
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.196
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.46
 AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   3.00
 Tc(MIN.) =    9.26
 SUBAREA AREA(ACRES) =    21.97       SUBAREA RUNOFF(CFS) =   36.75
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.271
 TOTAL AREA(ACRES) =       22.2         PEAK FLOW RATE(CFS) =      37.21

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =  15.08
 LONGEST FLOWPATH FROM NODE   1117.00 TO NODE   1002.00 =    2340.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.26
 RAINFALL INTENSITY(INCH/HR) =   6.20
 TOTAL STREAM AREA(ACRES) =    22.18
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.21

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      161.28    15.05        4.530        104.95
```

```
    2       37.21     9.26        6.196         22.18

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      136.47     9.26       6.196
      2      188.49    15.05       4.530

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     188.49   Tc(MIN.) =   15.05
  TOTAL AREA(ACRES) =      127.1
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1002.00 =    5950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      188.49    15.05       4.530      127.13
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1002.00 =    5950.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      541.86    12.50       5.106      303.97
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1002.00 =    7095.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     698.45      12.50        5.106
      2     669.27      15.05        4.530

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     698.45   Tc(MIN.) =   12.50
  TOTAL AREA(ACRES) =      431.1

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1001.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.00   CHANNEL SLOPE =  0.0262
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.826
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     726.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.92
  AVERAGE FLOW DEPTH(FEET) =   4.41   TRAVEL TIME(MIN.) =   1.14
  Tc(MIN.) =   13.65
  SUBAREA AREA(ACRES) =    43.22       SUBAREA RUNOFF(CFS) =   56.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.333
  TOTAL AREA(ACRES) =      474.3          PEAK FLOW RATE(CFS) =     762.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.50   FLOW VELOCITY(FEET/SEC.) =  14.09
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1001.00 =    8050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE     10.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   675.00  DOWNSTREAM(FEET) =   550.00
  FLOW LENGTH(FEET) =   755.00   MANNING'S N =  0.015
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.58
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     762.31
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   13.97
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE     10.00 =    8805.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      474.3  TC(MIN.) =     13.97
  PEAK FLOW RATE(CFS)   =     762.31
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-11.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1121	1120	2	1275	1235	70	0.35	0.16				
1120	1119	5	1235	850	750	0.3	3.59				
1119	1103	5	850	750	535	0.3	8.59				
1103	1103	1						1 OF 2			
1124	1123	2	1165	1145	70	0.35	0.06				
1123	1122	5	1145	765	690	0.29	9.16				
1122	1103	3	759	744	365						
1103	1103	1						2 OF 2			
1103	11	3	744	625	615						
							21.56				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2012 Advanced Engineering Software (aes)
              Ver. 19.0 Release Date: 06/01/2012  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                                6390 Greenwich Dr.
                                    Suite 170
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* PROPOSED HYDROLOGY                                                      *
* SUBBASIN 11                                                             *
*                                                                         *
 *************************************************************************

  FILE NAME: P-11.DAT
  TIME/DATE OF STUDY: 11:32 08/22/2014
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1121.00 TO NODE   1120.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1275.00
  DOWNSTREAM ELEVATION(FEET) =   1235.00
  ELEVATION DIFFERENCE(FEET) =    40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.45
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
 FLOW PROCESS FROM NODE   1120.00 TO NODE   1119.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1235.00  DOWNSTREAM(FEET) =    850.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   750.00   CHANNEL SLOPE =  0.5133
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.018
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.13
 AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   1.37
 Tc(MIN.) =    7.64
 SUBAREA AREA(ACRES) =     3.59       SUBAREA RUNOFF(CFS) =    7.56
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.302
 TOTAL AREA(ACRES) =        3.8         PEAK FLOW RATE(CFS) =       7.95

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =  11.14
 LONGEST FLOWPATH FROM NODE   1121.00 TO NODE   1119.00 =     850.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1119.00 TO NODE   1103.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =    750.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   535.00   CHANNEL SLOPE =  0.1869
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.546
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.26
 AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.87
 Tc(MIN.) =    8.50
 SUBAREA AREA(ACRES) =     8.59       SUBAREA RUNOFF(CFS) =   16.87
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.301
 TOTAL AREA(ACRES) =       12.3         PEAK FLOW RATE(CFS) =      24.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =  11.51
 LONGEST FLOWPATH FROM NODE   1121.00 TO NODE   1103.00 =    1385.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1103.00 TO NODE   1103.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.50
  RAINFALL INTENSITY(INCH/HR) =   6.55
  TOTAL STREAM AREA(ACRES) =    12.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.29

****************************************************************************
  FLOW PROCESS FROM NODE   1124.00 TO NODE   1123.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1165.00
  DOWNSTREAM ELEVATION(FEET) =   1145.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.243
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.944
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
  FLOW PROCESS FROM NODE   1123.00 TO NODE   1122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =    765.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.00   CHANNEL SLOPE =  0.5507
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.074
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.76
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   0.90
  Tc(MIN.) =    6.14
  SUBAREA AREA(ACRES) =     9.16       SUBAREA RUNOFF(CFS) =   21.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.290
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      21.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =  16.06
  LONGEST FLOWPATH FROM NODE   1124.00 TO NODE   1122.00 =     760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1122.00 TO NODE   1103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   759.00  DOWNSTREAM(FEET) =   744.00
  FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.75
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.62
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    6.59
  LONGEST FLOWPATH FROM NODE   1124.00 TO NODE   1103.00 =    1125.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1103.00 TO NODE   1103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.59
  RAINFALL INTENSITY(INCH/HR) =   7.72
  TOTAL STREAM AREA(ACRES) =     9.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.62

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       24.29     8.50        6.546         12.34
      2       21.62     6.59        7.720          9.22

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       40.43     6.59       7.720
      2       42.62     8.50       6.546

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.62   Tc(MIN.) =    8.50
  TOTAL AREA(ACRES) =       21.6
  LONGEST FLOWPATH FROM NODE   1121.00 TO NODE   1103.00 =    1385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1103.00 TO NODE     11.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   744.00  DOWNSTREAM(FEET) =   625.00
  FLOW LENGTH(FEET) =   615.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.27
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.62
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    8.87
  LONGEST FLOWPATH FROM NODE   1121.00 TO NODE     11.00 =    2000.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       21.6  TC(MIN.) =      8.87
  PEAK FLOW RATE(CFS)   =      42.62
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-13d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1321	1320	2	1278	1275	95	0.57	0.22				
1320	1319	6	1275	1269	655	0.52	4.03	2 sides			
1319	1313	3	1263	1262	75						
1313	1313	1						1 of 2			
1316	1315	2	1282	1279.5	87	0.51	0.09				
1315	1314	6	1279.5	1269.5	360	0.51	2.93	2 sides			
1314	1313	3	1263	1262	70						
1313	1313	1						2 of 2			
1313	1309	3	1262	1261	120						
1309	1309	1						1 of 3			
1312	1311	2	1275	1274	65	0.51	0.11				
1311	1310	5	1274	1269	335	0.51	0.51				
1310	1309	3	1263	1261	30						
1309	1309	1						2 of 3			
1318	1317	2	1275	1270	85	0.51	0.15				
1317	1309	6	1270	1267	250	0.51	0.47	Two sides			
1309	1309	1						3 of 3			
1309	1308	3	1261	1260.5	45						
1308	1307	5	1260.5	1257.5	590	0.53	1.05				
1307	1307	1						1 of 2			
1323	1322	2	1274	1272	80	0.57	0.15				
1322	1306	6	1272	1267	315	0.57	4.48	1 side			
1306	1307	3	1263	1257.5	120						
1307	1307	1						2 of 2			
1307	1307	7	Tc= 14.56, A = 14.1, Q = 13.1 cfs								
1307	1305.5	3	1257.5	1255.2	115						
1305.5	1305.5	1						1 of 2			
1305.8	1305.7	2	1287	1285	100	0.51	0.13				
1305.7	1305.6	6	1285	1275	570	0.56	4.71	one side			
1305.6	1305.5	3	1269	1255.2	525						
1305.5	1305.5	1						2 of 2			
1305.5	1305	3	1255.2	1252.7	125						
1305	1304	3	1252.7	1105	320						
1304	1303	5	1105	835	1225	0.34	13.15				
1303	1303	10						save to bank 1 - 1303			

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Newland Sierra

Job #: 2660-02

Run Name:
P-13d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2564	2563	2	1273	1271	80	0.54	0.16				
2563	2563.1	6	1271	1269	230	0.51	1.93	2 SIDES			
2563.1	2562	3	1266	1261	210						
2562	2562	1						1 OF 2			
2563.1	2563.2	2	1269	1268	65	0.51	0.55				
2563.2	2562	6	1268	1267	120	0.51	0.55	2 SIDES			
2562	2562	1						2 OF 2			
2562	2558	3	1261	1260	140						
2558	2558	10						SAVE TO BANK 2 - 2558			
2561	2560	2	1275	1274	50	0.51	0.13				
2560	2560.1	6	1274	1269	315	0.51	1.96	2 SIDES			
2560.1	2559	3	1263	1262	160						
2559	2559	1						1 OF 2			
2560.1	2560.2	2	1269	1268.8	50	0.51	0.4				
2560.2	2559	6	1268.8	1268	115	0.51	0.97	2 SIDES			
2559	2559	1						2 OF 2			
2559	2558	3	1262	1260	40						
2558	2558	11						ADD BANK 2 - 2558			
2558	2558	12						CLEAR BANK 2			
2558	2554	3	1260	1257.8	225						
2554	2554	1						1 OF 2			
2557	2556	2	1271	1270	65	0.51	0.16				
2556	2555	6	1270	1264	488	0.51	3.46	1 SIDE			
2555	2554	3	1258	1257.8	10						
2554	2554	1						2 OF 2			
2554	2552.5	3	1257.8	1252.8	515						
2552.5	2552.5	7	Tc=10.84 A=10.3 Q=9.1								
2552.5	2552	5	1252.8	1250.8	185			VALLEY			
2552	1303	5	1250.8	835	1400			MTN			
2552	1303	8				0.27	20.83				
1303	1303	10						save to bank 2 - 1303			
1335	1334	2	1293	1291	83	0.57	0.13				
1334	1333.8	6	1291	1280	270	0.57	1.74	1 SIDE			
1333.8	1333.8	1						1 of 2			
1334.8	1334.6	2	1287	1285	80	0.57	0.11				

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Newland Sierra

Job #: 2660-02

Run Name:
P-13d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1334.6	1334.4	6	1285	1284	50	0.55	0.46	2 SIDES			
1334.4	1333.8	3	1278	1276	200						
1333.8	1333.8	1						2 of 2			
1333.8	1333.4	3	1276	1273	100						
1333.4	1333.4	1						1 of 2			
1333	1333	2	1281	1280	80	0.56	0.29				
1333	1333.4	3	1274	1273	50						
1333.4	1333.4	1						2 of 2			
1333.4	1332	3	1273	1267	210						
1332	1332	1						1 of 2			
1337	1336	2	1278	1276	80	0.51	0.07				
1336	1335	6	1276	1273	240	0.51	0.53	2 SIDES			
1335	1332	3	1268	1267	30						
1332	1332	1						2 of 2			
1332	1330	3	1267	1265	150						
1330	1330	10	clean - left flow					save to bank 3 - 1330			
1353	1352	2	1284	1282	80	0.51	0.14				
1352	1351	6	1282	1278	270	0.51	0.79	2 SIDES			
1351	1350.4	3	1272	1267	280						
1350.4	1350.4	1						1 of 2			
1350.8	1350.6	2	1278	1276	80	0.51	0.10				
1350.6	1350.4	6	1276	1267	160	0.52	2.00	1 SIDE			
1350.4	1350.4	1						2 of 2			
1350.4	1346	3	1267	1265	60			WQ in			
1346	1330	3	1265	1255	850			WQ out			
1330	1330	11	clean - right flow					add bank 3			
1330	1330	12						clear bank 3			
1330	1326	5	1255	1120	410			MTN			
1330	1326	8				0.3	2.34				
1326	1326	1						1 of 2			
1328	1327	2	1325	1315	80	0.35	0.24				
1327	1326	5	1315	1120	1075			MTN			
1327	1326	8				0.3	6.90				
1326	1326	1						2 of 2			

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Job #: 2660-02

Run Name:
P-13d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1326	1303	5	1120	835	965			MTN			
1326	1303	8				0.27	8.99				
1303	1303	11						add bank 1			
1303	1303	11						add bank 2			
1303	1303	12						clear bank 1			
1303	1303	12						clear bank 2			
1303	1302	5	835	775	520			MTN			
1303	1302	8				0.29	9.18				
1302	1302	10						save to bank 1			
1339	1338	2	1284	1282	85	0.51	0.06				
1338	1337.8	6	1282	1276	165	0.51	0.98				
1337.8	1337.6	3	1270	1266	255						
1337.6	1337.6	1						1 of 2			
1345	1344	2	1277	1275	80	0.51	0.13				
1344	1343.8	6	1275	1272	210	0.52	0.69	1 SIDE			
1343.8	1337.6	3	1266.5	1266	50						
1337.6	1337.6	1						2 of 2			
1337.6	1345.6	3	1266	1264	125						
1345.6	1345.6	1						1 of 2			
1345.9	1345.8	2	1280	1278	100	0.57	0.13				
1345.8	1343	6	1278	1269.5	315	0.56	1.25	1 SIDE			
1343	1345.6	3	1264.5	1264	40						
1345.6	1345.6	1						2 of 2			
1345.6	1346.8	3	1264	1262	170						
1346.8	1346.8	1						1 of 3			
1348	1347	2	1275	1273	80	0.51	0.10				
1347	1346.9	6	1273	1265	150	0.52	0.97	2 SIDES			
1346.9	1346.8	3	1262.5	1262	50						
1346.8	1346.8	1						2 of 3			
1347.6	1347.5	2	1270	1268	100	0.57	0.15	1 SIDE			
1347.5	1347.4	6	1268	1265	110	0.54	1.69				
1347.4	1346.8	3	1262.5	1262	40						
1346.8	1346.8	1						3 of 3			
1346.8	1342	3	1262	1261.5	50						
1342	1342	1						1 of 2			

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Job #: 2660-02

Run Name:
P-13d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1347.9	1347.8	2	1272	1270	85	0.51	0.10				
1347.8	1347.7	6	1270	1269	100	0.51	0.80	2 SIDES			
1347.7	1342	3	1263	1261.5	150						
1342	1342	1						2 of 2			
1342	1341.5	3	1261.5	1260	150						
1341.5	1341	5	1260	1259.5	50						
1341.5	1341	8				0.35	0.51	WQ in			
1341	1340.8	3	1253	1215	100			WQ out			
1340.8	1340	5	1215	1030	800						
1340.8	1340	8				0.27	6.19				
1340	1340	1						1 of 2			
1356.1	1350	2	1280	1235	100	0.57	0.29				
1350	1340	5	1235	1030	600						
1350	1340	8				0.28	5.56				
1340	1340	1						2 of 2			
1340	1302	5	1030	775	1505						
1340	1302	8				0.28	25.68				
1302	1302	11						add bank 1			
1302	1301	5	775	760	220						
1301	13	4	760	670	665			Ex 36" RCP Caltrans			
							142.57				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                     *
* SUB BASIN 13 - WITH DETENTION AT NODE 1307 AND 2552.5                  *
*                                                                        *
 **************************************************************************

  FILE NAME: P-13D.DAT
  TIME/DATE OF STUDY: 13:27 02/23/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
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****************************************************************************
  FLOW PROCESS FROM NODE   1321.00 TO NODE   1320.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1278.00
  DOWNSTREAM ELEVATION(FEET) =   1275.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
  SUBAREA RUNOFF(CFS) =      0.99
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      0.99

****************************************************************************
  FLOW PROCESS FROM NODE   1320.00 TO NODE   1319.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1275.00  DOWNSTREAM ELEVATION(FEET) = 1269.00
  STREET LENGTH(FEET) =   655.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.94
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.85
  STREET FLOW TRAVEL TIME(MIN.) =   4.64   Tc(MIN.) =   10.98
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.552
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
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  AREA-AVERAGE RUNOFF COEFFICIENT =  0.523
  SUBAREA AREA(ACRES) =    4.03      SUBAREA RUNOFF(CFS) =   11.63
  TOTAL AREA(ACRES) =        4.2        PEAK FLOW RATE(CFS) =      12.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.78
  FLOW VELOCITY(FEET/SEC.) =  2.68   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1319.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1319.00 TO NODE   1313.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1262.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.83
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.33
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   11.14
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1313.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1313.00 TO NODE   1313.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.14
  RAINFALL INTENSITY(INCH/HR) =   5.50
  TOTAL STREAM AREA(ACRES) =     4.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.33

****************************************************************************
  FLOW PROCESS FROM NODE   1316.00 TO NODE   1315.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.00
  UPSTREAM ELEVATION(FEET) =   1282.00
  DOWNSTREAM ELEVATION(FEET) =   1279.50
  ELEVATION DIFFERENCE(FEET) =      2.50
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  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.968
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.445
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE   1315.00 TO NODE   1314.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1279.50  DOWNSTREAM ELEVATION(FEET) = 1269.50
  STREET LENGTH(FEET) =   360.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.16
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
  STREET FLOW TRAVEL TIME(MIN.) =   1.78   Tc(MIN.) =    8.75
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.430
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    2.93      SUBAREA RUNOFF(CFS) =    9.61
  TOTAL AREA(ACRES) =        3.0        PEAK FLOW RATE(CFS) =       9.90

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.72
  FLOW VELOCITY(FEET/SEC.) =  3.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.33
  LONGEST FLOWPATH FROM NODE   1316.00 TO NODE   1314.00 =     447.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1314.00 TO NODE   1313.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
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  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1262.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.54
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.90
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    8.90
  LONGEST FLOWPATH FROM NODE   1316.00 TO NODE   1313.00 =     517.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1313.00 TO NODE   1313.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.90
  RAINFALL INTENSITY(INCH/HR) =   6.36
  TOTAL STREAM AREA(ACRES) =     3.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.90

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       12.33    11.14        5.500          4.25
      2        9.90     8.90        6.357          3.02

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.75     8.90       6.357
      2       20.90    11.14       5.500

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.90   Tc(MIN.) =   11.14
  TOTAL AREA(ACRES) =        7.3
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1313.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1313.00 TO NODE   1309.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
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```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1262.00  DOWNSTREAM(FEET) =  1261.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.46
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.90
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =   11.41
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1309.00 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1309.00 TO NODE   1309.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.41
  RAINFALL INTENSITY(INCH/HR) =   5.42
  TOTAL STREAM AREA(ACRES) =     7.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.90

****************************************************************************
  FLOW PROCESS FROM NODE   1312.00 TO NODE   1311.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1275.00
  DOWNSTREAM ELEVATION(FEET) =   1274.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE   1311.00 TO NODE   1310.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1274.00  DOWNSTREAM(FEET) =   1269.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0149
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  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.718
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.82
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   3.07
  Tc(MIN.) =   10.49
  SUBAREA AREA(ACRES) =     0.51       SUBAREA RUNOFF(CFS) =    1.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       1.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   2.15
  LONGEST FLOWPATH FROM NODE   1312.00 TO NODE   1310.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1310.00 TO NODE   1309.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1261.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.40
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.81
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.55
  LONGEST FLOWPATH FROM NODE   1312.00 TO NODE   1309.00 =     430.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1309.00 TO NODE   1309.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.55
  RAINFALL INTENSITY(INCH/HR) =   5.70
  TOTAL STREAM AREA(ACRES) =     0.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.81

****************************************************************************
  FLOW PROCESS FROM NODE   1318.00 TO NODE   1317.00 IS CODE =  21
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------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1275.00
  DOWNSTREAM ELEVATION(FEET) =   1270.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.424
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.750
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.67

******************************************************************************
  FLOW PROCESS FROM NODE   1317.00 TO NODE   1309.00 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1270.00  DOWNSTREAM ELEVATION(FEET) = 1267.00
  STREET LENGTH(FEET) =   250.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.51
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.44
  STREET FLOW TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =    7.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.021
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.47      SUBAREA RUNOFF(CFS) =    1.68
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.22
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.58
  FLOW VELOCITY(FEET/SEC.) =  2.01   DEPTH*VELOCITY(FT*FT/SEC.) =   0.52
  LONGEST FLOWPATH FROM NODE   1318.00 TO NODE   1309.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1309.00 TO NODE   1309.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.63
  RAINFALL INTENSITY(INCH/HR) =   7.02
  TOTAL STREAM AREA(ACRES) =     0.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.22

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.90    11.41        5.417          7.27
      2        1.81    10.55        5.698          0.62
      3        2.22     7.63        7.021          0.62

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.65     7.63       7.021
      2       23.48    10.55       5.698
      3       24.33    11.41       5.417

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      24.33   Tc(MIN.) =   11.41
  TOTAL AREA(ACRES) =        8.5
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1309.00 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1309.00 TO NODE   1308.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1261.00  DOWNSTREAM(FEET) =  1260.50
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  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.63
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.33
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   11.50
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1308.00 =     990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1308.00 TO NODE   1307.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1260.50  DOWNSTREAM(FEET) =   1257.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   590.00   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.628
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.21
  AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   3.06
  Tc(MIN.) =   14.56
  SUBAREA AREA(ACRES) =     1.05       SUBAREA RUNOFF(CFS) =    2.58
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.518
  TOTAL AREA(ACRES) =        9.6         PEAK FLOW RATE(CFS) =      24.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   3.17
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1307.00 =    1580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1307.00 TO NODE   1307.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.56
  RAINFALL INTENSITY(INCH/HR) =   4.63
  TOTAL STREAM AREA(ACRES) =     9.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.33

****************************************************************************
  FLOW PROCESS FROM NODE   1323.00 TO NODE   1322.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1274.00
  DOWNSTREAM ELEVATION(FEET) =   1272.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.955
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE   1322.00 TO NODE   1306.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1272.00  DOWNSTREAM ELEVATION(FEET) = 1267.00
  STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.62
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.63
  STREET FLOW TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =    7.71
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.973
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    4.48      SUBAREA RUNOFF(CFS) =   17.81
  TOTAL AREA(ACRES) =        4.6        PEAK FLOW RATE(CFS) =      18.40
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.00   DEPTH*VELOCITY(FT*FT/SEC.) =   1.94
  LONGEST FLOWPATH FROM NODE   1323.00 TO NODE   1306.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1306.00 TO NODE   1307.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1257.50
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.58
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.40
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    7.86
  LONGEST FLOWPATH FROM NODE   1323.00 TO NODE   1307.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1307.00 TO NODE   1307.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.86
  RAINFALL INTENSITY(INCH/HR) =   6.89
  TOTAL STREAM AREA(ACRES) =     4.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       24.33    14.56        4.628          9.56
      2       18.40     7.86        6.889          4.63

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       34.75     7.86       6.889
      2       36.69    14.56       4.628
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      36.69   Tc(MIN.) =   14.56
  TOTAL AREA(ACRES) =       14.2
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1307.00 =    1580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1307.00 TO NODE   1307.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  14.56   RAIN INTENSITY(INCH/HOUR) =  4.63
  TOTAL AREA(ACRES) =    14.10   TOTAL RUNOFF(CFS) =     13.10

****************************************************************************
  FLOW PROCESS FROM NODE   1307.00 TO NODE   1305.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1257.50  DOWNSTREAM(FEET) =  1255.20
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.06
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.10
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   14.77
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1305.50 =    1695.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1305.50 TO NODE   1305.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.77
  RAINFALL INTENSITY(INCH/HR) =   4.59
  TOTAL STREAM AREA(ACRES) =    14.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.10

****************************************************************************
  FLOW PROCESS FROM NODE   1305.80 TO NODE   1305.70 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1287.00
  DOWNSTREAM ELEVATION(FEET) =   1285.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.539
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.076
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE   1305.70 TO NODE   1305.60 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1285.00  DOWNSTREAM ELEVATION(FEET) = 1275.00
  STREET LENGTH(FEET) =   570.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.22
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
  STREET FLOW TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =   10.12
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.853
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.559
  SUBAREA AREA(ACRES) =    4.71      SUBAREA RUNOFF(CFS) =   15.44
  TOTAL AREA(ACRES) =        4.8        PEAK FLOW RATE(CFS) =      15.83
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.20   DEPTH*VELOCITY(FT*FT/SEC.) =   2.04
  LONGEST FLOWPATH FROM NODE   1305.80 TO NODE   1305.60 =     670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1305.60 TO NODE   1305.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1269.00  DOWNSTREAM(FEET) =  1255.20
  FLOW LENGTH(FEET) =   525.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.42
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.83
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =   10.96
  LONGEST FLOWPATH FROM NODE   1305.80 TO NODE   1305.50 =    1195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1305.50 TO NODE   1305.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.96
  RAINFALL INTENSITY(INCH/HR) =   5.56
  TOTAL STREAM AREA(ACRES) =     4.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.10    14.77        4.585         14.10
      2       15.83    10.96        5.560          4.84

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       25.54    10.96       5.560
      2       26.15    14.77       4.585
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.15   Tc(MIN.) =   14.77
  TOTAL AREA(ACRES) =       18.9
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1305.50 =    1695.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1305.50 TO NODE   1305.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1255.20  DOWNSTREAM(FEET) =  1252.70
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.87
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.15
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   14.96
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1305.00 =    1820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1305.00 TO NODE   1304.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1252.70  DOWNSTREAM(FEET) =  1105.00
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  35.84
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.15
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   15.11
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1304.00 =    2140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1304.00 TO NODE   1303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1225.00   CHANNEL SLOPE =  0.2204
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.252
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.70
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   1.49
  Tc(MIN.) =   16.60
  SUBAREA AREA(ACRES) =    13.15       SUBAREA RUNOFF(CFS) =   19.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.312
  TOTAL AREA(ACRES) =       32.1         PEAK FLOW RATE(CFS) =      42.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =  14.46
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1303.00 =    3365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2564.00 TO NODE   2563.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5400
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1273.00
  DOWNSTREAM ELEVATION(FEET) =   1271.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.643
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.677
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE   2563.00 TO NODE   2563.10 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1271.00  DOWNSTREAM ELEVATION(FEET) = 1269.00
  STREET LENGTH(FEET) =   230.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.24
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.62
  STREET FLOW TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =    8.56
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.521
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.512
  SUBAREA AREA(ACRES) =    1.93      SUBAREA RUNOFF(CFS) =    6.42
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       6.98

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.84
  FLOW VELOCITY(FEET/SEC.) =  2.30   DEPTH*VELOCITY(FT*FT/SEC.) =   0.83
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2563.10 =     310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2563.10 TO NODE   2562.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1266.00  DOWNSTREAM(FEET) =  1261.00
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.49
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.98
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =    8.97
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2562.00 =     520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2562.00 TO NODE   2562.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.97
  RAINFALL INTENSITY(INCH/HR) =   6.33
  TOTAL STREAM AREA(ACRES) =     2.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.98

****************************************************************************
  FLOW PROCESS FROM NODE   2563.10 TO NODE   2563.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1269.00
  DOWNSTREAM ELEVATION(FEET) =   1268.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      0.55   TOTAL RUNOFF(CFS) =      2.01

****************************************************************************
  FLOW PROCESS FROM NODE   2563.20 TO NODE   2562.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1268.00  DOWNSTREAM ELEVATION(FEET) = 1267.00
  STREET LENGTH(FEET) =   120.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.92
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
```

```
   HALFSTREET FLOOD WIDTH(FEET) =    8.17
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.54
  STREET FLOW TRAVEL TIME(MIN.) =   1.08   Tc(MIN.) =    8.49
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.553
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.55      SUBAREA RUNOFF(CFS) =    1.84
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       3.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.10
  FLOW VELOCITY(FEET/SEC.) =  1.94   DEPTH*VELOCITY(FT*FT/SEC.) =   0.60
  LONGEST FLOWPATH FROM NODE   2563.10 TO NODE   2562.00 =     185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2562.00 TO NODE   2562.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.49
  RAINFALL INTENSITY(INCH/HR) =   6.55
  TOTAL STREAM AREA(ACRES) =     1.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.68

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.98     8.97        6.326          2.09
      2        3.68     8.49        6.553          1.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.29     8.49       6.553
      2       10.53     8.97       6.326

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.53   Tc(MIN.) =    8.97
  TOTAL AREA(ACRES) =        3.2
```

```
 LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2562.00 =     520.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2562.00 TO NODE   2558.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1261.00  DOWNSTREAM(FEET) =  1260.00
 FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.90
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.53
 PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    9.36
 LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2558.00 =     660.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2558.00 TO NODE   2558.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2561.00 TO NODE   2560.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
 UPSTREAM ELEVATION(FEET) =   1275.00
 DOWNSTREAM ELEVATION(FEET) =   1274.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.960
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.234
 SUBAREA RUNOFF(CFS) =      0.55
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
 FLOW PROCESS FROM NODE   2560.00 TO NODE   2560.10 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1274.00  DOWNSTREAM ELEVATION(FEET) = 1269.00
 STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
```

```
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.74
  STREET FLOW TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =    8.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.801
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.96      SUBAREA RUNOFF(CFS) =    6.80
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       7.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.59
  FLOW VELOCITY(FEET/SEC.) =  2.92   DEPTH*VELOCITY(FT*FT/SEC.) =   0.99
  LONGEST FLOWPATH FROM NODE   2561.00 TO NODE   2560.10 =     365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2560.10 TO NODE   2559.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1262.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.06
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.25
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    8.54
  LONGEST FLOWPATH FROM NODE   2561.00 TO NODE   2559.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2559.00 TO NODE   2559.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.54
  RAINFALL INTENSITY(INCH/HR) =   6.53
  TOTAL STREAM AREA(ACRES) =     2.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.25

************************************************************************
  FLOW PROCESS FROM NODE   2560.10 TO NODE   2560.20 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1269.00
  DOWNSTREAM ELEVATION(FEET) =   1268.80
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.461
  WARNING: THE MINIMUM OVERLAND FLOW SLOPE, 0.5%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.112
  SUBAREA RUNOFF(CFS) =      1.25
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      1.25

************************************************************************
  FLOW PROCESS FROM NODE   2560.20 TO NODE   2559.00 IS CODE =  62
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1268.80  DOWNSTREAM ELEVATION(FEET) = 1268.00
  STREET LENGTH(FEET) =   115.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.65
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.49
  STREET FLOW TRAVEL TIME(MIN.) =   1.14   Tc(MIN.) =   10.60
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.681
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.97      SUBAREA RUNOFF(CFS) =    2.81
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       3.97

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.77
  FLOW VELOCITY(FEET/SEC.) =  1.85   DEPTH*VELOCITY(FT*FT/SEC.) =   0.60
  LONGEST FLOWPATH FROM NODE   2560.10 TO NODE   2559.00 =     165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2559.00 TO NODE   2559.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.60
  RAINFALL INTENSITY(INCH/HR) =   5.68
  TOTAL STREAM AREA(ACRES) =     1.37
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.25     8.54        6.528          2.09
      2        3.97    10.60        5.681          1.37

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.45     8.54       6.528
      2       10.28    10.60       5.681

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      10.45   Tc(MIN.) =    8.54
  TOTAL AREA(ACRES) =        3.5
  LONGEST FLOWPATH FROM NODE   2561.00 TO NODE   2559.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2559.00 TO NODE   2558.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1262.00  DOWNSTREAM(FEET) =  1260.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.41
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.45
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.60
  LONGEST FLOWPATH FROM NODE   2561.00 TO NODE   2558.00 =     565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2558.00 TO NODE   2558.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.45     8.60       6.501        3.46
  LONGEST FLOWPATH FROM NODE   2561.00 TO NODE   2558.00 =     565.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.53     9.36       6.153        3.19
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2558.00 =     660.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      20.12       8.60        6.501
      2      20.42       9.36        6.153

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.42   Tc(MIN.) =    9.36
  TOTAL AREA(ACRES) =        6.7
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2558.00 TO NODE   2558.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2558.00 TO NODE   2554.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1260.00  DOWNSTREAM(FEET) =  1257.80
  FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.69
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.42
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =    9.85
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2554.00 =     885.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2554.00 TO NODE   2554.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.85
  RAINFALL INTENSITY(INCH/HR) =   5.95
  TOTAL STREAM AREA(ACRES) =     6.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.42

****************************************************************************
  FLOW PROCESS FROM NODE   2557.00 TO NODE   2556.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1271.00
  DOWNSTREAM ELEVATION(FEET) =   1270.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.58
```

```
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   2556.00 TO NODE   2555.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1270.00  DOWNSTREAM ELEVATION(FEET) = 1264.00
  STREET LENGTH(FEET) =   488.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   13.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.17
  STREET FLOW TRAVEL TIME(MIN.) =   2.75   Tc(MIN.) =   10.16
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.836
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    3.46      SUBAREA RUNOFF(CFS) =   10.30
  TOTAL AREA(ACRES) =        3.6        PEAK FLOW RATE(CFS) =      10.77

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.34
  FLOW VELOCITY(FEET/SEC.) =  3.45   DEPTH*VELOCITY(FT*FT/SEC.) =   1.63
  LONGEST FLOWPATH FROM NODE   2557.00 TO NODE   2555.00 =     553.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2555.00 TO NODE   2554.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1258.00  DOWNSTREAM(FEET) =  1257.80
```

```
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.77
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   10.18
  LONGEST FLOWPATH FROM NODE   2557.00 TO NODE   2554.00 =     563.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2554.00 TO NODE   2554.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.18
  RAINFALL INTENSITY(INCH/HR) =   5.83
  TOTAL STREAM AREA(ACRES) =     3.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.77

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.42     9.85        5.955          6.65
      2       10.77    10.18        5.829          3.62

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       30.84     9.85       5.955
      2       30.76    10.18       5.829

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.84   Tc(MIN.) =    9.85
  TOTAL AREA(ACRES) =       10.3
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2554.00 =     885.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2554.00 TO NODE   2552.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1257.80  DOWNSTREAM(FEET) =  1252.80
```

```
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.69
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.84
  PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =   10.84
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2552.50 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2552.50 TO NODE   2552.50 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.84   RAIN INTENSITY(INCH/HOUR) =  5.60
  TOTAL AREA(ACRES) =    10.30   TOTAL RUNOFF(CFS) =      9.10

****************************************************************************
  FLOW PROCESS FROM NODE   2552.50 TO NODE   2552.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1252.80  DOWNSTREAM(FEET) =   1250.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   185.00   CHANNEL SLOPE =  0.0108
  CHANNEL FLOW THRU SUBAREA(CFS) =       9.10
  FLOW VELOCITY(FEET/SEC) =   2.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.22   Tc(MIN.) =   12.06
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   2552.00 =    1585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2552.00 TO NODE   1303.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1250.80  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1400.00   CHANNEL SLOPE =  0.2970
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1943 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       9.10
  FLOW VELOCITY(FEET/SEC) =   5.15 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.53   Tc(MIN.) =   16.59
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   1303.00 =    2985.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2552.00 TO NODE   1303.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.255
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2329
  SUBAREA AREA(ACRES) =   20.83   SUBAREA RUNOFF(CFS) =   23.93
  TOTAL AREA(ACRES) =       31.1   TOTAL RUNOFF(CFS) =      30.85
  TC(MIN.) =   16.59

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1335.00 TO NODE   1334.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.00
  UPSTREAM ELEVATION(FEET) =   1293.00
  DOWNSTREAM ELEVATION(FEET) =   1291.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.483
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.799
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   1334.00 TO NODE   1333.80 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1291.00  DOWNSTREAM ELEVATION(FEET) = 1280.00
  STREET LENGTH(FEET) =   270.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.10
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.33
  STREET FLOW TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =    7.52
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.085
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.74      SUBAREA RUNOFF(CFS) =    7.03
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       7.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.84
  FLOW VELOCITY(FEET/SEC.) =  4.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.80
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1333.80 =     353.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1333.80 TO NODE   1333.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.52
  RAINFALL INTENSITY(INCH/HR) =   7.09
  TOTAL STREAM AREA(ACRES) =     1.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.55

****************************************************************************
  FLOW PROCESS FROM NODE   1334.80 TO NODE   1334.60 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1287.00
  DOWNSTREAM ELEVATION(FEET) =   1285.00
```

```
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.955
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   1334.60 TO NODE   1334.40 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1285.00  DOWNSTREAM ELEVATION(FEET) = 1284.00
  STREET LENGTH(FEET) =    50.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    4.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.32
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.50
  STREET FLOW TRAVEL TIME(MIN.) =   0.36   Tc(MIN.) =    6.65
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.675
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.554
  SUBAREA AREA(ACRES) =    0.46      SUBAREA RUNOFF(CFS) =    1.94
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.05
  FLOW VELOCITY(FEET/SEC.) =  2.50   DEPTH*VELOCITY(FT*FT/SEC.) =   0.62
  LONGEST FLOWPATH FROM NODE   1334.80 TO NODE   1334.40 =     130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1334.40 TO NODE   1333.80 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1278.00  DOWNSTREAM(FEET) =  1276.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.65
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.42
  PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =    7.36
  LONGEST FLOWPATH FROM NODE   1334.80 TO NODE   1333.80 =     330.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1333.80 TO NODE   1333.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.36
  RAINFALL INTENSITY(INCH/HR) =   7.18
  TOTAL STREAM AREA(ACRES) =     0.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.55     7.52        7.085          1.87
      2        2.42     7.36        7.185          0.57

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.81     7.36       7.185
      2        9.94     7.52       7.085

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.94   Tc(MIN.) =    7.52
  TOTAL AREA(ACRES) =        2.4
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1333.80 =     353.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1333.80 TO NODE   1333.40 IS CODE =  31
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1276.00  DOWNSTREAM(FEET) =  1273.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.11
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.94
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.69
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1333.40 =     453.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1333.40 TO NODE   1333.40 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.69
  RAINFALL INTENSITY(INCH/HR) =   6.99
  TOTAL STREAM AREA(ACRES) =     2.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.94

****************************************************************************
  FLOW PROCESS FROM NODE   1333.00 TO NODE   1333.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1281.00
  DOWNSTREAM ELEVATION(FEET) =   1280.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.482
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    68.75
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.111
  SUBAREA RUNOFF(CFS) =      1.15
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.15

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1333.00 TO NODE   1333.40 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1274.00  DOWNSTREAM(FEET) =  1273.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.81
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.15
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    7.65
 LONGEST FLOWPATH FROM NODE   1333.00 TO NODE   1333.40 =     130.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1333.40 TO NODE   1333.40 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.65
 RAINFALL INTENSITY(INCH/HR) =   7.01
 TOTAL STREAM AREA(ACRES) =     0.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.15

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        9.94     7.69        6.987          2.44
     2        1.15     7.65        7.006          0.29

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       11.07     7.65       7.006
     2       11.09     7.69       6.987

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.09   Tc(MIN.) =    7.69
 TOTAL AREA(ACRES) =        2.7
 LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1333.40 =     453.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1333.40 TO NODE   1332.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1273.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.18
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.09
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    8.03
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1332.00 =     663.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1332.00 TO NODE   1332.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.03
  RAINFALL INTENSITY(INCH/HR) =   6.79
  TOTAL STREAM AREA(ACRES) =     2.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.09

****************************************************************************
  FLOW PROCESS FROM NODE   1337.00 TO NODE   1336.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1278.00
  DOWNSTREAM ELEVATION(FEET) =   1276.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE   1336.00 TO NODE   1335.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1276.00  DOWNSTREAM ELEVATION(FEET) = 1273.00
  STREET LENGTH(FEET) =   240.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.82
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.39
  STREET FLOW TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =    9.20
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.224
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.53      SUBAREA RUNOFF(CFS) =    1.68
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       1.90

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   5.98
  FLOW VELOCITY(FEET/SEC.) =  2.00   DEPTH*VELOCITY(FT*FT/SEC.) =   0.49
  LONGEST FLOWPATH FROM NODE   1337.00 TO NODE   1335.00 =     320.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1335.00 TO NODE   1332.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1268.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.67
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.90
```

```
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE   1337.00 TO NODE   1332.00 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1332.00 TO NODE   1332.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   6.19
  TOTAL STREAM AREA(ACRES) =     0.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.90

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.09     8.03        6.793          2.73
      2        1.90     9.27        6.191          0.60

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.74     8.03       6.793
      2       12.02     9.27       6.191

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.74   Tc(MIN.) =    8.03
  TOTAL AREA(ACRES) =        3.3
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1332.00 =     663.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1332.00 TO NODE   1330.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1267.00  DOWNSTREAM(FEET) =  1265.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.89
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.74
```

```
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    8.35
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1330.00 =     813.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1330.00 TO NODE   1330.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1353.00 TO NODE   1352.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1284.00
  DOWNSTREAM ELEVATION(FEET) =   1282.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   1352.00 TO NODE   1351.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1282.00  DOWNSTREAM ELEVATION(FEET) = 1278.00
  STREET LENGTH(FEET) =   270.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
```

```
    HALFSTREET FLOOD WIDTH(FEET) =    5.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.50
  STREET FLOW TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =    9.12
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.259
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    2.52
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       2.97

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.18
  FLOW VELOCITY(FEET/SEC.) =  2.34   DEPTH*VELOCITY(FT*FT/SEC.) =   0.63
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1351.00 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1351.00 TO NODE   1350.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1272.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.97
  PIPE TRAVEL TIME(MIN.) =   0.77    Tc(MIN.) =    9.89
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1350.40 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1350.40 TO NODE   1350.40 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.89
  RAINFALL INTENSITY(INCH/HR) =   5.94
  TOTAL STREAM AREA(ACRES) =     0.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.97

****************************************************************************
  FLOW PROCESS FROM NODE   1350.80 TO NODE   1350.60 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1278.00
  DOWNSTREAM ELEVATION(FEET) =   1276.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.38

********************************************************************************
  FLOW PROCESS FROM NODE   1350.60 TO NODE   1350.40 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1276.00  DOWNSTREAM ELEVATION(FEET) = 1267.00
  STREET LENGTH(FEET) =   160.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.44
  STREET FLOW TRAVEL TIME(MIN.) =   0.55   Tc(MIN.) =    7.54
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.072
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    7.36
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       7.72
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.16
  FLOW VELOCITY(FEET/SEC.) =  5.66   DEPTH*VELOCITY(FT*FT/SEC.) =   1.98
  LONGEST FLOWPATH FROM NODE   1350.80 TO NODE   1350.40 =     240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1350.40 TO NODE   1350.40 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.54
  RAINFALL INTENSITY(INCH/HR) =   7.07
  TOTAL STREAM AREA(ACRES) =     2.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.97     9.89        5.940          0.93
      2        7.72     7.54        7.072          2.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.98     7.54       7.072
      2        9.45     9.89       5.940

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.98   Tc(MIN.) =    7.54
  TOTAL AREA(ACRES) =        3.0
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1350.40 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1350.40 TO NODE   1346.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1267.00  DOWNSTREAM(FEET) =  1265.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.5 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.54
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.98
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    7.64
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1346.00 =     690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1346.00 TO NODE   1330.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1265.00  DOWNSTREAM(FEET) =  1255.00
  FLOW LENGTH(FEET) =   850.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.94
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.98
  PIPE TRAVEL TIME(MIN.) =   2.04    Tc(MIN.) =    9.68
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1330.00 =    1540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1330.00 TO NODE   1330.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        9.98     9.68       6.022        3.03
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1330.00 =    1540.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       12.74     8.35       6.625        3.33
  LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1330.00 =     813.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      21.35       8.35        6.625
      2      21.56       9.68        6.022

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.56   Tc(MIN.) =    9.68
  TOTAL AREA(ACRES) =        6.4
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1330.00 TO NODE   1330.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1330.00 TO NODE   1326.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1255.00  DOWNSTREAM(FEET) =   1120.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.3293
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2016 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      21.56
  FLOW VELOCITY(FEET/SEC) =   6.99 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.98   Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1326.00 =    1950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1330.00 TO NODE   1326.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.660
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4733
  SUBAREA AREA(ACRES) =    2.34   SUBAREA RUNOFF(CFS) =    3.97
  TOTAL AREA(ACRES) =        8.7   TOTAL RUNOFF(CFS) =      23.30
  TC(MIN.) =   10.66

****************************************************************************
  FLOW PROCESS FROM NODE   1326.00 TO NODE   1326.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.66
  RAINFALL INTENSITY(INCH/HR) =   5.66
  TOTAL STREAM AREA(ACRES) =     8.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.30
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1328.00 TO NODE   1327.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1325.00
  DOWNSTREAM ELEVATION(FEET) =   1315.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.605
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.567
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE   1327.00 TO NODE   1326.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1315.00  DOWNSTREAM(FEET) =   1120.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1075.00   CHANNEL SLOPE =  0.1814
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1507 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.72
  FLOW VELOCITY(FEET/SEC) =   2.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.24   Tc(MIN.) =   13.85
  LONGEST FLOWPATH FROM NODE   1328.00 TO NODE   1326.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1327.00 TO NODE   1326.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.780
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3017
  SUBAREA AREA(ACRES) =    6.90   SUBAREA RUNOFF(CFS) =    9.90
  TOTAL AREA(ACRES) =        7.1   TOTAL RUNOFF(CFS) =      10.30
  TC(MIN.) =   13.85
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1326.00 TO NODE   1326.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.85
  RAINFALL INTENSITY(INCH/HR) =   4.78
  TOTAL STREAM AREA(ACRES) =     7.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.30

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       23.30    10.66        5.660          8.70
      2       10.30    13.85        4.780          7.14

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       31.23    10.66       5.660
      2       29.98    13.85       4.780

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.23   Tc(MIN.) =   10.66
  TOTAL AREA(ACRES) =       15.8
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1326.00 =    1950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1326.00 TO NODE   1303.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1120.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   965.00   CHANNEL SLOPE =  0.2953
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1938 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      31.23
  FLOW VELOCITY(FEET/SEC) =   7.76 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =   12.73
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1303.00 =    2915.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1326.00 TO NODE   1303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.046
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3503
  SUBAREA AREA(ACRES) =    8.99   SUBAREA RUNOFF(CFS) =   12.25
  TOTAL AREA(ACRES) =       24.8   TOTAL RUNOFF(CFS) =      43.90
  TC(MIN.) =   12.73

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       43.90    12.73       5.046       24.83
  LONGEST FLOWPATH FROM NODE   1353.00 TO NODE   1303.00 =    2915.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       42.55    16.60       4.252       32.09
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1303.00 =    3365.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      76.53      12.73        5.046
      2      79.54      16.60        4.252

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      79.54   Tc(MIN.) =   16.60
  TOTAL AREA(ACRES) =       56.9

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       79.54    16.60       4.252       56.92
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1303.00 =    3365.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       30.85    16.59       4.255       31.13
  LONGEST FLOWPATH FROM NODE   2564.00 TO NODE   1303.00 =    2985.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     110.31      16.59        4.255
      2     110.37      16.60        4.252

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     110.37   Tc(MIN.) =   16.60
  TOTAL AREA(ACRES) =       88.1

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1302.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    775.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.1154
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1115 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     110.37
  FLOW VELOCITY(FEET/SEC) =   8.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   17.57
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1302.00 =    3885.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.100
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2943
  SUBAREA AREA(ACRES) =    9.18   SUBAREA RUNOFF(CFS) =   10.91
  TOTAL AREA(ACRES) =       97.2   TOTAL RUNOFF(CFS) =     117.32
  TC(MIN.) =   17.57

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1339.00 TO NODE   1338.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1284.00
  DOWNSTREAM ELEVATION(FEET) =   1282.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.362
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.185
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE   1338.00 TO NODE   1337.80 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1282.00  DOWNSTREAM ELEVATION(FEET) = 1276.00
  STREET LENGTH(FEET) =   165.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.66
  STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =    8.25
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.676
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.98      SUBAREA RUNOFF(CFS) =    3.34
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.54

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.31
  FLOW VELOCITY(FEET/SEC.) =  3.43   DEPTH*VELOCITY(FT*FT/SEC.) =   0.87
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1337.80 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1337.80 TO NODE   1337.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1270.00  DOWNSTREAM(FEET) =  1266.00
  FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.09
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.54
  PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =    8.95
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1337.60 =     505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1337.60 TO NODE   1337.60 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.95
  RAINFALL INTENSITY(INCH/HR) =   6.34
  TOTAL STREAM AREA(ACRES) =     1.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.54

****************************************************************************
  FLOW PROCESS FROM NODE   1345.00 TO NODE   1344.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1277.00
  DOWNSTREAM ELEVATION(FEET) =   1275.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE   1344.00 TO NODE   1343.80 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1275.00  DOWNSTREAM ELEVATION(FEET) = 1272.00
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
```

```
    HALFSTREET FLOOD WIDTH(FEET) =    7.71
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.66
  STREET FLOW TRAVEL TIME(MIN.) =   1.49   Tc(MIN.) =    8.49
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.553
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.518
  SUBAREA AREA(ACRES) =    0.69      SUBAREA RUNOFF(CFS) =    2.35
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       2.79

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.70
  FLOW VELOCITY(FEET/SEC.) =  2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   0.84
  LONGEST FLOWPATH FROM NODE   1345.00 TO NODE   1343.80 =     290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1343.80 TO NODE   1337.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1266.50  DOWNSTREAM(FEET) =  1266.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.83
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.79
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    8.66
  LONGEST FLOWPATH FROM NODE   1345.00 TO NODE   1337.60 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1337.60 TO NODE   1337.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.66
  RAINFALL INTENSITY(INCH/HR) =   6.47
  TOTAL STREAM AREA(ACRES) =     0.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.79

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.54     8.95        6.336          1.04
      2        2.79     8.66        6.468          0.82

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.21     8.66       6.468
      2        6.27     8.95       6.336

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.27   Tc(MIN.) =    8.95
  TOTAL AREA(ACRES) =        1.9
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1337.60 =     505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1337.60 TO NODE   1345.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1266.00  DOWNSTREAM(FEET) =  1264.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.27
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    9.24
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1345.60 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1345.60 TO NODE   1345.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.24
  RAINFALL INTENSITY(INCH/HR) =   6.21
  TOTAL STREAM AREA(ACRES) =     1.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.27

****************************************************************************
  FLOW PROCESS FROM NODE   1345.90 TO NODE   1345.80 IS CODE =  21
```

```
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1280.00
  DOWNSTREAM ELEVATION(FEET) =   1278.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.773
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.582
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.56

************************************************************************
  FLOW PROCESS FROM NODE   1345.80 TO NODE   1343.00 IS CODE =  62
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1278.00  DOWNSTREAM ELEVATION(FEET) = 1269.50
  STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
  STREET FLOW TRAVEL TIME(MIN.) =   1.55   Tc(MIN.) =    8.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.640
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5600
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.561
  SUBAREA AREA(ACRES) =    1.25      SUBAREA RUNOFF(CFS) =    4.65
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       5.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  10.97
  FLOW VELOCITY(FEET/SEC.) =  3.89   DEPTH*VELOCITY(FT*FT/SEC.) =   1.34
  LONGEST FLOWPATH FROM NODE   1345.90 TO NODE   1343.00 =     415.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1343.00 TO NODE   1345.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.50  DOWNSTREAM(FEET) =  1264.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.18
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.14
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.43
  LONGEST FLOWPATH FROM NODE   1345.90 TO NODE   1345.60 =     455.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1345.60 TO NODE   1345.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.43
  RAINFALL INTENSITY(INCH/HR) =   6.58
  TOTAL STREAM AREA(ACRES) =     1.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.14

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.27     9.24        6.205          1.86
      2        5.14     8.43        6.585          1.38

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.05     8.43       6.585
      2       11.11     9.24       6.205

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.11   Tc(MIN.) =    9.24
  TOTAL AREA(ACRES) =        3.2
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1345.60 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1345.60 TO NODE   1346.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1262.00
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.29
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.11
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    9.63
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1346.80 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1346.80 TO NODE   1346.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.63
  RAINFALL INTENSITY(INCH/HR) =   6.04
  TOTAL STREAM AREA(ACRES) =     3.24
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.11

****************************************************************************
  FLOW PROCESS FROM NODE   1348.00 TO NODE   1347.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1275.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1273.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   1347.00 TO NODE   1346.90 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1273.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   150.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.14
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
  STREET FLOW TRAVEL TIME(MIN.) =   0.67   Tc(MIN.) =    7.67
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.997
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.519
  SUBAREA AREA(ACRES) =    0.97      SUBAREA RUNOFF(CFS) =    3.53
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       3.89

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   5.98
  FLOW VELOCITY(FEET/SEC.) =  4.08   DEPTH*VELOCITY(FT*FT/SEC.) =   1.00
  LONGEST FLOWPATH FROM NODE   1348.00 TO NODE   1346.90 =     230.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1346.90 TO NODE   1346.80 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1262.50  DOWNSTREAM(FEET) =  1262.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.29
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.89
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.83
  LONGEST FLOWPATH FROM NODE   1348.00 TO NODE   1346.80 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1346.80 TO NODE   1346.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.83
  RAINFALL INTENSITY(INCH/HR) =   6.91
  TOTAL STREAM AREA(ACRES) =     1.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.89

****************************************************************************
  FLOW PROCESS FROM NODE   1347.60 TO NODE   1347.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1268.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.773
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.582
  SUBAREA RUNOFF(CFS) =      0.65
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.65

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1347.50 TO NODE   1347.40 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1268.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
 STREET LENGTH(FEET) =   110.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.96
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.32
   HALFSTREET FLOOD WIDTH(FEET) =    9.77
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.69
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.19
 STREET FLOW TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =    7.27
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.244
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.542
 SUBAREA AREA(ACRES) =    1.69      SUBAREA RUNOFF(CFS) =    6.61
 TOTAL AREA(ACRES) =        1.8        PEAK FLOW RATE(CFS) =       7.23

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.59
 FLOW VELOCITY(FEET/SEC.) =  4.24   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
 LONGEST FLOWPATH FROM NODE   1347.60 TO NODE   1347.40 =     210.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1347.40 TO NODE   1346.80 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1262.50  DOWNSTREAM(FEET) =  1262.00
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.71
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.23
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.37
  LONGEST FLOWPATH FROM NODE   1347.60 TO NODE   1346.80 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1346.80 TO NODE   1346.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.37
  RAINFALL INTENSITY(INCH/HR) =   7.18
  TOTAL STREAM AREA(ACRES) =     1.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.11     9.63        6.043          3.24
      2        3.89     7.83        6.906          1.07
      3        7.23     7.37        7.181          1.84

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       20.24     7.37       7.181
      2       20.56     7.83       6.906
      3       20.60     9.63       6.043

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.60   Tc(MIN.) =    9.63
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1346.80 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1346.80 TO NODE   1342.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1262.00  DOWNSTREAM(FEET) =  1261.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.78
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.60
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    9.74
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1342.00 =     850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1342.00 TO NODE   1342.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.74
  RAINFALL INTENSITY(INCH/HR) =   6.00
  TOTAL STREAM AREA(ACRES) =     6.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.60

****************************************************************************
  FLOW PROCESS FROM NODE   1347.90 TO NODE   1347.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1272.00
  DOWNSTREAM ELEVATION(FEET) =   1270.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.362
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.185
  SUBAREA RUNOFF(CFS) =      0.37
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
  FLOW PROCESS FROM NODE   1347.80 TO NODE   1347.70 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1270.00  DOWNSTREAM ELEVATION(FEET) = 1269.00
  STREET LENGTH(FEET) =   100.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.44
  STREET FLOW TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =    8.30
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.652
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.80      SUBAREA RUNOFF(CFS) =    2.71
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       3.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.04
  FLOW VELOCITY(FEET/SEC.) =  2.00   DEPTH*VELOCITY(FT*FT/SEC.) =   0.57
  LONGEST FLOWPATH FROM NODE   1347.90 TO NODE   1347.70 =     185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1347.70 TO NODE   1342.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1261.50
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.96
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.05
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    8.80
  LONGEST FLOWPATH FROM NODE   1347.90 TO NODE   1342.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1342.00 TO NODE   1342.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.80
  RAINFALL INTENSITY(INCH/HR) =   6.40
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.05

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.60     9.74        6.000          6.15
      2        3.05     8.80        6.403          0.90

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       22.35     8.80       6.403
      2       23.46     9.74       6.000

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.46   Tc(MIN.) =    9.74
  TOTAL AREA(ACRES) =        7.1
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1342.00 =     850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1342.00 TO NODE   1341.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1261.50  DOWNSTREAM(FEET) =  1260.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.21
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.46
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   10.04
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1341.50 =    1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1341.50 TO NODE   1341.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1260.00  DOWNSTREAM(FEET) =   1259.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =      23.46
  FLOW VELOCITY(FEET/SEC) =   3.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.27   Tc(MIN.) =   10.31
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1341.00 =    1050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1341.50 TO NODE   1341.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.783
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5186
  SUBAREA AREA(ACRES) =    0.51   SUBAREA RUNOFF(CFS) =    1.03
  TOTAL AREA(ACRES) =        7.6   TOTAL RUNOFF(CFS) =      23.46
  TC(MIN.) =   10.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE   1341.00 TO NODE   1340.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1253.00  DOWNSTREAM(FEET) =  1215.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.43
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.46
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   10.36
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1340.80 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1340.80 TO NODE   1340.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1215.00  DOWNSTREAM(FEET) =   1030.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   800.00   CHANNEL SLOPE =  0.2313
  SLOPE ADJUSTMENT CURVE USED:
```

```
  EFFECTIVE SLOPE = .1737 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      23.46
  FLOW VELOCITY(FEET/SEC) =   6.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.00   Tc(MIN.) =   12.36
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1340.00 =    1950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1340.80 TO NODE   1340.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.145
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4067
  SUBAREA AREA(ACRES) =    6.19   SUBAREA RUNOFF(CFS) =    8.60
  TOTAL AREA(ACRES) =       13.8   TOTAL RUNOFF(CFS) =      28.77
  TC(MIN.) =   12.36

****************************************************************************
  FLOW PROCESS FROM NODE   1340.00 TO NODE   1340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.36
  RAINFALL INTENSITY(INCH/HR) =   5.14
  TOTAL STREAM AREA(ACRES) =    13.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.77

****************************************************************************
  FLOW PROCESS FROM NODE   1356.10 TO NODE   1350.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1280.00
  DOWNSTREAM ELEVATION(FEET) =   1235.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.428
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      1.52
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.52

****************************************************************************
  FLOW PROCESS FROM NODE   1350.00 TO NODE   1340.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.00  DOWNSTREAM(FEET) =   1030.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.3417
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2038 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.52
  FLOW VELOCITY(FEET/SEC) =   2.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.44   Tc(MIN.) =    7.87
  LONGEST FLOWPATH FROM NODE   1356.10 TO NODE   1340.00 =     700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1350.00 TO NODE   1340.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.885
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2941
  SUBAREA AREA(ACRES) =    5.66   SUBAREA RUNOFF(CFS) =   10.91
  TOTAL AREA(ACRES) =        5.9   TOTAL RUNOFF(CFS) =      12.05
  TC(MIN.) =    7.87

****************************************************************************
  FLOW PROCESS FROM NODE   1340.00 TO NODE   1340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.87
  RAINFALL INTENSITY(INCH/HR) =   6.88
  TOTAL STREAM AREA(ACRES) =     5.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.05

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

```
    1       28.77    12.36        5.145         13.75
    2       12.05     7.87        6.885          5.95

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1       33.55     7.87       6.885
    2       37.77    12.36       5.145

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      37.77   Tc(MIN.) =   12.36
  TOTAL AREA(ACRES) =       19.7
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1340.00 =    1950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1340.00 TO NODE   1302.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    775.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1505.00   CHANNEL SLOPE =  0.1694
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1447 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      37.77
  FLOW VELOCITY(FEET/SEC) =   7.14 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.51   Tc(MIN.) =   15.87
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1302.00 =    3455.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1340.00 TO NODE   1302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.378
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3202
  SUBAREA AREA(ACRES) =   25.68   SUBAREA RUNOFF(CFS) =   31.48
  TOTAL AREA(ACRES) =       45.4   TOTAL RUNOFF(CFS) =      63.62
  TC(MIN.) =   15.87

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =  11
```

```
------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       63.62    15.87        4.378       45.38
  LONGEST FLOWPATH FROM NODE   1339.00 TO NODE   1302.00 =    3455.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1      117.32    17.57        4.100       97.23
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1302.00 =    3885.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     169.59      15.87        4.378
      2     176.90      17.57        4.100

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     176.90   Tc(MIN.) =   17.57
  TOTAL AREA(ACRES) =      142.6

************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =  12
------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
========================================================================

************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1301.00 IS CODE =  52
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    775.00  DOWNSTREAM(FEET) =    760.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   220.00   CHANNEL SLOPE =  0.0682
  CHANNEL FLOW THRU SUBAREA(CFS) =     176.90
  FLOW VELOCITY(FEET/SEC) =  14.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.25   Tc(MIN.) =   17.82
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE   1301.00 =    4105.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE     13.00 IS CODE =  41
------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   760.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =   665.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  23.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  36.23
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     176.90
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   18.12
  LONGEST FLOWPATH FROM NODE   1321.00 TO NODE     13.00 =    4770.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      142.6  TC(MIN.) =     18.12
  PEAK FLOW RATE(CFS)   =     176.90
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name: Newland Sierra

Job #: 2660-002

Run Name:
MERR15-P.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1510	1509	2	1530	1510	90	0.35	0.17				
1509	1508	5	1510	1345	500	0.35	2.10				
1508	1507	3	1345	1285	95						
1507	1506	5	1285	1135	575	0.25	5.42				
1506	1505	5	1135	910	950						
1506	1505	8				0.25	15.66				
1505	1504	3	910	865	320						
1504	1504	1						1 OF 2			
1505	1504	4	904	857	220			EX 36" CSP/RCP			
1504	1504	1						1 OF 2			
1504.3	1504.2	2	1225	1195	100	0.25	0.15				
1504.2	1504.1	5	1195	891	1070						
1504.2	1504.1	8				0.25	5.31				
1504.1	1504	4	891	857	574			EX 24" CSP/RCP			
1504	1504	1						2 OF 2			
1504	1500	4	857	846	234			EX 42" CSP			
1500	1500	1						1 of 2			
1503	1502	2	1310	1280	100	0.25	0.17				
1502	1501	5	1280	902	890						
1502	1501	8				0.25	7.08				
1501	1500	4	902	846	344			EX 24" CSP/RCP			
1500	1500	1						2 OF 2			
1500	15	4	846	791	162			EX 48" CSP			
							36.06				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2012 Advanced Engineering Software (aes)
              Ver. 19.0 Release Date: 06/01/2012  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                                6390 Greenwich Dr.
                                    Suite 170
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUBBASIN # 15                                                          *
* 2660-02 - AUGUST 2014                                                  *
 **************************************************************************

  FILE NAME: MERR15-P.DAT
  TIME/DATE OF STUDY: 14:59 08/19/2014
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1510.00 TO NODE   1509.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1510.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.945
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.247
 SUBAREA RUNOFF(CFS) =      0.49
 TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
 FLOW PROCESS FROM NODE   1509.00 TO NODE   1508.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1510.00  DOWNSTREAM(FEET) =   1345.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00   CHANNEL SLOPE =  0.3300
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.313
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
 AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   1.22
 Tc(MIN.) =    7.16
 SUBAREA AREA(ACRES) =     2.10       SUBAREA RUNOFF(CFS) =    4.91
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.322
 TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       5.35

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   8.53
 LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1508.00 =     590.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1508.00 TO NODE   1507.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1345.00  DOWNSTREAM(FEET) =  1285.00
 FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.53
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.35
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    7.22
 LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1507.00 =     685.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1507.00 TO NODE   1506.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1285.00  DOWNSTREAM(FEET) =   1135.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.2609
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.697
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.73
 AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   0.99
```

```
  Tc(MIN.) =    8.21
  SUBAREA AREA(ACRES) =     5.42       SUBAREA RUNOFF(CFS) =    9.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.271
  TOTAL AREA(ACRES) =        7.7         PEAK FLOW RATE(CFS) =      13.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1506.00 =    1260.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1506.00 TO NODE   1505.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    904.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   960.00   CHANNEL SLOPE =  0.2406
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      13.97
  FLOW VELOCITY(FEET/SEC) =   8.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.86   Tc(MIN.) =   10.07
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1505.00 =    2220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1506.00 TO NODE   1505.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.872
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2570
  SUBAREA AREA(ACRES) =   15.66   SUBAREA RUNOFF(CFS) =   22.99
  TOTAL AREA(ACRES) =       23.4   TOTAL RUNOFF(CFS) =      35.24
  TC(MIN.) =   10.07

****************************************************************************
  FLOW PROCESS FROM NODE   1505.00 TO NODE   1504.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   904.00  DOWNSTREAM(FEET) =   857.00
  FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.23
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.24
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   10.21
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1504.00 =    2440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1504.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.21
  RAINFALL INTENSITY(INCH/HR) =   5.82
  TOTAL STREAM AREA(ACRES) =    23.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     35.24
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1504.30 TO NODE   1504.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1225.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE   1504.20 TO NODE   1504.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    891.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.00   CHANNEL SLOPE =  0.2739
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1880 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.28
  FLOW VELOCITY(FEET/SEC) =   2.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.62   Tc(MIN.) =   14.72
  LONGEST FLOWPATH FROM NODE   1504.30 TO NODE   1504.10 =    1210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1504.20 TO NODE   1504.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.595
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    5.31   SUBAREA RUNOFF(CFS) =    6.10
  TOTAL AREA(ACRES) =      5.5   TOTAL RUNOFF(CFS) =      6.27
  TC(MIN.) =   14.72

****************************************************************************
  FLOW PROCESS FROM NODE   1504.10 TO NODE   1504.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   891.00  DOWNSTREAM(FEET) =   857.00
  FLOW LENGTH(FEET) =   574.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.13
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      6.27
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   15.67
  LONGEST FLOWPATH FROM NODE   1504.30 TO NODE   1504.00 =    1784.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1504.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.67
  RAINFALL INTENSITY(INCH/HR) =   4.41
  TOTAL STREAM AREA(ACRES) =     5.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.27

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       35.24    10.21        5.818         23.35
      2        6.27    15.67        4.415          5.46

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       39.33    10.21       5.818
      2       33.01    15.67       4.415

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      39.33   Tc(MIN.) =   10.21
  TOTAL AREA(ACRES) =       28.8
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1504.00 =    2440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1500.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   857.00  DOWNSTREAM(FEET) =   846.00
  FLOW LENGTH(FEET) =   234.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  12.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.55
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      39.33
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   10.45
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1500.00 =    2674.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1500.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.45
  RAINFALL INTENSITY(INCH/HR) =   5.73
  TOTAL STREAM AREA(ACRES) =    28.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     39.33

****************************************************************************
  FLOW PROCESS FROM NODE   1503.00 TO NODE   1502.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1290.00
  DOWNSTREAM ELEVATION(FEET) =   1260.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1260.00  DOWNSTREAM(FEET) =    902.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   820.00   CHANNEL SLOPE =  0.4366
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2184 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.44
  FLOW VELOCITY(FEET/SEC) =   2.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.22   Tc(MIN.) =   12.32
  LONGEST FLOWPATH FROM NODE   1503.00 TO NODE   1501.00 =     920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.153
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    7.10   SUBAREA RUNOFF(CFS) =    9.15
  TOTAL AREA(ACRES) =       7.3   TOTAL RUNOFF(CFS) =      9.46
  TC(MIN.) =   12.32

****************************************************************************
  FLOW PROCESS FROM NODE   1501.00 TO NODE   1500.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   902.00  DOWNSTREAM(FEET) =   846.00
  FLOW LENGTH(FEET) =   344.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.34
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.46
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   12.68
  LONGEST FLOWPATH FROM NODE   1503.00 TO NODE   1500.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1500.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.68
  RAINFALL INTENSITY(INCH/HR) =   5.06
  TOTAL STREAM AREA(ACRES) =     7.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       39.33    10.45        5.733         28.81
      2        9.46    12.68        5.061          7.34

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       47.12    10.45       5.733
      2       44.18    12.68       5.061

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.12   Tc(MIN.) =   10.45
  TOTAL AREA(ACRES) =       36.2
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE   1500.00 =    2674.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE     15.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   846.00  DOWNSTREAM(FEET) =   791.00
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.48
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      47.12
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   10.57
  LONGEST FLOWPATH FROM NODE   1510.00 TO NODE     15.00 =    2836.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       36.2  TC(MIN.) =     10.57
  PEAK FLOW RATE(CFS)   =      47.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name: Newland Sierra

Job #: 2660-02

Run Name:
P-16d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1607	1606	2	1344	1343.2	67	0.88	0.11				
1606	1605	6	1343.2	1310	625	0.88	0.95	1 side			
1605	1604	5	1310	1308	30			valley flow			
1604	1604	7	Tc=5.28 min	A=1.06 ac	Q=1.0 cfs						
1604	1603	3	1305	1280	75						
1603	1602	5	1280	1245	135						
1602	1602	1						1 of 2			
1610	1609	2	1590	1575	90	0.35	0.21				
1609	1608	5	1575	1315	550	0.3	5.42				
1608	1602	3	1315	1245	605						
1602	1602	1						2 of 2			
1602	1601	5	1245	950	1085	0.27	17.11				
1601	16	4	950	850	605			EX 42" CSP/RCP			
							23.80				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                    *
* BASIN 16 - WITH DETENTION                                             *
*                                                                       *
 *************************************************************************

  FILE NAME: P-16D.DAT
  TIME/DATE OF STUDY: 16:58 09/09/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1607.00 TO NODE   1606.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    67.00
  UPSTREAM ELEVATION(FEET) =   1344.00
  DOWNSTREAM ELEVATION(FEET) =   1343.20
  ELEVATION DIFFERENCE(FEET) =      0.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.055
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.89
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
  FLOW PROCESS FROM NODE   1606.00 TO NODE   1605.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1343.20  DOWNSTREAM ELEVATION(FEET) = 1310.00
  STREET LENGTH(FEET) =   625.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
  STREET FLOW TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =    5.17
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.028
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    0.95      SUBAREA RUNOFF(CFS) =    7.55
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       8.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.72
  FLOW VELOCITY(FEET/SEC.) =  5.65   DEPTH*VELOCITY(FT*FT/SEC.) =   2.04
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1605.00 =     692.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1605.00 TO NODE   1604.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1310.00  DOWNSTREAM(FEET) =   1308.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    30.00   CHANNEL SLOPE =  0.0667
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.42
  FLOW VELOCITY(FEET/SEC) =   6.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.08   Tc(MIN.) =    5.25
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1604.00 =     722.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1604.00 TO NODE   1604.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.28   RAIN INTENSITY(INCH/HOUR) =  8.90
  TOTAL AREA(ACRES) =     1.06   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE   1604.00 TO NODE   1603.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1305.00  DOWNSTREAM(FEET) =  1280.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   1.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.38
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.00
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    5.38
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1603.00 =     797.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1602.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =   1245.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2593
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.00
  FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.47   Tc(MIN.) =    5.86
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1602.00 =     932.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1602.00 TO NODE   1602.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.86
  RAINFALL INTENSITY(INCH/HR) =   8.33
  TOTAL STREAM AREA(ACRES) =     1.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE   1610.00 TO NODE   1609.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1590.00
  DOWNSTREAM ELEVATION(FEET) =   1575.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.945
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.247
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
  FLOW PROCESS FROM NODE   1609.00 TO NODE   1608.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1575.00  DOWNSTREAM(FEET) =   1315.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00   CHANNEL SLOPE =  0.4727
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.540
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.34
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   0.89
  Tc(MIN.) =    6.83
  SUBAREA AREA(ACRES) =     5.42       SUBAREA RUNOFF(CFS) =   12.26
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.302
  TOTAL AREA(ACRES) =        5.6          PEAK FLOW RATE(CFS) =      12.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =  12.89
  LONGEST FLOWPATH FROM NODE   1610.00 TO NODE   1608.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1608.00 TO NODE   1602.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1315.00  DOWNSTREAM(FEET) =  1245.00
  FLOW LENGTH(FEET) =   605.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.85
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.81
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =    7.40
  LONGEST FLOWPATH FROM NODE   1610.00 TO NODE   1602.00 =    1245.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1602.00 TO NODE   1602.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.40
  RAINFALL INTENSITY(INCH/HR) =   7.16
```

```
  TOTAL STREAM AREA(ACRES) =     5.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.81

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.00     5.86        8.329          1.06
      2       12.81     7.40        7.163          5.63

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.14     5.86       8.329
      2       13.67     7.40       7.163

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.67   Tc(MIN.) =    7.40
  TOTAL AREA(ACRES) =        6.7
  LONGEST FLOWPATH FROM NODE   1610.00 TO NODE   1602.00 =    1245.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1602.00 TO NODE   1601.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1245.00  DOWNSTREAM(FEET) =    945.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1085.00   CHANNEL SLOPE =  0.2765
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.449
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.82
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.31
  Tc(MIN.) =    8.71
  SUBAREA AREA(ACRES) =    17.11       SUBAREA RUNOFF(CFS) =   29.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.270
  TOTAL AREA(ACRES) =       23.8         PEAK FLOW RATE(CFS) =      41.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOW VELOCITY(FEET/SEC.) =  15.50
  LONGEST FLOWPATH FROM NODE   1610.00 TO NODE   1601.00 =    2330.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1601.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   850.00
  FLOW LENGTH(FEET) =   605.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  10.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.76
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.48
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    9.13
  LONGEST FLOWPATH FROM NODE   1610.00 TO NODE     16.00 =    2935.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       23.8  TC(MIN.) =      9.13
  PEAK FLOW RATE(CFS)   =      41.48
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name: Newland Sierra

Job #: 2660-02

Run Name:
P-19d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2025	2024	2	1295	1293	100	0.63	0.14				
2024	2023	5	1293	1275	930	0.63	9.04				
2023	2020	3	1269	1259	250						
2020	2020	1						1 of 2			
2022	2021	2	1284	1283	50	0.63	0.06				
2021	2020	6	1283	1265	315	0.63	0.39	2 sides			
2020	2020	1						2 of 2			
2020	2017	3	1259	1258	45						
2017	2017	1						1 of 2			
2019	2018	2	1310	1305	95	0.88	0.14				
2018	2017	6	1305	1270	590	0.89	0.95	1 side			
2017	2017	1						2 of 2			
2017	2014	3	1258	1179	855						
2014	2014	1						1 of 2			
2016	2015	2	1270	1264	70	0.9	0.17				
2015	2014	6	1264	1185	810	0.9	1.69				
2014	2014	1						2 of 2			
2014	1977	3	1185	1183	45						
1977	1977	10						save to bank 1			
1989	1988	2	1284	1283	75	0.63	0.09				
1988	1987	6	1283	1235	490	0.63	0.65				
1987	1983	3	1229	1214	165						
1983	1983	1						1 of 2			
1986	1985	2	1228	1226	80	0.59	0.10				
1985	1984	5	1226	1221	185	0.58	1.17				
1984	1983	3	1215	1214	75						
1983	1983	1						2 of 2			
1983	1979	3	1214	1194	335						
1979	1979	1						1 of 2			
1982	1981	2	1267	1264	90	0.63	0.14				
1981	1980	5	1264	1239	725	0.63	6.28				
1980	1979	3	1233	1195	100						
1979	1979	1						2 of 2			

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Job Name: Newland Sierra

Job #: 2660-02

Run Name:
P-19.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1979	1978	3	1195	1179	220						
1978	1978	1						1 of 2			
1978.4	1978.2	2	1235	1228	75	0.6	0.16				
1978.2	1978	6	1228	1185	610	0.59	1.15	2 sides			
1978	1978	1						2 of 2			
1978	1977	3	1179	1178	60						
1977	1977	11						add bank 1			
1977	1977	12						clear bank 1			
1977	1976	3	1178	1104	700						
1976	1976	1						1 of 2			
1976.4	1976.2	2	1186	1180	80	0.88	0.22				
1976.2	1976	6	1184	1115	780	0.89	1.36	1 side			
1976	1976	1						2 of 2			
1976	1975	3	1109	1070	625						
1975	1906.5	5	1070	1054	165	0.25	4.08				
1906.5	1906	3	1048	1047	25						
1906	1906	10						save to bank 1			
1968	1967	2	1320	1315	90	0.25	0.07				
1967	1964	5	1315	1270	730	0.27	0.74				
1964	1963	3	1264	1262	25						
1963	1963	1						1 of 2			
1974	1973	2	1310	1305	75	0.35	0.19				
1973	1972	5	1305	1270	580	0.27	2.32				
1972	1963	3	1264	1262	60						
1963	1963	1						2 of 2			
1963	1963.5	3	1262	1261.5	26						
1963.5	1963.5	10						save to bank 2			
1971	1970	2	1589	1558	100	0.35	0.44				
1970	1969	5	1558	1326	1020	0.27	7.17				
1969	1969	1						1 of 3			
1951	1950	2	1600	1529	100	0.35	0.14				
1950	1969	5	1529	1272	900	0.35	4.85				
1969	1969	1						2 of 3			
1958	1957	2	1435	1405	100	0.35	0.18				

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Job Name: Newland Sierra

Job #: 2660-02

Run Name:
P-19.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1957	1956	5	1405	1275	1125	0.35	4.29				
1956	1969	3	1269	1264	165						
1969	1969	1						3 of 3			
1969	1963.5	3	1264	1261.5	155						
1963.5	1963.5	11						add bank 2			
1963.5	193.5	12						clear bank 2			
1963.5	1959	3	1261.5	1179	829						
1959	1959	1						1 of 3			
1962	1961	2	1250	1240	65	0.63	0.03				
1961	1960	5	1240	1190	490	0.62	1.20				
1960	1959	3	1184	1179	25						
1959	1959	1						2 of 3			
1959.6	1959.4	2	1370	1326	100	0.35	0.21				
1959.4	1959.2	5	1326	1190	1185	0.35	2.83				
1959	1959	1						3 of 3			
1959	1924	3	1179	1176	65						
1924	1924	10						save to bank 2			
1993	1992	2	1276	1273	194	0.35	0.07				
1992	1933	5	1273	1267	255	0.35	0.31				
1933	1933	1						1 of 2			
1935	1934	2	1235	1234	70	0.33	0.18				
1934	1933	5	1234	1233	165	0.33	0.40				
1933	1933	1						3 of 3			
1933	1932	3	1227	1226	40						
1932	1925	3	1226	1194	490						
1925	1925	10						save to bank 3			
1931	1930	2	1280	1258	100	0.35	0.26				
1930	1929	5	1258	1214	200	0.31	3.39				
1929	1926	3	1208	1207	160						
1926	1926	1						1 of 2			
1928	1927	2	1223	1221	80	0.58	0.11				
1927	1926	5	1221	1216	260	0.58	1.90				
1926	1926	1						2 of 2			

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Run Name:
P-19.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1926	1925	3	1210	1196	195						
1925	1925	11						add bank 3			
1925	1925	12						clear bank 3			
1925	1924	3	1196	1178	285						
1924	1924	11						add bank 2			
1924	1924	12						clear bank 2			
1924	1912	3	1178	1087.4	690						
1912	1912	10						Save to bank 2			
1921.5	1921	2	1201	1200	65	0.25	0.05				
1921	1920	5	1200	1195	475	0.25	0.82	brow ditch			
1920	1917	3	1189	1183	25						
1917	1917	1						1 of 2			
1919	1918	2	1200	1198	80	0.58	0.11				
1918	1917	6	1198	1189	545	0.58	2.71				
1917	1917	1						2 of 2			
1917	1914	3	1189	1173	215						
1914	1914	1						1 of 2			
1916	1915	2	1193	1189	95	0.58	0.23				
1915	1914	6	1189	1179	780	0.58	3.23				
1914	1914	1						2 of 2			
1914	1913	3	1173	1089	130						
1913	1913	1						1 of 2			
1923	1922	2	1180	1168	90	0.25	0.06				
1922	1913	5	1168	1095	675	0.25	0.67				
1913	1913	1						2 of 2			
1913	1912	3	1089	1087.4	160						
1912	1912	11						Add bank 2			
1912	1912	12						Clear bank 2			
1912	1911	3	1087.4	1079	220						
1911	1911	1						1 of 2			
1911.4	1911.2	2	1150	1140	70	0.3	0.08				
1911.2	1911	5	1140	1085	250	0.25	0.53				
1911	1911	1						2 of 2			

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Job Name: Newland Sierra

Job #: 2660-02

Run Name:
P-19.dat

Node to Node		Code	Elev 1	Elev 2	Length	C	Area	Comments	BANK		
			(feet)	(feet)	(feet)	Factor	(ac.)		1	2	3
1911	1907	3	1079	1069.3	585						
1907	1907	1						1 of 2			
1910	1909	2	1090	1079.4	60	0.58	0.09				
1909	1908	5	1079.4	1075.8	360	0.61	6.00				
1908	1907	3	1070	1069.3	70						
1907	1907	1						2 of 2			
1907	1906	3	1069.3	1063.7	65						
1906	1906	11						add bank 1			
1906	1906	12						clear bank 1			
1906	1906	7	Q=50.0 Tc=11.39 A=73.9								
1906	1905	3	1063.7	1010	115						
1905	1901	5	1010	950	815	0.32	21.06				
1901	1901	7	Q=74.0 Tc=12.66 A=95.0								
1901	19	4	950	930	441			EX 60" RCP CALTRANS SD			
							94.90				

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* PROPOSED HYDROLOGY                                                     *
* SUB BASIN 19 WITH DETENTION                                            *
*                                                                        *
 ************************************************************************

  FILE NAME: P-19D.DAT
  TIME/DATE OF STUDY: 15:25 01/20/2016
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE   2025.00 TO NODE   2024.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1295.00
  DOWNSTREAM ELEVATION(FEET) =   1293.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.006
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.193
SUBAREA RUNOFF(CFS) =      0.72
TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
 FLOW PROCESS FROM NODE   2024.00 TO NODE   2023.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1293.00  DOWNSTREAM(FEET) =   1275.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.0194
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.206
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6300
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.80
 AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   3.23
 Tc(MIN.) =    9.24
 SUBAREA AREA(ACRES) =     9.04       SUBAREA RUNOFF(CFS) =   35.35
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      35.89

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   5.73
 LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2023.00 =    1030.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2023.00 TO NODE   2020.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1269.00  DOWNSTREAM(FEET) =  1259.00
 FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.30
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      35.89
 PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    9.51
 LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2020.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2020.00 TO NODE   2020.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.51
 RAINFALL INTENSITY(INCH/HR) =   6.09
 TOTAL STREAM AREA(ACRES) =     9.18
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     35.89

****************************************************************************
 FLOW PROCESS FROM NODE   2022.00 TO NODE   2021.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1284.00
  DOWNSTREAM ELEVATION(FEET) =   1283.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.748
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.35

********************************************************************************
  FLOW PROCESS FROM NODE   2021.00 TO NODE   2020.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1283.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.17
    HALFSTREET FLOOD WIDTH(FEET) =    2.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.68
  STREET FLOW TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =    6.07
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.136
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    2.00
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       2.31

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.26
  FLOW VELOCITY(FEET/SEC.) =  3.85   DEPTH*VELOCITY(FT*FT/SEC.) =   0.81
  LONGEST FLOWPATH FROM NODE   2022.00 TO NODE   2020.00 =     365.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   2020.00 TO NODE   2020.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.07
```

```
 RAINFALL INTENSITY(INCH/HR) =   8.14
 TOTAL STREAM AREA(ACRES) =     0.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.31

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1       35.89     9.51        6.091          9.18
    2        2.31     6.07        8.136          0.45

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1       25.22     6.07        8.136
    2       37.62     9.51        6.091

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      37.62   Tc(MIN.) =    9.51
 TOTAL AREA(ACRES) =        9.6
 LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2020.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2020.00 TO NODE   2017.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1259.00  DOWNSTREAM(FEET) =  1258.00
 FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.39
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      37.62
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.57
 LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2017.00 =    1325.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2017.00 TO NODE   2017.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.57
 RAINFALL INTENSITY(INCH/HR) =   6.07
 TOTAL STREAM AREA(ACRES) =     9.63
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.62

****************************************************************************
 FLOW PROCESS FROM NODE   2019.00 TO NODE   2018.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .8800
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =   1310.00
 DOWNSTREAM ELEVATION(FEET) =   1305.00
 ELEVATION DIFFERENCE(FEET) =      5.00
```

```
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.219
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.14
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      1.14

****************************************************************************
 FLOW PROCESS FROM NODE   2018.00 TO NODE   2017.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1305.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
 STREET LENGTH(FEET) =   590.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.03
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.31
   HALFSTREET FLOOD WIDTH(FEET) =    9.17
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.63
 STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =    4.09
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .8900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.889
 SUBAREA AREA(ACRES) =    0.95      SUBAREA RUNOFF(CFS) =    7.80
 TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       8.93

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.72
 FLOW VELOCITY(FEET/SEC.) =  5.99   DEPTH*VELOCITY(FT*FT/SEC.) =   2.16
 LONGEST FLOWPATH FROM NODE   2019.00 TO NODE   2017.00 =     685.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2017.00 TO NODE   2017.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    4.09
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     1.09
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.93

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       37.62     9.57        6.066          9.63
```

```
     2        8.93     4.09        9.222          1.09

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       33.68     4.09       9.222
      2       43.50     9.57       6.066

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      43.50   Tc(MIN.) =    9.57
  TOTAL AREA(ACRES) =       10.7
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2017.00 =    1325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2017.00 TO NODE   2014.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1258.00  DOWNSTREAM(FEET) =  1179.00
  FLOW LENGTH(FEET) =   855.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.62
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.50
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   10.23
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2014.00 =    2180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2014.00 TO NODE   2014.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.23
  RAINFALL INTENSITY(INCH/HR) =   5.81
  TOTAL STREAM AREA(ACRES) =    10.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     43.50

****************************************************************************
  FLOW PROCESS FROM NODE   2016.00 TO NODE   2015.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1264.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.472
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.41
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.41

****************************************************************************
  FLOW PROCESS FROM NODE   2015.00 TO NODE   2014.00 IS CODE =  62
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1264.00  DOWNSTREAM ELEVATION(FEET) = 1185.00
  STREET LENGTH(FEET) =   810.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.42
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.36
  STREET FLOW TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =    3.38
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.69      SUBAREA RUNOFF(CFS) =   14.03
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =      15.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.28
  FLOW VELOCITY(FEET/SEC.) =  8.20   DEPTH*VELOCITY(FT*FT/SEC.) =   3.21
  LONGEST FLOWPATH FROM NODE   2016.00 TO NODE   2014.00 =     880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2014.00 TO NODE   2014.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.38
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.44

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       43.50    10.23        5.811         10.72
      2       15.44     3.38        9.222          1.86

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
```

```
     1       42.85     3.38       9.222
     2       53.23    10.23       5.811

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      53.23   Tc(MIN.) =   10.23
  TOTAL AREA(ACRES) =       12.6
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   2014.00 =    2180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2014.00 TO NODE   1977.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1185.00  DOWNSTREAM(FEET) =  1183.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.52
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      53.23
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   10.27
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1977.00 =    2225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1977.00 TO NODE   1977.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1989.00 TO NODE   1988.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1284.00
  DOWNSTREAM ELEVATION(FEET) =   1283.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.431
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    70.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.840
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE   1988.00 TO NODE   1987.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1283.00  DOWNSTREAM ELEVATION(FEET) = 1235.00
  STREET LENGTH(FEET) =   490.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.18
    HALFSTREET FLOOD WIDTH(FEET) =    2.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.90
  STREET FLOW TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =    8.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.797
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    2.78
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       3.17

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.39
  FLOW VELOCITY(FEET/SEC.) =  5.10   DEPTH*VELOCITY(FT*FT/SEC.) =   1.09
  LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1987.00 =     565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1987.00 TO NODE   1983.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1229.00  DOWNSTREAM(FEET) =  1214.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.17
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    8.27
  LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1983.00 =     730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1983.00 TO NODE   1983.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.27
  RAINFALL INTENSITY(INCH/HR) =   6.66
  TOTAL STREAM AREA(ACRES) =     0.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.17

****************************************************************************
  FLOW PROCESS FROM NODE   1986.00 TO NODE   1985.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
```

```
  UPSTREAM ELEVATION(FEET) =   1228.00
  DOWNSTREAM ELEVATION(FEET) =   1226.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.050
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.155
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE   1985.00 TO NODE   1984.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1226.00  DOWNSTREAM(FEET) =   1221.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   185.00   CHANNEL SLOPE =  0.0270
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.377
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5800
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.03
  AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   1.02
  Tc(MIN.) =    7.07
  SUBAREA AREA(ACRES) =     1.17       SUBAREA RUNOFF(CFS) =    5.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.581
  TOTAL AREA(ACRES) =        1.3         PEAK FLOW RATE(CFS) =       5.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   3.73
  LONGEST FLOWPATH FROM NODE   1986.00 TO NODE   1984.00 =     265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1984.00 TO NODE   1983.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1215.00  DOWNSTREAM(FEET) =  1214.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.42
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.44
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    7.26
  LONGEST FLOWPATH FROM NODE   1986.00 TO NODE   1983.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1983.00 TO NODE   1983.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.26
  RAINFALL INTENSITY(INCH/HR) =   7.25
  TOTAL STREAM AREA(ACRES) =     1.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.44
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.17     8.27        6.664          0.74
      2        5.44     7.26        7.249          1.27

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.22     7.26        7.249
      2        8.17     8.27        6.664

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.22   Tc(MIN.) =    7.26
  TOTAL AREA(ACRES) =        2.0
  LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1983.00 =     730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1983.00 TO NODE   1979.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1214.00  DOWNSTREAM(FEET) =  1194.00
  FLOW LENGTH(FEET) =   335.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.44
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.22
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    7.71
  LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1979.00 =    1065.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1979.00 TO NODE   1979.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.71
  RAINFALL INTENSITY(INCH/HR) =   6.97
  TOTAL STREAM AREA(ACRES) =     2.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.22

****************************************************************************
  FLOW PROCESS FROM NODE   1982.00 TO NODE   1981.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1267.00
  DOWNSTREAM ELEVATION(FEET) =   1264.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.373
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.803
  SUBAREA RUNOFF(CFS) =      0.78
```

```
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
 FLOW PROCESS FROM NODE   1981.00 TO NODE   1980.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1264.00  DOWNSTREAM(FEET) =   1239.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   725.00   CHANNEL SLOPE =  0.0345
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.052
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6300
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
 AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   2.21
 Tc(MIN.) =    7.58
 SUBAREA AREA(ACRES) =     6.28       SUBAREA RUNOFF(CFS) =   27.90
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 TOTAL AREA(ACRES) =        6.4         PEAK FLOW RATE(CFS) =      28.52

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   6.63
 LONGEST FLOWPATH FROM NODE   1982.00 TO NODE   1980.00 =     815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1980.00 TO NODE   1979.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1233.00  DOWNSTREAM(FEET) =  1195.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  34.11
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      28.52
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    7.63
 LONGEST FLOWPATH FROM NODE   1982.00 TO NODE   1979.00 =     915.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1979.00 TO NODE   1979.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.63
 RAINFALL INTENSITY(INCH/HR) =   7.02
 TOTAL STREAM AREA(ACRES) =     6.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.52

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        8.22     7.71        6.974          2.01
     2       28.52     7.63        7.023          6.42
```

```
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       36.69     7.63       7.023
     2       36.55     7.71       6.974

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      36.69   Tc(MIN.) =    7.63
 TOTAL AREA(ACRES) =        8.4
 LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1979.00 =    1065.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1979.00 TO NODE   1978.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1195.00  DOWNSTREAM(FEET) =  1179.00
 FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.09
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      36.69
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    7.82
 LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1978.00 =    1285.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1978.00 TO NODE   1978.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.82
 RAINFALL INTENSITY(INCH/HR) =   6.91
 TOTAL STREAM AREA(ACRES) =     8.43
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.69

****************************************************************************
 FLOW PROCESS FROM NODE   1978.40 TO NODE   1978.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
 UPSTREAM ELEVATION(FEET) =   1235.00
 DOWNSTREAM ELEVATION(FEET) =   1228.00
 ELEVATION DIFFERENCE(FEET) =      7.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.702
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.89
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
 FLOW PROCESS FROM NODE   1978.20 TO NODE   1978.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1228.00  DOWNSTREAM ELEVATION(FEET) = 1185.00
  STREET LENGTH(FEET) =   610.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.70
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.38
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
  STREET FLOW TRAVEL TIME(MIN.) =   2.24   Tc(MIN.) =    5.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.248
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.591
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    5.60
  TOTAL AREA(ACRES) =        1.3        PEAK FLOW RATE(CFS) =       6.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.18
  FLOW VELOCITY(FEET/SEC.) =  5.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.36
  LONGEST FLOWPATH FROM NODE   1978.40 TO NODE   1978.00 =     685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1978.00 TO NODE   1978.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.94
  RAINFALL INTENSITY(INCH/HR) =   8.25
  TOTAL STREAM AREA(ACRES) =     1.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       36.69     7.82        6.911          8.43
      2        6.39     5.94        8.248          1.31

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       37.13     5.94       8.248
      2       42.04     7.82       6.911
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      42.04   Tc(MIN.) =    7.82
 TOTAL AREA(ACRES) =        9.7
 LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1978.00 =    1285.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1978.00 TO NODE   1977.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1179.00  DOWNSTREAM(FEET) =  1178.00
 FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.46
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      42.04
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    7.91
 LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1977.00 =    1345.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1977.00 TO NODE   1977.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       42.04     7.91        6.862        9.74
 LONGEST FLOWPATH FROM NODE   1989.00 TO NODE   1977.00 =    1345.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       53.23    10.27        5.796       12.58
 LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1977.00 =    2225.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      83.01       7.91        6.862
    2      88.73      10.27        5.796

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      88.73   Tc(MIN.) =   10.27
 TOTAL AREA(ACRES) =       22.3

****************************************************************************
 FLOW PROCESS FROM NODE   1977.00 TO NODE   1977.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1977.00 TO NODE   1976.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1178.00  DOWNSTREAM(FEET) =  1104.00
 FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.6 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.29
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      88.73
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   10.70
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1976.00 =    2925.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1976.00 TO NODE   1976.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.70
  RAINFALL INTENSITY(INCH/HR) =   5.65
  TOTAL STREAM AREA(ACRES) =    22.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     88.73

****************************************************************************
  FLOW PROCESS FROM NODE   1976.40 TO NODE   1976.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1186.00
  DOWNSTREAM ELEVATION(FEET) =   1180.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.810
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.79
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.79

****************************************************************************
  FLOW PROCESS FROM NODE   1976.20 TO NODE   1976.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1184.00  DOWNSTREAM ELEVATION(FEET) = 1115.00
  STREET LENGTH(FEET) =   780.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =    9.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.16
  STREET FLOW TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =    3.77
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
```

```
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.889
  SUBAREA AREA(ACRES) =    1.36      SUBAREA RUNOFF(CFS) =   11.16
  TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =      12.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.59
  FLOW VELOCITY(FEET/SEC.) =  7.60   DEPTH*VELOCITY(FT*FT/SEC.) =   2.87
  LONGEST FLOWPATH FROM NODE   1976.40 TO NODE   1976.00 =     860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1976.00 TO NODE   1976.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.77
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.95

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc       INTENSITY      AREA
  NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1       88.73    10.70        5.645         22.32
      2       12.95     3.77        9.222          1.58

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       44.22     3.77        9.222
      2       96.66    10.70        5.645

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      96.66   Tc(MIN.) =   10.70
  TOTAL AREA(ACRES) =       23.9
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1976.00 =    2925.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1976.00 TO NODE   1975.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1109.00  DOWNSTREAM(FEET) =  1070.00
  FLOW LENGTH(FEET) =   625.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.57
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      96.66
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   11.16
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1975.00 =    3550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1975.00 TO NODE   1906.50 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =   1054.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   165.00   CHANNEL SLOPE =  0.0970
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.430
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.63
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   0.20
  Tc(MIN.) =   11.36
  SUBAREA AREA(ACRES) =     4.08       SUBAREA RUNOFF(CFS) =    5.54
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.613
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      96.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =  13.51
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1906.50 =    3715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1906.50 TO NODE   1906.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1048.00  DOWNSTREAM(FEET) =  1047.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.24
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      96.66
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   11.39
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1906.00 =    3740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1906.00 TO NODE   1906.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1968.00 TO NODE   1967.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1320.00
  DOWNSTREAM ELEVATION(FEET) =   1315.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.196
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.705
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1967.00 TO NODE   1964.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1315.00  DOWNSTREAM(FEET) =   1270.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   730.00   CHANNEL SLOPE =  0.0616
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.817
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.61
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.22
 AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   5.49
 Tc(MIN.) =   13.68
 SUBAREA AREA(ACRES) =     0.74       SUBAREA RUNOFF(CFS) =    0.96
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.268
 TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       1.05

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   2.76
 LONGEST FLOWPATH FROM NODE   1968.00 TO NODE   1964.00 =     820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1964.00 TO NODE   1963.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1262.00
 FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.60
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.05
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   13.74
 LONGEST FLOWPATH FROM NODE   1968.00 TO NODE   1963.00 =     845.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1963.00 TO NODE   1963.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.74
 RAINFALL INTENSITY(INCH/HR) =   4.81
 TOTAL STREAM AREA(ACRES) =     0.81
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.05

****************************************************************************
 FLOW PROCESS FROM NODE   1974.00 TO NODE   1973.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
 UPSTREAM ELEVATION(FEET) =   1310.00
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```
 DOWNSTREAM ELEVATION(FEET) =   1305.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.212
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.017
 SUBAREA RUNOFF(CFS) =      0.53
 TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
 FLOW PROCESS FROM NODE   1973.00 TO NODE   1972.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =   1270.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   580.00   CHANNEL SLOPE =  0.0603
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.421
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.79
 AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   2.55
 Tc(MIN.) =    8.76
 SUBAREA AREA(ACRES) =     2.32       SUBAREA RUNOFF(CFS) =    4.02
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.276
 TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       4.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.27   FLOW VELOCITY(FEET/SEC.) =   4.62
 LONGEST FLOWPATH FROM NODE   1974.00 TO NODE   1972.00 =     655.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1972.00 TO NODE   1963.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1262.00
 FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.51
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.45
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    8.88
 LONGEST FLOWPATH FROM NODE   1974.00 TO NODE   1963.00 =     715.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1963.00 TO NODE   1963.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.88
 RAINFALL INTENSITY(INCH/HR) =   6.37
 TOTAL STREAM AREA(ACRES) =     2.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.45

 ** CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.05    13.74        4.805          0.81
      2        4.45     8.88        6.366          2.51

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1        5.13     8.88        6.366
      2        4.41    13.74        4.805

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.13   Tc(MIN.) =    8.88
  TOTAL AREA(ACRES) =        3.3
  LONGEST FLOWPATH FROM NODE   1968.00 TO NODE   1963.00 =     845.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1963.00 TO NODE   1963.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1262.00  DOWNSTREAM(FEET) =  1261.50
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.24
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.13
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    8.94
  LONGEST FLOWPATH FROM NODE   1968.00 TO NODE   1963.50 =     871.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1963.50 TO NODE   1963.50 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1971.00 TO NODE   1970.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1589.00
  DOWNSTREAM ELEVATION(FEET) =   1558.00
  ELEVATION DIFFERENCE(FEET) =     31.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      1.23
  TOTAL AREA(ACRES) =      0.44   TOTAL RUNOFF(CFS) =      1.23

****************************************************************************
  FLOW PROCESS FROM NODE   1970.00 TO NODE   1969.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1558.00  DOWNSTREAM(FEET) =   1326.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1020.00   CHANNEL SLOPE =  0.2275
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.688
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.67
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =    8.23
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =   12.95
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.275
  TOTAL AREA(ACRES) =        7.6         PEAK FLOW RATE(CFS) =      13.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =  10.39
  LONGEST FLOWPATH FROM NODE   1971.00 TO NODE   1969.00 =    1120.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1969.00 TO NODE   1969.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.23
  RAINFALL INTENSITY(INCH/HR) =   6.69
  TOTAL STREAM AREA(ACRES) =     7.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.98

****************************************************************************
  FLOW PROCESS FROM NODE   1951.00 TO NODE   1950.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1600.00
  DOWNSTREAM ELEVATION(FEET) =   1529.00
  ELEVATION DIFFERENCE(FEET) =     71.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE   1950.00 TO NODE   1969.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1529.00  DOWNSTREAM(FEET) =   1272.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00   CHANNEL SLOPE =  0.2856
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.803
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.59
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =    8.01
  SUBAREA AREA(ACRES) =     4.85       SUBAREA RUNOFF(CFS) =   11.55
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        5.0         PEAK FLOW RATE(CFS) =      11.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =  10.67
  LONGEST FLOWPATH FROM NODE   1951.00 TO NODE   1969.00 =    1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1969.00 TO NODE   1969.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.01
  RAINFALL INTENSITY(INCH/HR) =   6.80
  TOTAL STREAM AREA(ACRES) =     4.99
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.88

****************************************************************************
  FLOW PROCESS FROM NODE   1958.00 TO NODE   1957.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1435.00
  DOWNSTREAM ELEVATION(FEET) =   1405.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   1957.00 TO NODE   1956.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1405.00  DOWNSTREAM(FEET) =   1275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1125.00   CHANNEL SLOPE =  0.1156
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.139
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.99
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   3.13
  Tc(MIN.) =    9.40
```

```
  SUBAREA AREA(ACRES) =     4.29       SUBAREA RUNOFF(CFS) =    9.22
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =       9.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   7.32
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1956.00 =    1225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1956.00 TO NODE   1969.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1269.00  DOWNSTREAM(FEET) =  1264.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.60
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    9.67
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1969.00 =    1390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1969.00 TO NODE   1969.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.67
  RAINFALL INTENSITY(INCH/HR) =   6.03
  TOTAL STREAM AREA(ACRES) =     4.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.98     8.23        6.688          7.61
      2       11.88     8.01        6.803          4.99
      3        9.60     9.67        6.027          4.47

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       33.45     8.01       6.803
      2       33.83     8.23       6.688
      3       32.72     9.67       6.027

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.83   Tc(MIN.) =    8.23
  TOTAL AREA(ACRES) =       17.1
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1969.00 =    1390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1969.00 TO NODE   1963.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1261.50
  FLOW LENGTH(FEET) =   155.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.63
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.83
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    8.47
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1963.50 =    1545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1963.50 TO NODE   1963.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       33.83     8.47       6.563       17.07
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1963.50 =    1545.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.13     8.94       6.339        3.32
  LONGEST FLOWPATH FROM NODE   1968.00 TO NODE   1963.50 =     871.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      38.69       8.47        6.563
      2      37.80       8.94        6.339

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      38.69   Tc(MIN.) =    8.47
  TOTAL AREA(ACRES) =       20.4

****************************************************************************
  FLOW PROCESS FROM NODE   1963.50 TO NODE   1963.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1963.00 TO NODE   1959.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1261.50  DOWNSTREAM(FEET) =  1179.00
  FLOW LENGTH(FEET) =   829.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.98
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.69
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    9.10
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1959.00 =    2374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1959.00 TO NODE   1959.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.10
  RAINFALL INTENSITY(INCH/HR) =   6.27
  TOTAL STREAM AREA(ACRES) =    20.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.69

****************************************************************************
  FLOW PROCESS FROM NODE   1962.00 TO NODE   1961.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1250.00
  DOWNSTREAM ELEVATION(FEET) =   1240.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.166
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE   1961.00 TO NODE   1960.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1240.00  DOWNSTREAM(FEET) =   1190.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   490.00   CHANNEL SLOPE =  0.1020
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.05
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =    4.78
  SUBAREA AREA(ACRES) =     1.20       SUBAREA RUNOFF(CFS) =    6.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.620
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       7.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   6.32
  LONGEST FLOWPATH FROM NODE   1962.00 TO NODE   1960.00 =     555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1960.00 TO NODE   1959.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1184.00  DOWNSTREAM(FEET) =  1179.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
```

```
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.41
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.04
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    4.81
 LONGEST FLOWPATH FROM NODE   1962.00 TO NODE   1959.00 =     580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1959.00 TO NODE   1959.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    4.81
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     1.23
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.04

****************************************************************************
 FLOW PROCESS FROM NODE   1959.60 TO NODE   1959.40 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1370.00
 DOWNSTREAM ELEVATION(FEET) =   1326.00
 ELEVATION DIFFERENCE(FEET) =     44.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.59
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
 FLOW PROCESS FROM NODE   1959.40 TO NODE   1959.20 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1326.00  DOWNSTREAM(FEET) =   1190.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1185.00   CHANNEL SLOPE =  0.1148
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.869
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.19
 AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   3.81
 Tc(MIN.) =   10.07
 SUBAREA AREA(ACRES) =     2.83       SUBAREA RUNOFF(CFS) =    5.81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        3.0         PEAK FLOW RATE(CFS) =       6.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   6.33
 LONGEST FLOWPATH FROM NODE   1959.60 TO NODE   1959.20 =    1285.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1959.00 TO NODE   1959.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.07
  RAINFALL INTENSITY(INCH/HR) =   5.87
  TOTAL STREAM AREA(ACRES) =     3.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.24

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       38.69     9.10        6.267         20.39
      2        7.04     4.81        9.222          1.23
      3        6.24    10.07        5.869          3.04

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       30.45     4.81        9.222
      2       49.11     9.10        6.267
      3       46.95    10.07        5.869

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.11   Tc(MIN.) =    9.10
  TOTAL AREA(ACRES) =       24.7
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1959.00 =    2374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1959.00 TO NODE   1924.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1179.00  DOWNSTREAM(FEET) =  1176.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.55
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.11
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.16
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1924.00 =    2439.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1924.00 TO NODE   1924.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1993.00 TO NODE   1992.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   194.00
  UPSTREAM ELEVATION(FEET) =   1276.00
  DOWNSTREAM ELEVATION(FEET) =   1273.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.988
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    73.20
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.902
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.14

****************************************************************************
  FLOW PROCESS FROM NODE   1992.00 TO NODE   1933.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1273.00  DOWNSTREAM(FEET) =   1267.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   255.00   CHANNEL SLOPE =  0.0235
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.015
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.48
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   12.86
  SUBAREA AREA(ACRES) =     0.31       SUBAREA RUNOFF(CFS) =    0.54
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.73
  LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1933.00 =     449.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1933.00 TO NODE   1933.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.86
  RAINFALL INTENSITY(INCH/HR) =   5.01
  TOTAL STREAM AREA(ACRES) =     0.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.67

****************************************************************************
  FLOW PROCESS FROM NODE   1935.00 TO NODE   1934.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1235.00
```

```
 DOWNSTREAM ELEVATION(FEET) =   1234.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.296
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.787
 SUBAREA RUNOFF(CFS) =      0.34
 TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
 FLOW PROCESS FROM NODE   1934.00 TO NODE   1933.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1234.00  DOWNSTREAM(FEET) =   1233.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   165.00   CHANNEL SLOPE =  0.0061
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.048
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3300
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.13
 AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   2.43
 Tc(MIN.) =   12.73
 SUBAREA AREA(ACRES) =     0.40       SUBAREA RUNOFF(CFS) =    0.67
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.330
 TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       0.97

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   1.29
 LONGEST FLOWPATH FROM NODE   1935.00 TO NODE   1933.00 =     235.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1933.00 TO NODE   1933.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.73
 RAINFALL INTENSITY(INCH/HR) =   5.05
 TOTAL STREAM AREA(ACRES) =     0.58
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.97

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.67    12.86        5.015          0.38
     2        0.97    12.73        5.048          0.58

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        1.63    12.73       5.048
     2        1.63    12.86       5.015

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.63   Tc(MIN.) =   12.86
```

```
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1933.00 =     449.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1933.00 TO NODE   1932.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1227.00  DOWNSTREAM(FEET) =  1226.00
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.76
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.63
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   12.97
 LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1932.00 =     489.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1932.00 TO NODE   1925.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1226.00  DOWNSTREAM(FEET) =  1194.00
 FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.07
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.63
 PIPE TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =   13.98
 LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1925.00 =     979.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1925.00 TO NODE   1925.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1931.00 TO NODE   1930.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1280.00
 DOWNSTREAM ELEVATION(FEET) =   1258.00
 ELEVATION DIFFERENCE(FEET) =     22.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.73
 TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
 FLOW PROCESS FROM NODE   1930.00 TO NODE   1929.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.00  DOWNSTREAM(FEET) =   1214.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   200.00   CHANNEL SLOPE =  0.2200
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.611
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3100
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.14
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   0.47
  Tc(MIN.) =    6.73
  SUBAREA AREA(ACRES) =     3.39       SUBAREA RUNOFF(CFS) =    8.00
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.313
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       8.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE   1931.00 TO NODE   1929.00 =     300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1929.00 TO NODE   1926.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1208.00  DOWNSTREAM(FEET) =  1207.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.39
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.69
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =    7.23
  LONGEST FLOWPATH FROM NODE   1931.00 TO NODE   1926.00 =     460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1926.00 TO NODE   1926.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.23
  RAINFALL INTENSITY(INCH/HR) =   7.27
  TOTAL STREAM AREA(ACRES) =     3.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.69

****************************************************************************
  FLOW PROCESS FROM NODE   1928.00 TO NODE   1927.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1223.00
  DOWNSTREAM ELEVATION(FEET) =   1221.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.169
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.053
```

```
  SUBAREA RUNOFF(CFS) =      0.51
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.51

****************************************************************************
  FLOW PROCESS FROM NODE   1927.00 TO NODE   1926.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1221.00  DOWNSTREAM(FEET) =   1216.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00   CHANNEL SLOPE =  0.0192
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.062
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5800
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.11
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   1.39
  Tc(MIN.) =    7.56
  SUBAREA AREA(ACRES) =     1.90       SUBAREA RUNOFF(CFS) =    7.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.580
  TOTAL AREA(ACRES) =        2.0         PEAK FLOW RATE(CFS) =       8.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   3.76
  LONGEST FLOWPATH FROM NODE   1928.00 TO NODE   1926.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1926.00 TO NODE   1926.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.56
  RAINFALL INTENSITY(INCH/HR) =   7.06
  TOTAL STREAM AREA(ACRES) =     2.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.69     7.23        7.271          3.65
      2        8.23     7.56        7.062          2.01

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.56     7.23        7.271
      2       16.67     7.56        7.062

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.67   Tc(MIN.) =    7.56
  TOTAL AREA(ACRES) =        5.7
  LONGEST FLOWPATH FROM NODE   1931.00 TO NODE   1926.00 =     460.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   1926.00 TO NODE   1925.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1210.00  DOWNSTREAM(FEET) =  1196.00
 FLOW LENGTH(FEET) =   195.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.94
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      16.67
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    7.77
 LONGEST FLOWPATH FROM NODE   1931.00 TO NODE   1925.00 =     655.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1925.00 TO NODE   1925.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       16.67     7.77       6.942        5.66
 LONGEST FLOWPATH FROM NODE   1931.00 TO NODE   1925.00 =     655.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        1.63    13.98       4.750        0.96
 LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1925.00 =     979.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      17.58       7.77        6.942
    2      13.04      13.98        4.750

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      17.58   Tc(MIN.) =    7.77
 TOTAL AREA(ACRES) =        6.6

****************************************************************************
 FLOW PROCESS FROM NODE   1925.00 TO NODE   1925.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1925.00 TO NODE   1924.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1196.00  DOWNSTREAM(FEET) =  1178.00
 FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.34
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      17.58
 PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    8.08
 LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1924.00 =    1264.00 FEET.
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   1924.00 TO NODE   1924.00 IS CODE =  11
--------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       17.58     8.08       6.769        6.62
 LONGEST FLOWPATH FROM NODE   1993.00 TO NODE   1924.00 =    1264.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       49.11     9.16       6.240       24.66
 LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1924.00 =    2439.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      60.87       8.08        6.769
    2      65.31       9.16        6.240

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      65.31   Tc(MIN.) =    9.16
 TOTAL AREA(ACRES) =       31.3

**************************************************************************
 FLOW PROCESS FROM NODE   1924.00 TO NODE   1924.00 IS CODE =  12
--------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
==========================================================================

**************************************************************************
 FLOW PROCESS FROM NODE   1924.00 TO NODE   1912.00 IS CODE =  31
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1178.00  DOWNSTREAM(FEET) =  1087.40
 FLOW LENGTH(FEET) =   690.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  27.73
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      65.31
 PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =    9.58
 LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1912.00 =    3129.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   1912.00 TO NODE   1912.00 IS CODE =  10
--------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==========================================================================

**************************************************************************
 FLOW PROCESS FROM NODE   1921.50 TO NODE   1921.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1201.00
  DOWNSTREAM ELEVATION(FEET) =   1200.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.685
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.650
  SUBAREA RUNOFF(CFS) =      0.11
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.11

****************************************************************************
  FLOW PROCESS FROM NODE   1921.00 TO NODE   1920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.185
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.25
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   6.33
  Tc(MIN.) =   17.02
  SUBAREA AREA(ACRES) =     0.82       SUBAREA RUNOFF(CFS) =    0.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        0.9         PEAK FLOW RATE(CFS) =       0.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   1.50
  LONGEST FLOWPATH FROM NODE   1921.50 TO NODE   1920.00 =     540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1920.00 TO NODE   1917.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1189.00  DOWNSTREAM(FEET) =  1183.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   1.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.81
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.94
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   17.06
  LONGEST FLOWPATH FROM NODE   1921.50 TO NODE   1917.00 =     565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1917.00 TO NODE   1917.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.06
  RAINFALL INTENSITY(INCH/HR) =   4.18
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.94
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1919.00 TO NODE   1918.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1200.00
  DOWNSTREAM ELEVATION(FEET) =   1198.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.169
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.053
  SUBAREA RUNOFF(CFS) =      0.51
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.51

****************************************************************************
  FLOW PROCESS FROM NODE   1918.00 TO NODE   1917.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1198.00  DOWNSTREAM ELEVATION(FEET) = 1189.00
  STREET LENGTH(FEET) =   545.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.24
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   3.28   Tc(MIN.) =    9.45
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.116
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.580
  SUBAREA AREA(ACRES) =    2.71      SUBAREA RUNOFF(CFS) =    9.61
  TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =      10.00

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.03
  FLOW VELOCITY(FEET/SEC.) =  3.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.17
  LONGEST FLOWPATH FROM NODE   1919.00 TO NODE   1917.00 =     625.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1917.00 TO NODE   1917.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.45
 RAINFALL INTENSITY(INCH/HR) =   6.12
 TOTAL STREAM AREA(ACRES) =     2.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.00

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.94    17.06        4.179          0.90
     2       10.00     9.45        6.116          2.82

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       10.52     9.45       6.116
     2        7.78    17.06       4.179

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      10.52   Tc(MIN.) =    9.45
 TOTAL AREA(ACRES) =        3.7
 LONGEST FLOWPATH FROM NODE   1919.00 TO NODE   1917.00 =     625.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1917.00 TO NODE   1914.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1189.00  DOWNSTREAM(FEET) =  1173.00
 FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.40
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.52
 PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    9.70
 LONGEST FLOWPATH FROM NODE   1919.00 TO NODE   1914.00 =     840.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1914.00 TO NODE   1914.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.70
 RAINFALL INTENSITY(INCH/HR) =   6.01
 TOTAL STREAM AREA(ACRES) =     3.72
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.52

****************************************************************************
 FLOW PROCESS FROM NODE   1916.00 TO NODE   1915.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5800
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
```

```
 UPSTREAM ELEVATION(FEET) =   1193.00
 DOWNSTREAM ELEVATION(FEET) =   1189.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.650
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.523
 SUBAREA RUNOFF(CFS) =      1.14
 TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      1.14

****************************************************************************
 FLOW PROCESS FROM NODE   1915.00 TO NODE   1914.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1189.00  DOWNSTREAM ELEVATION(FEET) = 1179.00
 STREET LENGTH(FEET) =   780.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.58
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   10.66
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.89
 STREET FLOW TRAVEL TIME(MIN.) =   4.96   Tc(MIN.) =   10.61
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.677
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.580
 SUBAREA AREA(ACRES) =    3.23      SUBAREA RUNOFF(CFS) =   10.64
 TOTAL AREA(ACRES) =        3.5        PEAK FLOW RATE(CFS) =      11.39

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.34
 FLOW VELOCITY(FEET/SEC.) =  3.00   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
 LONGEST FLOWPATH FROM NODE   1916.00 TO NODE   1914.00 =     875.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1914.00 TO NODE   1914.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.61
 RAINFALL INTENSITY(INCH/HR) =   5.68
 TOTAL STREAM AREA(ACRES) =     3.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.39

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

```
     1       10.52     9.70        6.014          3.72
     2       11.39    10.61        5.677          3.46

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       20.94     9.70       6.014
     2       21.33    10.61       5.677

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.33   Tc(MIN.) =   10.61
  TOTAL AREA(ACRES) =        7.2
  LONGEST FLOWPATH FROM NODE   1916.00 TO NODE   1914.00 =     875.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1914.00 TO NODE   1913.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1173.00  DOWNSTREAM(FEET) =  1089.00
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.35
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.33
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE   1916.00 TO NODE   1913.00 =    1005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1913.00 TO NODE   1913.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.66
  RAINFALL INTENSITY(INCH/HR) =   5.66
  TOTAL STREAM AREA(ACRES) =     7.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.33

****************************************************************************
  FLOW PROCESS FROM NODE   1923.00 TO NODE   1922.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1180.00
  DOWNSTREAM ELEVATION(FEET) =   1168.00
  ELEVATION DIFFERENCE(FEET) =     12.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.738
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.608
  SUBAREA RUNOFF(CFS) =      0.11
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.11
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1922.00 TO NODE   1913.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1168.00  DOWNSTREAM(FEET) =   1095.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   675.00   CHANNEL SLOPE =  0.1081
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.539
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.63
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   4.28
  Tc(MIN.) =   11.02
  SUBAREA AREA(ACRES) =     0.67       SUBAREA RUNOFF(CFS) =    0.93
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       1.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   3.29
  LONGEST FLOWPATH FROM NODE   1923.00 TO NODE   1913.00 =     765.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1913.00 TO NODE   1913.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.02
  RAINFALL INTENSITY(INCH/HR) =   5.54
  TOTAL STREAM AREA(ACRES) =     0.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       21.33    10.66        5.658          7.18
      2        1.01    11.02        5.539          0.73

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       22.31    10.66        5.658
      2       21.89    11.02        5.539

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.31   Tc(MIN.) =   10.66
  TOTAL AREA(ACRES) =        7.9
  LONGEST FLOWPATH FROM NODE   1916.00 TO NODE   1913.00 =    1005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1913.00 TO NODE   1912.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1089.00  DOWNSTREAM(FEET) =  1087.40
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.13
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.31
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   10.99
  LONGEST FLOWPATH FROM NODE   1916.00 TO NODE   1912.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1912.00 TO NODE   1912.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       22.31    10.99       5.548        7.91
  LONGEST FLOWPATH FROM NODE   1916.00 TO NODE   1912.00 =    1165.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       65.31     9.58       6.064       31.28
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1912.00 =    3129.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      84.75       9.58        6.064
      2      82.06      10.99        5.548

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.75   Tc(MIN.) =    9.58
  TOTAL AREA(ACRES) =       39.2

****************************************************************************
  FLOW PROCESS FROM NODE   1912.00 TO NODE   1912.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1912.00 TO NODE   1911.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1087.40  DOWNSTREAM(FEET) =  1079.00
  FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.58
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      84.75
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    9.77
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1911.00 =    3349.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1911.00 TO NODE   1911.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.77
  RAINFALL INTENSITY(INCH/HR) =   5.99
  TOTAL STREAM AREA(ACRES) =    39.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     84.75

****************************************************************************
  FLOW PROCESS FROM NODE   1911.40 TO NODE   1911.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1150.00
  DOWNSTREAM ELEVATION(FEET) =   1140.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.593
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.579
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
  FLOW PROCESS FROM NODE   1911.20 TO NODE   1911.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =   1085.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.2200
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.591
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.57
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =    6.76
  SUBAREA AREA(ACRES) =     0.53       SUBAREA RUNOFF(CFS) =    1.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.257
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       1.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   4.31
  LONGEST FLOWPATH FROM NODE   1911.40 TO NODE   1911.00 =     320.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1911.00 TO NODE   1911.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.76
  RAINFALL INTENSITY(INCH/HR) =   7.59
```

```
 TOTAL STREAM AREA(ACRES) =     0.61
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.19

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       84.75     9.77        5.985         39.19
     2        1.19     6.76        7.591          0.61

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc       INTENSITY
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)
     1       59.81     6.76        7.591
     2       85.68     9.77        5.985

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      85.68   Tc(MIN.) =    9.77
 TOTAL AREA(ACRES) =       39.8
 LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1911.00 =    3349.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1911.00 TO NODE   1907.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1079.00  DOWNSTREAM(FEET) =  1069.30
 FLOW LENGTH(FEET) =   585.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.65
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      85.68
 PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   10.49
 LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1907.00 =    3934.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1907.00 TO NODE   1907.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.49
 RAINFALL INTENSITY(INCH/HR) =   5.72
 TOTAL STREAM AREA(ACRES) =    39.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     85.68

****************************************************************************
 FLOW PROCESS FROM NODE   1910.00 TO NODE   1909.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5800
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
 UPSTREAM ELEVATION(FEET) =   1090.00
 DOWNSTREAM ELEVATION(FEET) =   1079.40
 ELEVATION DIFFERENCE(FEET) =     10.60
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.366
```

```
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.48
 TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
 FLOW PROCESS FROM NODE   1909.00 TO NODE   1908.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1079.40  DOWNSTREAM(FEET) =   1075.80
 CHANNEL LENGTH THRU SUBAREA(FEET) =   360.00   CHANNEL SLOPE =  0.0100
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6100
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.69
 AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   1.63
 Tc(MIN.) =    4.99
 SUBAREA AREA(ACRES) =     6.00       SUBAREA RUNOFF(CFS) =   33.75
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.610
 TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      34.23

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   4.46
 LONGEST FLOWPATH FROM NODE   1910.00 TO NODE   1908.00 =     420.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1908.00 TO NODE   1907.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1070.00  DOWNSTREAM(FEET) =  1069.30
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.94
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      34.23
 PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    5.12
 LONGEST FLOWPATH FROM NODE   1910.00 TO NODE   1907.00 =     490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1907.00 TO NODE   1907.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.12
 RAINFALL INTENSITY(INCH/HR) =   9.08
 TOTAL STREAM AREA(ACRES) =     6.09
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.23

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       85.68    10.49        5.719         39.80
      2       34.23     5.12        9.077          6.09

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       88.21     5.12       9.077
      2      107.25    10.49       5.719

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     107.25   Tc(MIN.) =   10.49
  TOTAL AREA(ACRES) =       45.9
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1907.00 =    3934.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1907.00 TO NODE   1906.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1069.30  DOWNSTREAM(FEET) =  1063.70
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.45
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     107.25
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   10.53
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1906.00 =    3999.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1906.00 TO NODE   1906.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      107.25    10.53       5.704       45.89
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1906.00 =    3999.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       96.66    11.39       5.424       27.98
  LONGEST FLOWPATH FROM NODE   2025.00 TO NODE   1906.00 =    3740.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     196.64     10.53        5.704
      2     198.63     11.39        5.424

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     198.63   Tc(MIN.) =   11.39
  TOTAL AREA(ACRES) =       73.9

****************************************************************************
  FLOW PROCESS FROM NODE   1906.00 TO NODE   1906.00 IS CODE =  12
```

```
------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
========================================================================

************************************************************************
  FLOW PROCESS FROM NODE   1906.00 TO NODE   1907.00 IS CODE =   7
------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
========================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  11.39   RAIN INTENSITY(INCH/HOUR) =  5.42
  TOTAL AREA(ACRES) =    73.90   TOTAL RUNOFF(CFS) =     50.00

************************************************************************
  FLOW PROCESS FROM NODE   1906.00 TO NODE   1905.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1063.70  DOWNSTREAM(FEET) =  1010.00
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  42.11
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.00
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   11.44
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1905.00 =    4114.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   1905.00 TO NODE   1901.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1010.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   815.00   CHANNEL SLOPE =  0.0736
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.063
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.03
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   1.23
  Tc(MIN.) =   12.67
  SUBAREA AREA(ACRES) =    21.06       SUBAREA RUNOFF(CFS) =   34.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.168
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =      80.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =  11.60
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE   1901.00 =    4929.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   1901.00 TO NODE   1901.00 IS CODE =   7
------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
========================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  12.66   RAIN INTENSITY(INCH/HOUR) =  5.06
  TOTAL AREA(ACRES) =    95.00   TOTAL RUNOFF(CFS) =     74.00
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   1901.00 TO NODE     19.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   930.00
  FLOW LENGTH(FEET) =   441.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.92
  GIVEN PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      74.00
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   13.05
  LONGEST FLOWPATH FROM NODE   1958.00 TO NODE     19.00 =    5370.00 FEET.
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       95.0  TC(MIN.) =     13.05
  PEAK FLOW RATE(CFS)   =      74.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS

♀
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-20d.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2014	2013	2	1110	1105	100	0.8	0.13				
2013	2012	6	1105	1077	550	0.81	0.71				
2012	2005	3	1071	1059	300						
2005	2005	10						SAVE TO BANK 1			
2009	2008	2	1090	1088	100	0.8	0.41				
2008	2007	5	1088	1082	600						
2008	2007	8				0.81	6.20				
2007	2006	3	1076	1051	50						
2006	2006	1						1 OF 2			
2011	2010	2	1078	1077	100	0.82	0.20				
2010	2006	6	1077	1057	350	0.82	0.69				
2006	2006	1						2 OF 2			
2006	2005	3	1051	1049	120						
2005	2005	11						ADD BANK 1			
2005	2004	3	1049	1045	100						
2004	2003	5	1045	1042	150						
2004	2003	8				0.35	1.52				
2003	2003	7	Q=11 cfs	Tc=9.93 mins		A=9.9 ac					
2003	2000.5	3	1042	1000	150						
2000.5	2000	5	1000	985	90						
2000.5	2000	8				0.35	2.58				
2000	20.2	4	986.5	969.1	300			EX 30" CSP CALTRANS			
20.2	20.1	4	968.6	958	532			EX 42" CSP CALTRANS			
20.1	20.1	1						1 OF 2			
2002.4	2002.2	2	1035	1025	50	0.35	0.05				
2002.2	2002	5	1025	973	400						
2002.2	2002	8				0.35	1.16				
2002	20.1	4	966.9	958.8	198			EX 24" CSP CALTRANS			
20.1	20.1	1						2 OF 2			
20.1	20	4	957	944.8	200			EX 42" CSP CALTRANS			
							13.65				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY - NEWLAND SIERRA                                    *
* SUBBASIN 20                                                            *
* POST DETENTION AT NODE 2003 WITH 24" OUTLET 12" ABOVE GROUND           *
 ************************************************************************

  FILE NAME: P-20D.DAT
  TIME/DATE OF STUDY: 16:35 01/12/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2014.00 TO NODE   2013.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1110.00
  DOWNSTREAM ELEVATION(FEET) =   1105.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.158
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.96
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.96

****************************************************************************
  FLOW PROCESS FROM NODE   2013.00 TO NODE   2012.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1105.00  DOWNSTREAM ELEVATION(FEET) = 1077.00
  STREET LENGTH(FEET) =   550.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   2.32   Tc(MIN.) =    5.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.696
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.808
  SUBAREA AREA(ACRES) =    0.71      SUBAREA RUNOFF(CFS) =    5.00
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       5.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.44
  FLOW VELOCITY(FEET/SEC.) =  4.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.21
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2012.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2012.00 TO NODE   2005.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1071.00  DOWNSTREAM(FEET) =  1059.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.83
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.91
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    5.99
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2005.00 =     950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2005.00 TO NODE   2005.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2009.00 TO NODE   2008.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1090.00
  DOWNSTREAM ELEVATION(FEET) =   1088.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.834
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      3.02
  TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      3.02

****************************************************************************
  FLOW PROCESS FROM NODE   2008.00 TO NODE   2007.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1088.00  DOWNSTREAM(FEET) =   1082.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.02
  FLOW VELOCITY(FEET/SEC) =   1.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.32   Tc(MIN.) =    9.15
  LONGEST FLOWPATH FROM NODE   2009.00 TO NODE   2007.00 =     700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2008.00 TO NODE   2007.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.245
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8094
  SUBAREA AREA(ACRES) =    6.20   SUBAREA RUNOFF(CFS) =   31.36
  TOTAL AREA(ACRES) =        6.6   TOTAL RUNOFF(CFS) =      33.41
  TC(MIN.) =    9.15

****************************************************************************
  FLOW PROCESS FROM NODE   2007.00 TO NODE   2006.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1076.00  DOWNSTREAM(FEET) =  1051.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  39.35
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.41
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    9.17
  LONGEST FLOWPATH FROM NODE   2009.00 TO NODE   2006.00 =     750.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2006.00 TO NODE   2006.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.17
  RAINFALL INTENSITY(INCH/HR) =   6.24
  TOTAL STREAM AREA(ACRES) =     6.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.41

****************************************************************************
  FLOW PROCESS FROM NODE   2011.00 TO NODE   2010.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1078.00
  DOWNSTREAM ELEVATION(FEET) =   1077.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.063
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.51
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      1.51

****************************************************************************
  FLOW PROCESS FROM NODE   2010.00 TO NODE   2006.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1077.00  DOWNSTREAM ELEVATION(FEET) = 1057.00
  STREET LENGTH(FEET) =   350.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.98
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.26
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =    5.43
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.740
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    0.69      SUBAREA RUNOFF(CFS) =    4.94
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       6.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.51
  FLOW VELOCITY(FEET/SEC.) =  4.68   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  LONGEST FLOWPATH FROM NODE   2011.00 TO NODE   2006.00 =     450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2006.00 TO NODE   2006.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.43
  RAINFALL INTENSITY(INCH/HR) =   8.74
  TOTAL STREAM AREA(ACRES) =     0.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.38

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       33.41     9.17        6.236          6.61
      2        6.38     5.43        8.740          0.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.18     5.43       8.740
      2       37.96     9.17       6.236

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      37.96   Tc(MIN.) =    9.17
  TOTAL AREA(ACRES) =        7.5
  LONGEST FLOWPATH FROM NODE   2009.00 TO NODE   2006.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2006.00 TO NODE   2005.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1051.00  DOWNSTREAM(FEET) =  1049.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.25
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      37.96
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    9.35
  LONGEST FLOWPATH FROM NODE   2009.00 TO NODE   2005.00 =     870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2005.00 TO NODE   2005.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       37.96     9.35       6.159        7.50
  LONGEST FLOWPATH FROM NODE   2009.00 TO NODE   2005.00 =     870.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.91     5.99       8.212        0.84
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2005.00 =     950.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      30.21       5.99        8.212
```

```
     2      42.39       9.35        6.159

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.39   Tc(MIN.) =    9.35
  TOTAL AREA(ACRES) =        8.3

****************************************************************************
  FLOW PROCESS FROM NODE   2005.00 TO NODE   2004.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1049.00  DOWNSTREAM(FEET) =  1045.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.57
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.39
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    9.46
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2004.00 =    1050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2003.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1045.00  DOWNSTREAM(FEET) =   1042.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   150.00   CHANNEL SLOPE =  0.0200
  CHANNEL FLOW THRU SUBAREA(CFS) =      42.39
  FLOW VELOCITY(FEET/SEC) =   5.22 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.48   Tc(MIN.) =    9.93
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2003.00 =    1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2003.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.922
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7394
  SUBAREA AREA(ACRES) =    1.52   SUBAREA RUNOFF(CFS) =    3.15
  TOTAL AREA(ACRES) =        9.9   TOTAL RUNOFF(CFS) =      43.18
  TC(MIN.) =    9.93
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2003.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   9.93   RAIN INTENSITY(INCH/HOUR) =  5.92
  TOTAL AREA(ACRES) =     9.90   TOTAL RUNOFF(CFS) =     11.00

****************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2000.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1042.00  DOWNSTREAM(FEET) =  1000.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.58
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.00
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   10.04
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2000.50 =    1350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.50 TO NODE   2000.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    985.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    90.00   CHANNEL SLOPE =  0.1667
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1433 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      11.00
  FLOW VELOCITY(FEET/SEC) =   4.71 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.32   Tc(MIN.) =   10.35
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE   2000.00 =    1440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.50 TO NODE   2000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.766
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2211
  SUBAREA AREA(ACRES) =    2.58   SUBAREA RUNOFF(CFS) =    5.21
  TOTAL AREA(ACRES) =       12.5   TOTAL RUNOFF(CFS) =      15.91
  TC(MIN.) =   10.35

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE     20.20 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   986.50  DOWNSTREAM(FEET) =   969.10
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.15
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.91
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   10.90
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE     20.20 =    1740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.20 TO NODE     20.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   968.60  DOWNSTREAM(FEET) =   958.00
  FLOW LENGTH(FEET) =   532.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  13.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.07
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.91
  PIPE TRAVEL TIME(MIN.) =   1.46    Tc(MIN.) =   12.36
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE     20.10 =    2272.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.10 TO NODE     20.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.36
  RAINFALL INTENSITY(INCH/HR) =   5.14
  TOTAL STREAM AREA(ACRES) =    12.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.91
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2002.40 TO NODE   2002.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1035.00
  DOWNSTREAM ELEVATION(FEET) =   1025.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.431
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE   2002.20 TO NODE   2002.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    973.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.1300
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1217 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.16
  FLOW VELOCITY(FEET/SEC) =   1.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.41   Tc(MIN.) =    7.84
  LONGEST FLOWPATH FROM NODE   2002.40 TO NODE   2002.00 =     450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2002.20 TO NODE   2002.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.897
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.16   SUBAREA RUNOFF(CFS) =    2.80
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       2.92
  TC(MIN.) =    7.84
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE     20.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   966.90  DOWNSTREAM(FEET) =   958.80
  FLOW LENGTH(FEET) =   198.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.10
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.92
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =    8.49
  LONGEST FLOWPATH FROM NODE   2002.40 TO NODE     20.10 =     648.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.10 TO NODE     20.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.49
  RAINFALL INTENSITY(INCH/HR) =   6.55
  TOTAL STREAM AREA(ACRES) =     1.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.92

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       15.91    12.36        5.143         12.48
      2        2.92     8.49        6.553          1.21

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       13.85     8.49       6.553
      2       18.21    12.36       5.143

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.21   Tc(MIN.) =   12.36
  TOTAL AREA(ACRES) =       13.7
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE     20.10 =    2272.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     20.10 TO NODE     20.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   957.00  DOWNSTREAM(FEET) =   944.80
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.41
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.21
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   12.72
  LONGEST FLOWPATH FROM NODE   2014.00 TO NODE     20.00 =    2472.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       13.7  TC(MIN.) =     12.72
  PEAK FLOW RATE(CFS)   =      18.21
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-21d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2145	2144	2	1055	1050	90	0.35	0.12				
2144	2143	5	1050	1045	250						
2144	2143	8				0.3	0.79				
2143	2126.9	3	1039	1017	775						
2126.9	2126.9	1						1 of 2			
2129	2128	2	1042	1040	80	0.81	0.17				
2128	2127	5	1040	1027	575						
2128	2127	8				0.81	5.35				
2127	2127	7	Tc=7.5 mins	A = 5.5 acres		Q = 1.8 cfs					
2127	2126.9	3	1021	1017	45						
2126.9	2126.9	1						2 of 2			
2126.9	2126.5	3	1017	1014	235						
2126.5	2126.5	1						1 of 2			
2126.8	2126.7	2	1030	1028	85	0.81	0.18				
2126.7	2126.6	5	1028	1025	260						
2126.7	2126.6	8				0.81	1.05				
2126.6	2126.5	3	1019	1014	50						
2126.5	2126.5	1						2 of 2			
2126.5	2101	3	1014	979	1120						
2101	2101	10						save to bank 1			
2134	2133	2	1055	1050	100	0.9	0.12				
2133	2132	6	1050	1040	215	0.9	0.57	2 sides			
2132	2149	3	1034	1017	735						
2149	2149	1						1 of 2			
2131	2130	2	1055	1050	80	0.9	0.15				
2130	2149	6	1050	1023	510	0.47	2.65	2 sides			
2149	2149	1						2 of 2			
2149	2146	3	1017	1013	75						
2146	2146	1						1 of 2			
2147.4	2147.2	2	1035	1031	95	0.9	0.13				
2147.2	2147	6	1031	1020	270	0.9	0.34	2 sides			
2147	2146	3	1014	1013	40						
2146	2146	1						2 of 2			
2146	2125	3	1013	1006	233						
2125	2125	1						1 OF 2			

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Newland Sierra

Job #: 2660-02

Run Name:
P-21d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	2	3
2151	2150	2	1023	1022	65	0.81	0.17				
2150	2125	6	1022	1012	260	0.9	1.00				
2125	2125	1						2 OF 2			
2125	2123.6	3	1006	1004	460						
2123.6	2123.6	1						1 of 3			
2137.5	2137	2	1043	1040	95	0.9	0.22				
2137	2123.6	6	1040	1010	680	0.9	1.74	2 Sides			
2123.6	2123.6	1						2 of 3			
2122	2121	2	1013	1012	68	0.81	0.13				
2121	2123.6	5	1012	1010	311	0.81	2.14				
2123.6	2123.6	1						3 of 3			
2123.6	2118.6	3	1004	995	108						
2118.6	2118.8	5	995	994.8	65	0.3	1.64				
2118.8	2118.7	3	994.8	994.5	305						
2118.7	2118.5	5	994.5	994	195	0.3	1.00				
2118.6	2118.6	7	Tc= 8.82 mins	A = 12 acres		Q = 12.7 Cfs					
2118.5	2118.4	3	994	989	37						
2118.4	2118.4	10						SAVE BANK 2			
2142	2141	2	1110	1101	100	0.9	0.19				
2141	2137	6	1101	1060	425	0.9	0.86	one side			
2137	2138	3	1054	1037	630						
2138	2138	1						1 OF 2			
2140	2139	2	1060	1055	100	0.9	0.21				
2139	2138	6	1055	1043	550	0.9	0.67	one side			
2138	2138	1						2 OF 2			
2138	2136	3	1037	1030	230						
2136	2136	7	Tc = 5.10 mins	A = 1.93 acres		Q = 2cfs					
2136	2107.5	5	1030	1029.5	141	0.25	*				
2107.5	2107.5	1						1 of 2			
2109	2108	2	1075	1071	80	0.25	0.11				
2108	2107	5	1071	1055	108	0.25	0.43				
2107	2107.5	3	1055	1029.5	170						
2107.5	2107.5	1						2 of 2			
2107.5	2106.5	3	1029.5	1029	88						
2106.5	2106.5	10						Save Bank 3			

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Newland Sierra

Job #: 2660-02

Run Name:
P-21d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2116	2115	2	1175	1160	100	0.25	0.06				
2115	2114	5	1160	1070	650	0.25	2.98				
2114	2110	3	1064	1038	490						
2110	2110	1						1 of 2			
2113	2112	2	1070	1060	100	0.25	0.10				
2112	2111	5	1060	1045	370	0.25	2.81				
2111	2110	3	1039	1038	40						
2110	2110	1						2 of 2			
2110	2106.5	3	1038	1029	530						
2106.5	2106.5	11						Add Bank 3			
2106.5	2106.5	12						Clear Bank 3			
2106.5	2104	3	1029	1020	170						
2104	2104	1						1 of 2			
2106	2105	2	1037	1035	80	0.25	0.12				
2105	2104	5	1035	1025	310	0.25	1.77				
2104	2104	1						2 of 2			
2104	2103	3	1025	1015	27						
2103	2103	1						1 of 2			
2103.4	2103.2	2	1240	1215	100	0.35	0.13				
2103.2	2103	5	1215	1018	870	0.29	4.45				
2103	2103	1						2 of 2			
2103	2118.4	3	1012	989	205						
2118.4	2118.4	11						Add Bank 2			
2118.4	2118.4	12						Clear Bank 2			
2118.4	2102	3	989	984	50						
2102	2102	1						1 of 2			
2101.9	2101.8	2	1020	1010	90	0.25	0.16				
2101.8	2102	5	1010	990	477	0.25	1.04				
2102	2102	1						2 of 2			
2102	2101	3	984	977	50						
2101	2101	11						Add Bank 1			
2101	2101	12						Clear Bank 1			

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Newland Sierra

Job #: 2660-02

Run Name:
P-21d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2101	2100	3	977	975	80						
2100	21	5	975	950	450		*				
							35.75				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                     *
* SUB BASIN 21                                                           *
* WITH DETENTION                                                         *
 ************************************************************************

  FILE NAME: P-21D.DAT
  TIME/DATE OF STUDY: 15:06 01/26/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2145.00 TO NODE   2144.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1055.00
  DOWNSTREAM ELEVATION(FEET) =   1050.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.232
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.268
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE   2144.00 TO NODE   2143.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =   1045.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.0200
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0200 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.31
  FLOW VELOCITY(FEET/SEC) =   0.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.26   Tc(MIN.) =   12.49
  LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2143.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2144.00 TO NODE   2143.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.109
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3066
  SUBAREA AREA(ACRES) =    0.79   SUBAREA RUNOFF(CFS) =    1.21
  TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       1.43
  TC(MIN.) =   12.49
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2143.00 TO NODE   2126.90 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1039.00  DOWNSTREAM(FEET) =  1017.00
  FLOW LENGTH(FEET) =   775.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.79
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.43
  PIPE TRAVEL TIME(MIN.) =   2.23    Tc(MIN.) =   14.73
  LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2126.90 =    1115.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2126.90 TO NODE   2126.90 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.73
  RAINFALL INTENSITY(INCH/HR) =   4.59
  TOTAL STREAM AREA(ACRES) =     0.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.43

****************************************************************************
  FLOW PROCESS FROM NODE   2129.00 TO NODE   2128.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1042.00
  DOWNSTREAM ELEVATION(FEET) =   1040.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.440
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.27
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.27

****************************************************************************
  FLOW PROCESS FROM NODE   2128.00 TO NODE   2127.00 IS CODE =  52
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1040.00  DOWNSTREAM(FEET) =   1027.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.0226
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.27
  FLOW VELOCITY(FEET/SEC) =   2.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.06   Tc(MIN.) =    7.50
  LONGEST FLOWPATH FROM NODE   2129.00 TO NODE   2127.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2128.00 TO NODE   2127.00 IS CODE =  81
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.100
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8100
  SUBAREA AREA(ACRES) =    5.35   SUBAREA RUNOFF(CFS) =   30.77
  TOTAL AREA(ACRES) =        5.5   TOTAL RUNOFF(CFS) =      31.75
  TC(MIN.) =    7.50

****************************************************************************
  FLOW PROCESS FROM NODE   2127.00 TO NODE   2127.00 IS CODE =   7
------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
========================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   7.50   RAIN INTENSITY(INCH/HOUR) =  7.10
  TOTAL AREA(ACRES) =     5.50   TOTAL RUNOFF(CFS) =      1.80

****************************************************************************
  FLOW PROCESS FROM NODE   2127.00 TO NODE   2126.90 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1021.00  DOWNSTREAM(FEET) =  1017.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.29
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.80
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    7.58
```

```
 LONGEST FLOWPATH FROM NODE   2129.00 TO NODE   2126.90 =     700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2126.90 TO NODE   2126.90 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.58
 RAINFALL INTENSITY(INCH/HR) =   7.05
 TOTAL STREAM AREA(ACRES) =     5.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.80

 ** CONFLUENCE DATA **
 STREAM     RUNOFF        Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        1.43    14.73        4.595          0.91
     2        1.80     7.58        7.051          5.50

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        2.53     7.58       7.051
     2        2.60    14.73       4.595

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.60   Tc(MIN.) =   14.73
 TOTAL AREA(ACRES) =        6.4
 LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2126.90 =    1115.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2126.90 TO NODE   2126.50 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1017.00  DOWNSTREAM(FEET) =  1014.00
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.18
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.60
```

```
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   15.48
  LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2126.50 =    1350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2126.50 TO NODE   2126.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.48
  RAINFALL INTENSITY(INCH/HR) =   4.45
  TOTAL STREAM AREA(ACRES) =     6.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.60

****************************************************************************
  FLOW PROCESS FROM NODE   2126.80 TO NODE   2126.70 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1030.00
  DOWNSTREAM ELEVATION(FEET) =   1028.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.618
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.34
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      1.34

****************************************************************************
  FLOW PROCESS FROM NODE   2126.70 TO NODE   2126.60 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1028.00  DOWNSTREAM(FEET) =   1025.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00   CHANNEL SLOPE =  0.0115
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.34
  FLOW VELOCITY(FEET/SEC) =   1.71 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.54   Tc(MIN.) =    6.16
  LONGEST FLOWPATH FROM NODE   2126.80 TO NODE   2126.60 =     345.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2126.70 TO NODE   2126.60 IS CODE =  81
```

```
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.061
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8100
  SUBAREA AREA(ACRES) =    1.05   SUBAREA RUNOFF(CFS) =    6.86
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       8.03
  TC(MIN.) =    6.16

************************************************************************
  FLOW PROCESS FROM NODE   2126.60 TO NODE   2126.50 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1019.00  DOWNSTREAM(FEET) =  1014.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.90
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.03
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    6.21
  LONGEST FLOWPATH FROM NODE   2126.80 TO NODE   2126.50 =     395.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   2126.50 TO NODE   2126.50 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.21
  RAINFALL INTENSITY(INCH/HR) =   8.01
  TOTAL STREAM AREA(ACRES) =     1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.03

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.60    15.48        4.448          6.41
      2        8.03     6.21        8.014          1.23

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.47     6.21       8.014
      2        7.06    15.48       4.448

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.47   Tc(MIN.) =    6.21
  TOTAL AREA(ACRES) =        7.6
  LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2126.50 =    1350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2126.50 TO NODE   2101.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1014.00  DOWNSTREAM(FEET) =   979.00
  FLOW LENGTH(FEET) =  1120.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.15
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.47
  PIPE TRAVEL TIME(MIN.) =   1.84    Tc(MIN.) =    8.05
  LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2101.00 =    2470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2134.00 TO NODE   2133.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1055.00
  DOWNSTREAM ELEVATION(FEET) =   1050.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.105
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      1.00
TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
FLOW PROCESS FROM NODE   2133.00 TO NODE   2132.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1050.00  DOWNSTREAM ELEVATION(FEET) = 1040.00
STREET LENGTH(FEET) =   215.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.36
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.24
  HALFSTREET FLOOD WIDTH(FEET) =    5.72
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.78
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
STREET FLOW TRAVEL TIME(MIN.) =   0.95   Tc(MIN.) =    3.05
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .9000
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
SUBAREA AREA(ACRES) =    0.57      SUBAREA RUNOFF(CFS) =    4.73
TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       5.73

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.51
FLOW VELOCITY(FEET/SEC.) =  4.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.16
LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2132.00 =     315.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2132.00 TO NODE   2149.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1034.00  DOWNSTREAM(FEET) =  1017.00
  FLOW LENGTH(FEET) =   735.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.98
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.73
  PIPE TRAVEL TIME(MIN.) =   1.54    Tc(MIN.) =    4.59
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2149.00 =    1050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2149.00 TO NODE   2149.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.59
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.73

****************************************************************************
  FLOW PROCESS FROM NODE   2131.00 TO NODE   2130.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1055.00
  DOWNSTREAM ELEVATION(FEET) =   1050.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.748
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.24
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      1.24

****************************************************************************
  FLOW PROCESS FROM NODE   2130.00 TO NODE   2149.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
```

```
================================================================================
  UPSTREAM ELEVATION(FEET) = 1050.00  DOWNSTREAM ELEVATION(FEET) = 1023.00
  STREET LENGTH(FEET) =   510.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.99
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    7.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.32
  STREET FLOW TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =    3.58
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.493
  SUBAREA AREA(ACRES) =    2.65      SUBAREA RUNOFF(CFS) =   11.49
  TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =      12.73

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.41
  FLOW VELOCITY(FEET/SEC.) =  5.30   DEPTH*VELOCITY(FT*FT/SEC.) =   1.77
  LONGEST FLOWPATH FROM NODE   2131.00 TO NODE   2149.00 =     590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2149.00 TO NODE   2149.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.58
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     2.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.73
```

```
 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.73     4.59        9.222          0.69
     2       12.73     3.58        9.222          2.80

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       17.20     3.58       9.222
     2       18.46     4.59       9.222

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      18.46   Tc(MIN.) =    4.59
 TOTAL AREA(ACRES) =        3.5
 LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2149.00 =    1050.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2149.00 TO NODE   2146.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1017.00  DOWNSTREAM(FEET) =  1013.00
 FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.48
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      18.46
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    4.68
 LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2146.00 =    1125.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2146.00 TO NODE   2146.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    4.68
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     3.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.46

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2147.40 TO NODE   2147.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =   1035.00
 DOWNSTREAM ELEVATION(FEET) =   1031.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.173
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.08
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      1.08

****************************************************************************
 FLOW PROCESS FROM NODE   2147.20 TO NODE   2147.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1031.00  DOWNSTREAM ELEVATION(FEET) = 1020.00
 STREET LENGTH(FEET) =   270.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.49
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.23
   HALFSTREET FLOOD WIDTH(FEET) =    4.99
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.39
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
 STREET FLOW TRAVEL TIME(MIN.) =   1.33   Tc(MIN.) =    3.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.34      SUBAREA RUNOFF(CFS) =    2.82
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       3.90

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.45
  FLOW VELOCITY(FEET/SEC.) =  3.65   DEPTH*VELOCITY(FT*FT/SEC.) =   0.93
  LONGEST FLOWPATH FROM NODE   2147.40 TO NODE   2147.00 =     365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2147.00 TO NODE   2146.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1014.00  DOWNSTREAM(FEET) =  1013.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.40
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.90
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    3.59
  LONGEST FLOWPATH FROM NODE   2147.40 TO NODE   2146.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2146.00 TO NODE   2146.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.59
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.90

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       18.46     4.68        9.222          3.49
      2        3.90     3.59        9.222          0.47

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       22.36     3.59       9.222
      2       22.36     4.68       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.36   Tc(MIN.) =    4.68
  TOTAL AREA(ACRES) =        4.0
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2146.00 =    1125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2146.00 TO NODE   2125.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1013.00  DOWNSTREAM(FEET) =  1006.00
  FLOW LENGTH(FEET) =   233.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.17
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.36
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    5.00
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2125.00 =    1358.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2125.00 TO NODE   2125.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.00
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     3.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.36

****************************************************************************
  FLOW PROCESS FROM NODE   2151.00 TO NODE   2150.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1023.00
  DOWNSTREAM ELEVATION(FEET) =   1022.00
```

```
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.646
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.27
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.27

****************************************************************************
  FLOW PROCESS FROM NODE   2150.00 TO NODE   2125.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1022.00  DOWNSTREAM ELEVATION(FEET) = 1012.00
  STREET LENGTH(FEET) =   260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.42
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.08
  STREET FLOW TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =    4.77
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.887
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    8.30
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       9.57

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.90
  FLOW VELOCITY(FEET/SEC.) =  4.36   DEPTH*VELOCITY(FT*FT/SEC.) =   1.41
  LONGEST FLOWPATH FROM NODE   2151.00 TO NODE   2125.00 =     325.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2125.00 TO NODE   2125.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.77
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.57

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       22.36     5.00        9.222          3.96
      2        9.57     4.77        9.222          1.17

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       31.93     4.77       9.222
      2       31.93     5.00       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.93   Tc(MIN.) =    5.00
  TOTAL AREA(ACRES) =        5.1
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2125.00 =    1358.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2125.00 TO NODE   2123.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1006.00  DOWNSTREAM(FEET) =  1004.00
  FLOW LENGTH(FEET) =   460.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.34
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.93
  PIPE TRAVEL TIME(MIN.) =   1.21    Tc(MIN.) =    6.20
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2123.60 =    1818.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2123.60 TO NODE   2123.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.20
  RAINFALL INTENSITY(INCH/HR) =   8.02
  TOTAL STREAM AREA(ACRES) =     5.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.93

****************************************************************************
  FLOW PROCESS FROM NODE   2137.50 TO NODE   2137.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1043.00
  DOWNSTREAM ELEVATION(FEET) =   1040.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.392
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.83
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.83

****************************************************************************
  FLOW PROCESS FROM NODE   2137.00 TO NODE   2123.60 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1040.00  DOWNSTREAM ELEVATION(FEET) = 1010.00
  STREET LENGTH(FEET) =   680.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.05
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.37
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.42
  STREET FLOW TRAVEL TIME(MIN.) =   2.50   Tc(MIN.) =    4.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.74      SUBAREA RUNOFF(CFS) =   14.44
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =      16.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.03
  FLOW VELOCITY(FEET/SEC.) =  5.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.91
  LONGEST FLOWPATH FROM NODE   2137.50 TO NODE   2123.60 =     775.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2123.60 TO NODE   2123.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.89
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.27

****************************************************************************
  FLOW PROCESS FROM NODE   2122.00 TO NODE   2121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.00
  UPSTREAM ELEVATION(FEET) =   1013.00
  DOWNSTREAM ELEVATION(FEET) =   1012.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.785
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE   2121.00 TO NODE   2123.60 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1012.00  DOWNSTREAM(FEET) =   1010.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   311.00   CHANNEL SLOPE =  0.0064
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.362
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.55
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =    5.82
  SUBAREA AREA(ACRES) =     2.14       SUBAREA RUNOFF(CFS) =   14.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.810
  TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =      15.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   3.06
  LONGEST FLOWPATH FROM NODE   2122.00 TO NODE   2123.60 =     379.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2123.60 TO NODE   2123.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.82
  RAINFALL INTENSITY(INCH/HR) =   8.36
  TOTAL STREAM AREA(ACRES) =     2.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.37

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       31.93     6.20        8.024          5.13
      2       16.27     4.89        9.222          1.96
      3       15.37     5.82        8.362          2.27
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       56.96     4.89       9.222
      2       60.76     5.82       8.362
      3       60.84     6.20       8.024

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      60.84   Tc(MIN.) =    6.20
  TOTAL AREA(ACRES) =        9.4
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2123.60 =    1818.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2123.60 TO NODE   2118.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1004.00  DOWNSTREAM(FEET) =   995.00
  FLOW LENGTH(FEET) =   108.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.48
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.84
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    6.28
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2118.60 =    1926.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2118.60 TO NODE   2118.80 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    995.00  DOWNSTREAM(FEET) =    994.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =    65.00   CHANNEL SLOPE =  0.0031
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.706
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.37
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   0.32
```

```
  Tc(MIN.) =    6.60
  SUBAREA AREA(ACRES) =     1.64       SUBAREA RUNOFF(CFS) =    3.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.687
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      60.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   3.34
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2118.80 =    1991.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2118.80 TO NODE   2118.70 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   994.80  DOWNSTREAM(FEET) =   994.50
  FLOW LENGTH(FEET) =   305.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  42.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.32
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.84
  PIPE TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =    7.78
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2118.70 =    2296.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2118.70 TO NODE   2118.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    994.50  DOWNSTREAM(FEET) =    994.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.0026
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.395
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.14
  AVERAGE FLOW DEPTH(FEET) =   2.48   TRAVEL TIME(MIN.) =   1.04
  Tc(MIN.) =    8.82
  SUBAREA AREA(ACRES) =     1.00       SUBAREA RUNOFF(CFS) =    1.92
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.655
  TOTAL AREA(ACRES) =       12.0         PEAK FLOW RATE(CFS) =      60.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.46   FLOW VELOCITY(FEET/SEC.) =   3.12
```

```
 LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2118.50 =    2491.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2118.60 TO NODE   2118.60 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   8.82   RAIN INTENSITY(INCH/HOUR) =  6.39
 TOTAL AREA(ACRES) =    12.00   TOTAL RUNOFF(CFS) =     12.70

****************************************************************************
 FLOW PROCESS FROM NODE   2118.50 TO NODE   2118.40 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   994.00  DOWNSTREAM(FEET) =   989.00
 FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.85
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.70
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    8.85
 LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2118.40 =    2528.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2118.40 TO NODE   2118.40 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2142.00 TO NODE   2141.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1110.00
 DOWNSTREAM ELEVATION(FEET) =   1101.00
 ELEVATION DIFFERENCE(FEET) =      9.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.731
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      1.58
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.58

****************************************************************************
  FLOW PROCESS FROM NODE   2141.00 TO NODE   2137.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1101.00  DOWNSTREAM ELEVATION(FEET) = 1060.00
  STREET LENGTH(FEET) =   425.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.86
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =    2.84
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.86      SUBAREA RUNOFF(CFS) =    7.14
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       8.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.47
  FLOW VELOCITY(FEET/SEC.) =  7.18   DEPTH*VELOCITY(FT*FT/SEC.) =   2.41
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2137.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2137.00 TO NODE   2138.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1054.00  DOWNSTREAM(FEET) =  1037.00
  FLOW LENGTH(FEET) =   630.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.41
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.71
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =    3.96
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2138.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2138.00 TO NODE   2138.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.96
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.71

****************************************************************************
  FLOW PROCESS FROM NODE   2140.00 TO NODE   2139.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1060.00
  DOWNSTREAM ELEVATION(FEET) =   1055.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.105
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.74
  TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      1.74

****************************************************************************
  FLOW PROCESS FROM NODE   2139.00 TO NODE   2138.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1055.00  DOWNSTREAM ELEVATION(FEET) = 1043.00
```

```
  STREET LENGTH(FEET) =   550.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.19
  STREET FLOW TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =    4.76
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.67      SUBAREA RUNOFF(CFS) =    5.56
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       7.30

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.28
  FLOW VELOCITY(FEET/SEC.) =  3.88   DEPTH*VELOCITY(FT*FT/SEC.) =   1.52
  LONGEST FLOWPATH FROM NODE   2140.00 TO NODE   2138.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2138.00 TO NODE   2138.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.76
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.30

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.71     3.96        9.222          1.05
      2        7.30     4.76        9.222          0.88

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       14.80     3.96       9.222
      2       16.02     4.76       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.02   Tc(MIN.) =    4.76
  TOTAL AREA(ACRES) =        1.9
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2138.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2138.00 TO NODE   2136.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1037.00  DOWNSTREAM(FEET) =  1030.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.16
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.02
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    5.10
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2136.00 =    1385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2136.00 TO NODE   2136.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.10   RAIN INTENSITY(INCH/HOUR) =  9.10
  TOTAL AREA(ACRES) =     1.93   TOTAL RUNOFF(CFS) =      2.40

****************************************************************************
  FLOW PROCESS FROM NODE   2136.00 TO NODE   2107.50 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =   1029.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   141.00   CHANNEL SLOPE =  0.0035
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.40
  FLOW VELOCITY(FEET/SEC) =   1.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =    7.31
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2107.50 =    1526.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2107.50 TO NODE   2107.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.31
  RAINFALL INTENSITY(INCH/HR) =   7.22
  TOTAL STREAM AREA(ACRES) =     1.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.40

****************************************************************************
  FLOW PROCESS FROM NODE   2109.00 TO NODE   2108.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =   1071.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.003
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.808
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
  FLOW PROCESS FROM NODE   2108.00 TO NODE   2107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1071.00  DOWNSTREAM(FEET) =   1055.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   108.00   CHANNEL SLOPE =  0.1481
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.493
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.95
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   0.61
  Tc(MIN.) =    8.61
  SUBAREA AREA(ACRES) =     0.43       SUBAREA RUNOFF(CFS) =    0.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   3.42
  LONGEST FLOWPATH FROM NODE   2109.00 TO NODE   2107.00 =     188.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2107.00 TO NODE   2107.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1055.00  DOWNSTREAM(FEET) =  1029.50
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   1.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.00
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.88
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    8.93
  LONGEST FLOWPATH FROM NODE   2109.00 TO NODE   2107.50 =     358.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2107.50 TO NODE   2107.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.93
  RAINFALL INTENSITY(INCH/HR) =   6.34
  TOTAL STREAM AREA(ACRES) =     0.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.88

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.40     7.31        7.220          1.93
      2        0.88     8.93        6.345          0.54
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        3.12     7.31       7.220
      2        2.99     8.93       6.345

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.12   Tc(MIN.) =    7.31
  TOTAL AREA(ACRES) =        2.5
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2107.50 =    1526.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2107.50 TO NODE   2106.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1029.50  DOWNSTREAM(FEET) =  1029.00
  FLOW LENGTH(FEET) =    88.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.06
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.12
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    7.67
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2106.50 =    1614.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2106.50 TO NODE   2106.50 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2116.00 TO NODE   2115.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1175.00
  DOWNSTREAM ELEVATION(FEET) =   1160.00
```

```
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.11
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.11

****************************************************************************
  FLOW PROCESS FROM NODE   2115.00 TO NODE   2114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.1385
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.178
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.92
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =    9.30
  SUBAREA AREA(ACRES) =     2.98       SUBAREA RUNOFF(CFS) =    4.60
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        3.0         PEAK FLOW RATE(CFS) =       4.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   6.08
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2114.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2114.00 TO NODE   2110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1064.00  DOWNSTREAM(FEET) =  1038.00
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.21
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.70
  PIPE TRAVEL TIME(MIN.) =   0.80    Tc(MIN.) =   10.10
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2110.00 =    1240.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2110.00 TO NODE   2110.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.10
  RAINFALL INTENSITY(INCH/HR) =   5.86
  TOTAL STREAM AREA(ACRES) =     3.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.70

****************************************************************************
  FLOW PROCESS FROM NODE   2113.00 TO NODE   2112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1070.00
  DOWNSTREAM ELEVATION(FEET) =   1060.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE   2112.00 TO NODE   2111.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1060.00  DOWNSTREAM(FEET) =   1045.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   370.00   CHANNEL SLOPE =  0.0405
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.312
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.25
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   1.90
```

```
  Tc(MIN.) =    9.00
  SUBAREA AREA(ACRES) =     2.81       SUBAREA RUNOFF(CFS) =    4.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       4.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   4.01
  LONGEST FLOWPATH FROM NODE   2113.00 TO NODE   2111.00 =     470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2111.00 TO NODE   2110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1039.00  DOWNSTREAM(FEET) =  1038.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.74
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.59
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.09
  LONGEST FLOWPATH FROM NODE   2113.00 TO NODE   2110.00 =     510.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2110.00 TO NODE   2110.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.09
  RAINFALL INTENSITY(INCH/HR) =   6.27
  TOTAL STREAM AREA(ACRES) =     2.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.70    10.10        5.858          3.04
      2        4.59     9.09        6.273          2.91

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.81     9.09       6.273
      2        8.98    10.10       5.858

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.98   Tc(MIN.) =   10.10
  TOTAL AREA(ACRES) =        5.9
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2110.00 =    1240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2110.00 TO NODE   2106.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1038.00  DOWNSTREAM(FEET) =  1029.00
  FLOW LENGTH(FEET) =   530.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.93
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.98
  PIPE TRAVEL TIME(MIN.) =   1.11    Tc(MIN.) =   11.22
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2106.50 =    1770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2106.50 TO NODE   2106.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        8.98    11.22       5.476        5.95
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2106.50 =    1770.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.12     7.67       6.999        2.47
  LONGEST FLOWPATH FROM NODE   2142.00 TO NODE   2106.50 =    1614.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       9.26       7.67        6.999
      2      11.42      11.22        5.476
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.42   Tc(MIN.) =   11.22
  TOTAL AREA(ACRES) =        8.4

****************************************************************************
  FLOW PROCESS FROM NODE   2106.50 TO NODE   2106.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2106.50 TO NODE   2104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1029.00  DOWNSTREAM(FEET) =  1020.00
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.97
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.42
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   11.44
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2104.00 =    1940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2104.00 TO NODE   2104.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.44
  RAINFALL INTENSITY(INCH/HR) =   5.41
  TOTAL STREAM AREA(ACRES) =     8.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.42

****************************************************************************
  FLOW PROCESS FROM NODE   2106.00 TO NODE   2105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
```

```
  UPSTREAM ELEVATION(FEET) =   1037.00
  DOWNSTREAM ELEVATION(FEET) =   1035.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.083
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.866
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE   2105.00 TO NODE   2104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =   1025.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   310.00   CHANNEL SLOPE =  0.0323
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.190
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.45
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.11
  Tc(MIN.) =   12.19
  SUBAREA AREA(ACRES) =     1.77       SUBAREA RUNOFF(CFS) =    2.30
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        1.9         PEAK FLOW RATE(CFS) =       2.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   3.03
  LONGEST FLOWPATH FROM NODE   2106.00 TO NODE   2104.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2104.00 TO NODE   2104.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.19
  RAINFALL INTENSITY(INCH/HR) =   5.19
  TOTAL STREAM AREA(ACRES) =     1.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.45

  ** CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.42    11.44        5.408          8.42
      2        2.45    12.19        5.190          1.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       13.72    11.44       5.408
      2       13.41    12.19       5.190

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.72   Tc(MIN.) =   11.44
  TOTAL AREA(ACRES) =       10.3
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2104.00 =    1940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2104.00 TO NODE   2103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1025.00  DOWNSTREAM(FEET) =  1015.00
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.74
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.72
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   11.45
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2103.00 =    1967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.45
  RAINFALL INTENSITY(INCH/HR) =   5.40
  TOTAL STREAM AREA(ACRES) =    10.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.72

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2103.40 TO NODE   2103.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1240.00
  DOWNSTREAM ELEVATION(FEET) =   1215.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2103.20 TO NODE   2103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1215.00  DOWNSTREAM(FEET) =   1018.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   870.00   CHANNEL SLOPE =  0.2264
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.664
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.22
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =    8.27
  SUBAREA AREA(ACRES) =     4.45       SUBAREA RUNOFF(CFS) =    8.60
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.292
  TOTAL AREA(ACRES) =        4.6         PEAK FLOW RATE(CFS) =       8.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   8.95
  LONGEST FLOWPATH FROM NODE   2103.40 TO NODE   2103.00 =     970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.27
  RAINFALL INTENSITY(INCH/HR) =   6.66
  TOTAL STREAM AREA(ACRES) =     4.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.90

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.72    11.45        5.403         10.31
      2        8.90     8.27        6.664          4.58

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       20.03     8.27       6.664
      2       20.94    11.45       5.403

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.94   Tc(MIN.) =   11.45
  TOTAL AREA(ACRES) =       14.9
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2103.00 =    1967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2118.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1012.00  DOWNSTREAM(FEET) =   989.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.95
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.94
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   11.62
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2118.40 =    2172.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2118.40 TO NODE   2118.40 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       20.94    11.62       5.352       14.89
  LONGEST FLOWPATH FROM NODE   2116.00 TO NODE   2118.40 =    2172.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       12.70     8.85       6.379       12.00
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2118.40 =    2528.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      28.65       8.85        6.379
      2      31.59      11.62        5.352

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.59   Tc(MIN.) =   11.62
  TOTAL AREA(ACRES) =       26.9

****************************************************************************
  FLOW PROCESS FROM NODE   2118.40 TO NODE   2118.40 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2118.40 TO NODE   2102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   989.00  DOWNSTREAM(FEET) =   984.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.15
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.59
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   11.66
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2102.00 =    2578.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.66
  RAINFALL INTENSITY(INCH/HR) =   5.34
  TOTAL STREAM AREA(ACRES) =    26.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.59

******************************************************************************
  FLOW PROCESS FROM NODE   2101.90 TO NODE   2101.90 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1020.00
  DOWNSTREAM ELEVATION(FEET) =   1010.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.738
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.608
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.30

******************************************************************************
  FLOW PROCESS FROM NODE   2101.80 TO NODE   2102.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1010.00  DOWNSTREAM(FEET) =    990.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   477.00   CHANNEL SLOPE =  0.0419
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.912
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.47
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =    9.96
  SUBAREA AREA(ACRES) =     1.04       SUBAREA RUNOFF(CFS) =    1.54
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       1.77
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   2.96
  LONGEST FLOWPATH FROM NODE   2101.90 TO NODE   2102.00 =     567.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.96
  RAINFALL INTENSITY(INCH/HR) =   5.91
  TOTAL STREAM AREA(ACRES) =     1.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.77

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       31.59    11.66        5.340         26.89
      2        1.77     9.96        5.912          1.20

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       28.75     9.96       5.912
      2       33.20    11.66       5.340

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.20   Tc(MIN.) =   11.66
  TOTAL AREA(ACRES) =       28.1
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2102.00 =    2578.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2101.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   984.00  DOWNSTREAM(FEET) =   977.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.84
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      33.20
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   11.70
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2101.00 =    2628.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       33.20    11.70       5.330       28.09
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2101.00 =    2628.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        9.47     8.05       6.780        7.64
  LONGEST FLOWPATH FROM NODE   2145.00 TO NODE   2101.00 =    2470.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      32.33       8.05        6.780
      2      40.64      11.70        5.330

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      40.64   Tc(MIN.) =   11.70
  TOTAL AREA(ACRES) =       35.7

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   977.00  DOWNSTREAM(FEET) =   975.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.17
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      40.64
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   11.80
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE   2100.00 =    2708.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE     21.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    975.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00   CHANNEL SLOPE =  0.0556
  CHANNEL FLOW THRU SUBAREA(CFS) =      40.64
  FLOW VELOCITY(FEET/SEC) =   8.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   12.67
  LONGEST FLOWPATH FROM NODE   2134.00 TO NODE     21.00 =    3158.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       35.7  TC(MIN.) =     12.67
  PEAK FLOW RATE(CFS)   =      40.64
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Proposed Condition

BASIN B

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

Newland Sierra

Job #: 2660-02

Run Name:
P-22d.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
298	297	2	1003.2	1001	75	0.9	0.11				
297	296	6	1001	982.5	440	0.9	0.38	1 SIDE			
296	292	3	976.5	976	35						
292	292	1						1 OF 2			
295	294	2	1003.2	1001	75	0.9	0.10				
294	293	6	1001	978	430	0.9	0.55	1 SIDE			
293	292	3	972	971.5	40						
292	292	1						2 OF 2			
292	288	3	971.5	929	595						
288	288	1						1 OF 2			
291	290	2	994	987	100	0.9	0.09				
290	289	6	987	936	680	0.9	1.36	1 SIDE			
289	288	3	930	929	28						
288	288	1						2 OF 2			
288	285	3	929	890	595						
285	285	1						1 OF 2			
287	286	2	947	937	100	0.9	0.11				
286	285	6	937	896	585	0.9	1.26	2 SIDES			
285	285	1						2 OF 2			
285	281	3	890	851	595						
281	281	1						1 OF 2			
284	283	2	898	891	90	0.9	0.16				
283	282	6	891	857	530	0.9	1.04	2 SIDES			
282	281	3	851.5	851	25						
281	281	1						2 OF 2			
281	277	3	851	840	250						
277	277	1						1 OF 2			
280	279	2	858	853	100	0.9	0.09				
279	278	6	853	846.6	185	0.9	0.21	1 SIDE			
278	277	3	840.5	840	38						
277	277	1						2 OF 2			
277	275	3	840	837	237						
275	275	1						1 OF 2			

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

Newland Sierra

Job #: 2660-02

Run Name:
P-22d.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
280	276	2	858	853	100	0.9	0.09				
276	275	6	853	840.1	390	0.9	0.40	1 SIDE			
275	275	1						2 OF 2			
275	274	3	837	836.5	20						
274	273	5	836.5	835	150			VALLEY			
274	273	8				0.3	0.40				
273	273	7	Tc=7.4 A=6.4 Q=18								
273	272	3	835	834	65						
272	272	10						SAVE TO BANK 1			
2203	2202	2	1445	1405	100	0.35	0.08				
2202	2201	5	1405	890	1382			MTN			
2202	2201	8				0.45	18.06				
2201	2200	5	890	835	428			MTN			
2201	2200	8				0.43	2.14				
2200	2200	1						1 OF 2			
2207	2206	2	1295	1270	100	0.35	0.15				
2206	2205	5	1270	1070	475			MTN			
2206	2205	8				0.46	4.44				
2205	2200	5	1070	840.1	930			MTN			
2205	2200	8				0.45	10.76				
2200	2200	1						2 OF 2			
2200	272	3	840.1	834	13						
272	272	11						ADD BANK 1			
272	22	3	834	820	100						
							41.98				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* WITH DETENTION AT NODE 273                                             *
* SUB-BASIN 22                                                           *
 ************************************************************************

  FILE NAME: P-22D.DAT
  TIME/DATE OF STUDY: 15:13 01/26/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    298.00 TO NODE    297.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1003.20
  DOWNSTREAM ELEVATION(FEET) =   1001.00
  ELEVATION DIFFERENCE(FEET) =      2.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.178
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE    297.00 TO NODE    296.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1001.00  DOWNSTREAM ELEVATION(FEET) =  982.50
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.49
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.21
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
  STREET FLOW TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =    4.06
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.38      SUBAREA RUNOFF(CFS) =    3.15
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       4.07

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.05
  FLOW VELOCITY(FEET/SEC.) =  4.34   DEPTH*VELOCITY(FT*FT/SEC.) =   1.33
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    296.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    296.00 TO NODE    292.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   976.50  DOWNSTREAM(FEET) =   976.00
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.10
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.07
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    4.15
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    292.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    292.00 TO NODE    292.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.15
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.07

****************************************************************************
  FLOW PROCESS FROM NODE    295.00 TO NODE    294.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
```

```
  UPSTREAM ELEVATION(FEET) =   1003.20
  DOWNSTREAM ELEVATION(FEET) =   1001.00
  ELEVATION DIFFERENCE(FEET) =      2.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.178
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE    294.00 TO NODE    293.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1001.00  DOWNSTREAM ELEVATION(FEET) =  978.00
  STREET LENGTH(FEET) =   430.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.25
  STREET FLOW TRAVEL TIME(MIN.) =   1.58   Tc(MIN.) =    3.76
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.55      SUBAREA RUNOFF(CFS) =    4.56
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       5.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.67
  FLOW VELOCITY(FEET/SEC.) =  5.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.64
  LONGEST FLOWPATH FROM NODE    295.00 TO NODE    293.00 =     505.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    293.00 TO NODE    292.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   972.00  DOWNSTREAM(FEET) =   971.50
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.25
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.39
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    3.87
  LONGEST FLOWPATH FROM NODE    295.00 TO NODE    292.00 =     545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    292.00 TO NODE    292.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.87
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.07     4.15        9.222          0.49
      2        5.39     3.87        9.222          0.65

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.18     3.87       9.222
      2        9.46     4.15       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.46   Tc(MIN.) =    4.15
  TOTAL AREA(ACRES) =        1.1
```

```
 LONGEST FLOWPATH FROM NODE    298.00 TO NODE    292.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    292.00 TO NODE    288.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   971.50  DOWNSTREAM(FEET) =   929.00
 FLOW LENGTH(FEET) =   595.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.79
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.46
 PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =    4.87
 LONGEST FLOWPATH FROM NODE    298.00 TO NODE    288.00 =    1145.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    288.00 TO NODE    288.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    4.87
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     1.14
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.46

****************************************************************************
 FLOW PROCESS FROM NODE    291.00 TO NODE    290.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    994.00
 DOWNSTREAM ELEVATION(FEET) =    987.00
 ELEVATION DIFFERENCE(FEET) =      7.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.882
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.75
 TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    290.00 TO NODE    289.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  987.00  DOWNSTREAM ELEVATION(FEET) =  936.00
  STREET LENGTH(FEET) =   680.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.94
  STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =    3.75
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.36      SUBAREA RUNOFF(CFS) =   11.29
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =      12.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.61
  FLOW VELOCITY(FEET/SEC.) =  7.05   DEPTH*VELOCITY(FT*FT/SEC.) =   2.67
  LONGEST FLOWPATH FROM NODE    291.00 TO NODE    289.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    289.00 TO NODE    288.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   930.00  DOWNSTREAM(FEET) =   929.00
  FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.013
```

```
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.30
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.03
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    3.79
 LONGEST FLOWPATH FROM NODE    291.00 TO NODE    288.00 =     808.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    288.00 TO NODE    288.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.79
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     1.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.03

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        9.46     4.87        9.222          1.14
     2       12.03     3.79        9.222          1.45

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       21.50     3.79       9.222
     2       21.50     4.87       9.222

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      21.50   Tc(MIN.) =    4.87
 TOTAL AREA(ACRES) =        2.6
 LONGEST FLOWPATH FROM NODE    298.00 TO NODE    288.00 =    1145.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    288.00 TO NODE    285.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   929.00  DOWNSTREAM(FEET) =   890.00
 FLOW LENGTH(FEET) =   595.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.18
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.50
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =    5.48
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    285.00 =    1740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    285.00 TO NODE    285.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.48
  RAINFALL INTENSITY(INCH/HR) =   8.69
  TOTAL STREAM AREA(ACRES) =     2.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.50

****************************************************************************
  FLOW PROCESS FROM NODE    287.00 TO NODE    286.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    947.00
  DOWNSTREAM ELEVATION(FEET) =    937.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.671
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE    286.00 TO NODE    285.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  937.00  DOWNSTREAM ELEVATION(FEET) =  896.00
  STREET LENGTH(FEET) =   585.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.14
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.05
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.34
  STREET FLOW TRAVEL TIME(MIN.) =   1.93   Tc(MIN.) =    3.60
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.26      SUBAREA RUNOFF(CFS) =   10.46
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =      11.37

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.33
  FLOW VELOCITY(FEET/SEC.) =  5.75   DEPTH*VELOCITY(FT*FT/SEC.) =   1.80
  LONGEST FLOWPATH FROM NODE    287.00 TO NODE    285.00 =     685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    285.00 TO NODE    285.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.60
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.37
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.37

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       21.50     5.48        8.688          2.59
      2       11.37     3.60        9.222          1.37
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       31.62     3.60       9.222
      2       32.21     5.48       8.688

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      32.21   Tc(MIN.) =    5.48
  TOTAL AREA(ACRES) =        4.0
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    285.00 =    1740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    285.00 TO NODE    281.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   890.00  DOWNSTREAM(FEET) =   851.00
  FLOW LENGTH(FEET) =   595.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.92
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.21
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    6.04
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    281.00 =    2335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    281.00 TO NODE    281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.04
  RAINFALL INTENSITY(INCH/HR) =   8.17
  TOTAL STREAM AREA(ACRES) =     3.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.21

****************************************************************************
  FLOW PROCESS FROM NODE    284.00 TO NODE    283.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =    898.00
  DOWNSTREAM ELEVATION(FEET) =    891.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.724
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.33
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      1.33

****************************************************************************
  FLOW PROCESS FROM NODE    283.00 TO NODE    282.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  891.00  DOWNSTREAM ELEVATION(FEET) =  857.00
  STREET LENGTH(FEET) =   530.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.64
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.87
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.26
  STREET FLOW TRAVEL TIME(MIN.) =   1.85   Tc(MIN.) =    3.57
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    8.63
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       9.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
 DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   8.99
 FLOW VELOCITY(FEET/SEC.) =  5.38   DEPTH*VELOCITY(FT*FT/SEC.) =   1.65
 LONGEST FLOWPATH FROM NODE    284.00 TO NODE    282.00 =     620.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    282.00 TO NODE    281.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   851.50  DOWNSTREAM(FEET) =   851.00
 FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.64
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.96
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    3.62
 LONGEST FLOWPATH FROM NODE    284.00 TO NODE    281.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    281.00 TO NODE    281.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.62
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     1.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.96

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       32.21     6.04        8.166          3.96
     2        9.96     3.62        9.222          1.20

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       38.48     3.62       9.222
     2       41.03     6.04       8.166

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      41.03   Tc(MIN.) =    6.04
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    281.00 =    2335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    281.00 TO NODE    277.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   851.00  DOWNSTREAM(FEET) =   840.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.24
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.03
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    6.29
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    277.00 =    2585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    277.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.29
  RAINFALL INTENSITY(INCH/HR) =   7.95
  TOTAL STREAM AREA(ACRES) =     5.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.03

****************************************************************************
  FLOW PROCESS FROM NODE    280.00 TO NODE    279.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    858.00
  DOWNSTREAM ELEVATION(FEET) =    853.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.105
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    279.00 TO NODE    278.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  853.00  DOWNSTREAM ELEVATION(FEET) =  846.60
  STREET LENGTH(FEET) =   185.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.62
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
  STREET FLOW TRAVEL TIME(MIN.) =   0.92   Tc(MIN.) =    3.03
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.21      SUBAREA RUNOFF(CFS) =    1.74
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       2.49

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.55
  FLOW VELOCITY(FEET/SEC.) =  3.62   DEPTH*VELOCITY(FT*FT/SEC.) =   1.00
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    278.00 =     285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    278.00 TO NODE    277.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.50  DOWNSTREAM(FEET) =   840.00
```

```
  FLOW LENGTH(FEET) =    38.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.17
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.49
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    3.15
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    277.00 =     323.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    277.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.15
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.49

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       41.03     6.29        7.950          5.16
      2        2.49     3.15        9.222          0.30

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       37.86     3.15       9.222
      2       43.17     6.29       7.950

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      43.17   Tc(MIN.) =    6.29
  TOTAL AREA(ACRES) =        5.5
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    277.00 =    2585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    275.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   840.00  DOWNSTREAM(FEET) =   837.00
  FLOW LENGTH(FEET) =   237.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.17
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.17
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    6.68
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    275.00 =    2822.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    275.00 TO NODE    275.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.68
  RAINFALL INTENSITY(INCH/HR) =   7.65
  TOTAL STREAM AREA(ACRES) =     5.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     43.17

****************************************************************************
  FLOW PROCESS FROM NODE    280.00 TO NODE    276.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    858.00
  DOWNSTREAM ELEVATION(FEET) =    853.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.105
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    276.00 TO NODE    275.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  853.00  DOWNSTREAM ELEVATION(FEET) =  840.10
  STREET LENGTH(FEET) =   390.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.41
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.98
  STREET FLOW TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =    3.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    3.32
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       4.07

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.53
  FLOW VELOCITY(FEET/SEC.) =  3.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.26
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    275.00 =     490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    275.00 TO NODE    275.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.94
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.07

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       43.17     6.68        7.648          5.46
```

```
     2        4.07     3.94        9.222          0.49

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       39.87     3.94       9.222
      2       46.55     6.68       7.648

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      46.55   Tc(MIN.) =    6.68
  TOTAL AREA(ACRES) =        5.9
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    275.00 =    2822.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    275.00 TO NODE    274.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   837.00  DOWNSTREAM(FEET) =   836.50
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.78
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      46.55
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.71
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    274.00 =    2842.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    274.00 TO NODE    273.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    836.50  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   150.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =      46.55
  FLOW VELOCITY(FEET/SEC) =   3.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =    7.37
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    273.00 =    2992.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    274.00 TO NODE    273.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.183
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8622
  SUBAREA AREA(ACRES) =    0.40   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        6.3   TOTAL RUNOFF(CFS) =      46.55
  TC(MIN.) =    7.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    273.00 TO NODE    273.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   7.40   RAIN INTENSITY(INCH/HOUR) =  7.16
  TOTAL AREA(ACRES) =     6.40   TOTAL RUNOFF(CFS) =     18.00

****************************************************************************
  FLOW PROCESS FROM NODE    273.00 TO NODE    272.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   835.00  DOWNSTREAM(FEET) =   834.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.83
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.00
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    7.52
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    272.00 =    3057.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    272.00 TO NODE    272.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1445.00
  DOWNSTREAM ELEVATION(FEET) =   1405.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1405.00  DOWNSTREAM(FEET) =    890.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1382.00   CHANNEL SLOPE =  0.3726
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2092 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.22
  FLOW VELOCITY(FEET/SEC) =   2.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.99   Tc(MIN.) =   15.26
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2201.00 =    1482.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.490
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4496
  SUBAREA AREA(ACRES) =   18.06   SUBAREA RUNOFF(CFS) =   36.49
  TOTAL AREA(ACRES) =       18.1   TOTAL RUNOFF(CFS) =      36.62
  TC(MIN.) =   15.26

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    835.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   428.00   CHANNEL SLOPE =  0.1285
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1207 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      36.62
  FLOW VELOCITY(FEET/SEC) =   6.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   16.36
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2200.00 =    1910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.292
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4475
  SUBAREA AREA(ACRES) =    2.14   SUBAREA RUNOFF(CFS) =    3.95
  TOTAL AREA(ACRES) =       20.3   TOTAL RUNOFF(CFS) =      38.95
  TC(MIN.) =   16.36

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2200.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.36
  RAINFALL INTENSITY(INCH/HR) =   4.29
  TOTAL STREAM AREA(ACRES) =    20.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.95

****************************************************************************
  FLOW PROCESS FROM NODE   2207.00 TO NODE   2206.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1295.00
  DOWNSTREAM ELEVATION(FEET) =   1270.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.42
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
 FLOW PROCESS FROM NODE   2206.00 TO NODE   2205.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1270.00  DOWNSTREAM(FEET) =   1070.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.4211
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2165 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.42
 FLOW VELOCITY(FEET/SEC) =   2.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.04   Tc(MIN.) =    9.30
 LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2205.00 =     575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2206.00 TO NODE   2205.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.178
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4564
 SUBAREA AREA(ACRES) =    4.44   SUBAREA RUNOFF(CFS) =   12.62
 TOTAL AREA(ACRES) =        4.6   TOTAL RUNOFF(CFS) =      12.94
 TC(MIN.) =    9.30

****************************************************************************
 FLOW PROCESS FROM NODE   2205.00 TO NODE   2200.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =    840.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.2472
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1791 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      12.94
 FLOW VELOCITY(FEET/SEC) =   5.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =   12.09
 LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2200.00 =    1505.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2205.00 TO NODE   2200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.217
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4519
  SUBAREA AREA(ACRES) =   10.76   SUBAREA RUNOFF(CFS) =   25.26
  TOTAL AREA(ACRES) =       15.4   TOTAL RUNOFF(CFS) =      36.19
  TC(MIN.) =   12.09

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2200.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.09
  RAINFALL INTENSITY(INCH/HR) =   5.22
  TOTAL STREAM AREA(ACRES) =    15.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.19

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       38.95    16.36        4.292         20.28
      2       36.19    12.09        5.217         15.35

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       64.97    12.09       5.217
      2       68.73    16.36       4.292

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      68.73   Tc(MIN.) =   16.36
  TOTAL AREA(ACRES) =       35.6
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2200.00 =    1910.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE    272.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.10  DOWNSTREAM(FEET) =   834.00
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  45.84
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      68.73
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =   16.37
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE    272.00 =    1923.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    272.00 TO NODE    272.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       68.73    16.37       4.291       35.63
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE    272.00 =    1923.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       18.00     7.52       7.086        6.40
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE    272.00 =    3057.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      49.58       7.52        7.086
      2      79.63      16.37        4.291

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      79.63   Tc(MIN.) =   16.37
  TOTAL AREA(ACRES) =       42.0

****************************************************************************
  FLOW PROCESS FROM NODE    272.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   834.00  DOWNSTREAM(FEET) =   820.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.14
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      79.63
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   16.43
  LONGEST FLOWPATH FROM NODE    298.00 TO NODE     22.00 =    3157.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       42.0  TC(MIN.) =     16.43
  PEAK FLOW RATE(CFS)   =      79.63
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-22.1.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2213	2212	2	1260	1230	100	0.35	0.39				
2212	2211	5	1230	1095	655						
2212	2211	8				0.46	2.91				
2211	2210	5	1095	850	835						
2211	2210	8				0.44	8.02				
2210	22.1	3	850	837	100						
							11.32				

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
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                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 22.1                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-22-1.DAT
  TIME/DATE OF STUDY: 14:50 11/17/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2213.00 TO NODE   2212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1260.00
  DOWNSTREAM ELEVATION(FEET) =   1230.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      1.09
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      1.09

****************************************************************************
  FLOW PROCESS FROM NODE   2212.00 TO NODE   2211.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1095.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   655.00   CHANNEL SLOPE =  0.2061
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1631 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.09
  FLOW VELOCITY(FEET/SEC) =   2.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.69   Tc(MIN.) =   10.96
  LONGEST FLOWPATH FROM NODE   2213.00 TO NODE   2211.00 =     755.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2212.00 TO NODE   2211.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.558
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4470
  SUBAREA AREA(ACRES) =    2.91   SUBAREA RUNOFF(CFS) =    7.44
  TOTAL AREA(ACRES) =        3.3   TOTAL RUNOFF(CFS) =       8.20
  TC(MIN.) =   10.96
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2211.00 TO NODE   2210.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1095.00  DOWNSTREAM(FEET) =    850.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   835.00   CHANNEL SLOPE =  0.2934
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1934 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.20
  FLOW VELOCITY(FEET/SEC) =   4.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.80   Tc(MIN.) =   13.77
  LONGEST FLOWPATH FROM NODE   2213.00 TO NODE   2210.00 =    1590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2211.00 TO NODE   2210.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.799
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4420
  SUBAREA AREA(ACRES) =    8.02   SUBAREA RUNOFF(CFS) =   16.93
  TOTAL AREA(ACRES) =       11.3   TOTAL RUNOFF(CFS) =      24.01
  TC(MIN.) =   13.77

****************************************************************************
  FLOW PROCESS FROM NODE   2210.00 TO NODE     22.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   850.00  DOWNSTREAM(FEET) =   837.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.01
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   13.84
  LONGEST FLOWPATH FROM NODE   2213.00 TO NODE     22.10 =    1690.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       11.3  TC(MIN.) =     13.84
  PEAK FLOW RATE(CFS)   =      24.01
============================================================================
```

==========

END OF RATIONAL METHOD ANALYSIS

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Newland Sierra

Job #: 2660-02

Run Name:
P-22.2.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2223	2222	2	1235	1234	100	0.35	0.29				
2222	2221	5	1234	1115	530			MTN			
2222	2221	8				0.45	6.34				
2221	2220	5	1115	885	735			MTN			
2221	2220	8				0.45	6.71				
2220	22.2	3	885	865	110						
							13.34				

```
******************************************************************************

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                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 22.2                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-22-2.DAT
  TIME/DATE OF STUDY: 15:31 11/17/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2223.00 TO NODE   2222.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1235.00
  DOWNSTREAM ELEVATION(FEET) =   1234.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.884
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.584
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2222.00 TO NODE   2221.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1234.00  DOWNSTREAM(FEET) =   1115.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.2245
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1715 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.57
  FLOW VELOCITY(FEET/SEC) =   2.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.81   Tc(MIN.) =   14.69
  LONGEST FLOWPATH FROM NODE   2223.00 TO NODE   2221.00 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2222.00 TO NODE   2221.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.601
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4456
```

```
  SUBAREA AREA(ACRES) =    6.34   SUBAREA RUNOFF(CFS) =   13.13
  TOTAL AREA(ACRES) =        6.6   TOTAL RUNOFF(CFS) =      13.59
  TC(MIN.) =   14.69

****************************************************************************
  FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   735.00   CHANNEL SLOPE =  0.3129
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1982 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      13.59
  FLOW VELOCITY(FEET/SEC) =   5.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =   16.75
  LONGEST FLOWPATH FROM NODE   2223.00 TO NODE   2220.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.228
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4478
  SUBAREA AREA(ACRES) =    6.71   SUBAREA RUNOFF(CFS) =   12.77
  TOTAL AREA(ACRES) =       13.3   TOTAL RUNOFF(CFS) =      25.26
  TC(MIN.) =   16.75

****************************************************************************
  FLOW PROCESS FROM NODE   2220.00 TO NODE     22.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   885.00  DOWNSTREAM(FEET) =   865.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.26
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   16.83
  LONGEST FLOWPATH FROM NODE   2223.00 TO NODE     22.20 =    1475.00 FEET.
```

```
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       13.3  TC(MIN.) =     16.83
  PEAK FLOW RATE(CFS)   =      25.26
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-22.3.DAT
Page 1
of

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2232	2231	2	1240	1195	100	0.35	0.26				
2231	2230	5	1195	930	490						
2231	2230	8				0.45	4.32				
2230	22.3	3	930	882	180						
							4.58				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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                              Analysis prepared by:

                                Fuscoe Engineering
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                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 22.3                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-22-3.DAT
  TIME/DATE OF STUDY: 15:35 11/17/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2232.00 TO NODE   2231.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1240.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.73
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
  FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   490.00   CHANNEL SLOPE =  0.5408
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2270 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.73
  FLOW VELOCITY(FEET/SEC) =   2.67 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.06   Tc(MIN.) =    9.33
  LONGEST FLOWPATH FROM NODE   2232.00 TO NODE   2230.00 =     590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.168
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4443
  SUBAREA AREA(ACRES) =    4.32   SUBAREA RUNOFF(CFS) =   11.99
  TOTAL AREA(ACRES) =        4.6   TOTAL RUNOFF(CFS) =      12.55
  TC(MIN.) =    9.33
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2230.00 TO NODE     22.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   930.00  DOWNSTREAM(FEET) =   882.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.55
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    9.45
  LONGEST FLOWPATH FROM NODE   2232.00 TO NODE     22.30 =     770.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.6  TC(MIN.) =      9.45
  PEAK FLOW RATE(CFS)   =      12.55
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-22.4.DAT
Page 1
of

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2242	2241	2	1205	1135	100	0.35	0.15				
2241	2240	5	1135	920	830						
2241	2240	8				0.35	4.00				
2240	22.4	3	920	900	115						
							4.15				

```
**************************************************************************

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                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 22.4                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-22-4.DAT
  TIME/DATE OF STUDY: 15:38 11/17/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2242.00 TO NODE   2241.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1205.00
  DOWNSTREAM ELEVATION(FEET) =   1135.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00   CHANNEL SLOPE =  0.2590
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1830 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.42
  FLOW VELOCITY(FEET/SEC) =   2.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.77   Tc(MIN.) =   12.04
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2240.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.231
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    4.00   SUBAREA RUNOFF(CFS) =    7.32
  TOTAL AREA(ACRES) =        4.2   TOTAL RUNOFF(CFS) =       7.60
  TC(MIN.) =   12.04
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2240.00 TO NODE     22.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   920.00  DOWNSTREAM(FEET) =   900.00
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.89
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.60
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   12.15
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE     22.40 =    1045.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.2  TC(MIN.) =     12.15
  PEAK FLOW RATE(CFS)   =       7.60
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-23d.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2304	2303	2	1325	1268	100	0.35	1.04				
2303	2301	5	1268	863	1070			MTN			
2303	2301	8				0.35	7.47				
2301	2300	5	863	803	480			MTN			
2301	2300	8				0.45	15.54				
2300	23.01	3	803	797.5	100						
23.01	23.01	10						SAVE TO BANK 1			
23.9	23.8	2	826.6	823.2	80	0.9	0.10				
23.8	23.04	6	823.2	809.5	650	0.9	2.35	2 SIDES			
23.04	23.04	1						1 OF 2			
23.7	23.6	2	814.7	814	85	0.9	0.17				
23.6	23.5	6	814	812.9	355	0.9	0.79	2 SIDES			
23.5	23.04	3	807	803	400						
23.04	23.04	1						2 OF 2			
23.04	23.03	3	803	800	75						
23.03	23.02	5	800	799.5	35			VALLEY			
23.03	23.02	8				0.3	0.61				
23.02	23.02	7	Tc= 5.3 A=4.1 Q=5.0								
23.02	23.01	3	799.5	797.5	190						
23.01	23.01	11						ADD BANK 1			
23.01	23	3	797.5	790	35						
							28.07				

```
**************************************************************************

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                              Analysis prepared by:

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                               6390 Greenwich Drive
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                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* WITH DETENTION AT NODE 23.02                                           *
* SUB-BASIN 23                                                           *
 ************************************************************************

  FILE NAME: P-23D.DAT
  TIME/DATE OF STUDY: 16:11 01/27/2017
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2304.00 TO NODE   2303.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1325.00
  DOWNSTREAM ELEVATION(FEET) =   1268.00
  ELEVATION DIFFERENCE(FEET) =     57.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      2.90
  TOTAL AREA(ACRES) =      1.04   TOTAL RUNOFF(CFS) =      2.90

****************************************************************************
  FLOW PROCESS FROM NODE   2303.00 TO NODE   2301.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.00  DOWNSTREAM(FEET) =    863.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00   CHANNEL SLOPE =  0.3785
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2102 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.90
  FLOW VELOCITY(FEET/SEC) =   3.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.87   Tc(MIN.) =   11.14
  LONGEST FLOWPATH FROM NODE   2304.00 TO NODE   2301.00 =    1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2303.00 TO NODE   2301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.501
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    7.47   SUBAREA RUNOFF(CFS) =   14.38
  TOTAL AREA(ACRES) =        8.5   TOTAL RUNOFF(CFS) =      16.39
  TC(MIN.) =   11.14
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    863.00  DOWNSTREAM(FEET) =    803.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   480.00   CHANNEL SLOPE =  0.1250
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1183 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      16.39
  FLOW VELOCITY(FEET/SEC) =   4.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =   12.77
  LONGEST FLOWPATH FROM NODE   2304.00 TO NODE   2300.00 =    1650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.036
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4146
  SUBAREA AREA(ACRES) =   15.54   SUBAREA RUNOFF(CFS) =   35.21
  TOTAL AREA(ACRES) =       24.0   TOTAL RUNOFF(CFS) =      50.21
  TC(MIN.) =   12.77

****************************************************************************
  FLOW PROCESS FROM NODE   2300.00 TO NODE     23.01 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   803.00  DOWNSTREAM(FEET) =   797.50
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.26
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.21
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   12.87
  LONGEST FLOWPATH FROM NODE   2304.00 TO NODE     23.01 =    1750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.01 TO NODE     23.01 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```

```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     23.90 TO NODE     23.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    826.60
  DOWNSTREAM ELEVATION(FEET) =    823.20
  ELEVATION DIFFERENCE(FEET) =      3.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.988
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE     23.80 TO NODE     23.04 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  823.20  DOWNSTREAM ELEVATION(FEET) =  809.50
  STREET LENGTH(FEET) =   650.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.53
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.57
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.28
  STREET FLOW TRAVEL TIME(MIN.) =   3.04   Tc(MIN.) =    5.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.192
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    2.35      SUBAREA RUNOFF(CFS) =   19.44
  TOTAL AREA(ACRES) =        2.4        PEAK FLOW RATE(CFS) =      20.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.21
  FLOW VELOCITY(FEET/SEC.) =  4.17   DEPTH*VELOCITY(FT*FT/SEC.) =   1.79
  LONGEST FLOWPATH FROM NODE     23.90 TO NODE     23.04 =     730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.04 TO NODE     23.04 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.02
  RAINFALL INTENSITY(INCH/HR) =   9.19
  TOTAL STREAM AREA(ACRES) =     2.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.27

****************************************************************************
  FLOW PROCESS FROM NODE     23.70 TO NODE     23.60 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    814.70
  DOWNSTREAM ELEVATION(FEET) =    814.00
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.968
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    59.71
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.41
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.41

****************************************************************************
  FLOW PROCESS FROM NODE     23.60 TO NODE     23.50 IS CODE =  62
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  814.00  DOWNSTREAM ELEVATION(FEET) =  812.90
  STREET LENGTH(FEET) =   355.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.49
  STREET FLOW TRAVEL TIME(MIN.) =   4.35   Tc(MIN.) =    7.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.213
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    5.13
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       6.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  13.98
  FLOW VELOCITY(FEET/SEC.) =  1.50   DEPTH*VELOCITY(FT*FT/SEC.) =   0.61
  LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.50 =     440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.50 TO NODE     23.04 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   807.00  DOWNSTREAM(FEET) =   803.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.95
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.23
```

```
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =    8.44
  LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.04 =     840.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.04 TO NODE     23.04 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.44
  RAINFALL INTENSITY(INCH/HR) =   6.58
  TOTAL STREAM AREA(ACRES) =     0.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.27     5.02        9.192          2.45
      2        6.23     8.44        6.580          0.96

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       23.98     5.02       9.192
      2       20.74     8.44       6.580

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.98   Tc(MIN.) =    5.02
  TOTAL AREA(ACRES) =        3.4
  LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.04 =     840.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.04 TO NODE     23.03 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   803.00  DOWNSTREAM(FEET) =   800.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.88
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.98
```

```
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    5.11
  LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.03 =     915.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.03 TO NODE     23.02 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    799.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    35.00   CHANNEL SLOPE =  0.0143
  CHANNEL FLOW THRU SUBAREA(CFS) =      23.98
  FLOW VELOCITY(FEET/SEC) =   3.76 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.16   Tc(MIN.) =    5.27
  LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.02 =     950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.03 TO NODE     23.02 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.914
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8090
  SUBAREA AREA(ACRES) =    0.61   SUBAREA RUNOFF(CFS) =    1.63
  TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =      28.99
  TC(MIN.) =    5.27

****************************************************************************
  FLOW PROCESS FROM NODE     23.02 TO NODE     23.02 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.30   RAIN INTENSITY(INCH/HOUR) =  8.88
  TOTAL AREA(ACRES) =     4.10   TOTAL RUNOFF(CFS) =      5.00

****************************************************************************
  FLOW PROCESS FROM NODE     23.02 TO NODE     23.01 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   799.50  DOWNSTREAM(FEET) =   797.50
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
```

```
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.75
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.00
 PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    5.85
 LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.01 =    1140.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.01 TO NODE     23.01 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        5.00     5.85       8.333        4.10
 LONGEST FLOWPATH FROM NODE     23.70 TO NODE     23.01 =    1140.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       50.21    12.87       5.013       24.05
 LONGEST FLOWPATH FROM NODE   2304.00 TO NODE     23.01 =    1750.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      27.83       5.85        8.333
     2      53.22      12.87        5.013

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      53.22   Tc(MIN.) =   12.87
 TOTAL AREA(ACRES) =       28.1

****************************************************************************
 FLOW PROCESS FROM NODE     23.01 TO NODE     23.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   797.50  DOWNSTREAM(FEET) =   790.00
 FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  31.87
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      53.22
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   12.88
```

```
  LONGEST FLOWPATH FROM NODE   2304.00 TO NODE     23.00 =    1785.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       28.1  TC(MIN.) =     12.88
  PEAK FLOW RATE(CFS)   =      53.22
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-23.1.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2312	2311	2	1150	1080	100	0.46	0.13				
2311	2310	5	1080	818	880			MTN			
2311	2310	8				0.43	4.09				
2310	23.1	3	818	803	125						
							4.22				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 23.1                                                         *
 ************************************************************************

  FILE NAME: P-23-1.DAT
  TIME/DATE OF STUDY: 14:35 11/17/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2312.00 TO NODE   2311.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1150.00
  DOWNSTREAM ELEVATION(FEET) =   1080.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   2311.00 TO NODE   2310.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    818.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   880.00   CHANNEL SLOPE =  0.2977
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1944 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.53
  FLOW VELOCITY(FEET/SEC) =   2.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.94   Tc(MIN.) =   11.29
  LONGEST FLOWPATH FROM NODE   2312.00 TO NODE   2310.00 =     980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2311.00 TO NODE   2310.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.454
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4309
  SUBAREA AREA(ACRES) =    4.09   SUBAREA RUNOFF(CFS) =    9.59
  TOTAL AREA(ACRES) =        4.2   TOTAL RUNOFF(CFS) =       9.92
  TC(MIN.) =   11.29
```

```
**************************************************************************
  FLOW PROCESS FROM NODE   2310.00 TO NODE     23.10 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   818.00  DOWNSTREAM(FEET) =   803.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.92
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   11.41
  LONGEST FLOWPATH FROM NODE   2312.00 TO NODE     23.10 =    1105.00 FEET.
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.2  TC(MIN.) =     11.41
  PEAK FLOW RATE(CFS)   =       9.92
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-23.2

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2323	2322	2	1350	1300	100	0.46	0.29				
2322	2321	5	1300	950	715			MTN			
2322	2321	8				0.46	2.78				
2321	2320	5	950	813	660			MTN			
2321	2320	8				0.42	4.13				
2320	23.2	3	813	795	140						
							7.20				

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
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              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 23.2                                                         *
 ************************************************************************

  FILE NAME: P-23-2.DAT
  TIME/DATE OF STUDY: 14:08 11/17/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2323.00 TO NODE   2322.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1350.00
  DOWNSTREAM ELEVATION(FEET) =   1300.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
  SUBAREA RUNOFF(CFS) =      1.18
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.18

****************************************************************************
  FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   715.00   CHANNEL SLOPE =  0.4895
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2240 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.18
  FLOW VELOCITY(FEET/SEC) =   2.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.26   Tc(MIN.) =    9.61
  LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2321.00 =     815.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.052
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
  SUBAREA AREA(ACRES) =    2.78   SUBAREA RUNOFF(CFS) =    7.74
  TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       8.55
  TC(MIN.) =    9.61
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    813.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   660.00   CHANNEL SLOPE =  0.2076
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1638 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.55
  FLOW VELOCITY(FEET/SEC) =   4.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.38   Tc(MIN.) =   11.98
  LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2320.00 =    1475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.248
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4371
  SUBAREA AREA(ACRES) =    4.13   SUBAREA RUNOFF(CFS) =    9.10
  TOTAL AREA(ACRES) =        7.2   TOTAL RUNOFF(CFS) =      16.52
  TC(MIN.) =   11.98

****************************************************************************
  FLOW PROCESS FROM NODE   2320.00 TO NODE     23.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   813.00  DOWNSTREAM(FEET) =   795.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.83
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.52
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   12.10
  LONGEST FLOWPATH FROM NODE   2323.00 TO NODE     23.20 =    1615.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.2  TC(MIN.) =     12.10
  PEAK FLOW RATE(CFS)   =      16.52
```

==========
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END OF RATIONAL METHOD ANALYSIS

FUSCOE
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6390 Greenwich Drive, Suite 170
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Newland Sierra

Job #: 2660-02

Run Name:
P-23.3

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2333	2332	2	1270	1195	100	0.46	0.31				
2332	2331	5	1195	925	515						
2332	2331	8				0.46	2.23				
2331	2330	5	925	823	500						
2331	2330	8				0.43	4.32				
2330	23.3	3	823	798	470						
							6.86				

```
**************************************************************************

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              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 23.3                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-23-3.DAT
  TIME/DATE OF STUDY: 11:17 11/18/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2333.00 TO NODE   2332.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =     75.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
  SUBAREA RUNOFF(CFS) =      1.26
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      1.26

****************************************************************************
  FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    925.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.5243
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2262 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.26
  FLOW VELOCITY(FEET/SEC) =   2.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.98   Tc(MIN.) =    8.33
  LONGEST FLOWPATH FROM NODE   2333.00 TO NODE   2331.00 =     615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.634
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
  SUBAREA AREA(ACRES) =    2.23   SUBAREA RUNOFF(CFS) =    6.80
  TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       7.75
  TC(MIN.) =    8.33
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    925.00  DOWNSTREAM(FEET) =    823.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00   CHANNEL SLOPE =  0.2040
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1620 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.75
  FLOW VELOCITY(FEET/SEC) =   4.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =   10.20
  LONGEST FLOWPATH FROM NODE   2333.00 TO NODE   2330.00 =    1115.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.822
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4411
  SUBAREA AREA(ACRES) =    4.32   SUBAREA RUNOFF(CFS) =   10.81
  TOTAL AREA(ACRES) =        6.9   TOTAL RUNOFF(CFS) =      17.62
  TC(MIN.) =   10.20

****************************************************************************
  FLOW PROCESS FROM NODE   2330.00 TO NODE     23.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   823.00  DOWNSTREAM(FEET) =   798.00
  FLOW LENGTH(FEET) =   470.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.33
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.62
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   10.75
  LONGEST FLOWPATH FROM NODE   2333.00 TO NODE     23.30 =    1585.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.9  TC(MIN.) =     10.75
  PEAK FLOW RATE(CFS)   =      17.62
============================================================================
```

==========

END OF RATIONAL METHOD ANALYSIS

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Newland Sierra

Job #: 2660-02

Run Name:
P-23.4

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2343	2342	2	1360	1305	100	0.34	0.12				
2342	2341	5	1305	890	900						
2342	2341	8				0.45	3.46				
2341	2340	5	890	820	520						
2341	2340	8				0.42	5.96				
2340	260	3	820	809	100						
260	260	1						1 OF 2			
270	268	2	846.6	844.1	80	0.9	0.08				
268	266	6	844.1	826.6	570	0.9	1.13	2 SIDES			
266	264	3	820	818	200						
264	262	5	818	817.8	20			VALLEY			
264	262	8				0.3	0.16				
262	262	7	Tc=5.5 A=1.4 Q=1.2								
262	260	3	812	809	245						
260	260	1						2 OF 2			
260	23.4	3	809	795	35						
							10.91				

```
**************************************************************************

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                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* WITH DETENTION AT NODE 262                                             *
* SUB-BASIN 23.4                                                         *
 ************************************************************************

  FILE NAME: P-23-4D.DAT
  TIME/DATE OF STUDY: 15:49 12/09/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2343.00 TO NODE   2342.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1360.00
  DOWNSTREAM ELEVATION(FEET) =   1305.00
  ELEVATION DIFFERENCE(FEET) =     55.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.350
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE   2342.00 TO NODE   2341.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =    890.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00   CHANNEL SLOPE =  0.4611
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2211 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.32
  FLOW VELOCITY(FEET/SEC) =   2.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.70   Tc(MIN.) =   12.05
  LONGEST FLOWPATH FROM NODE   2343.00 TO NODE   2341.00 =    1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2342.00 TO NODE   2341.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.230
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4463
  SUBAREA AREA(ACRES) =    3.46   SUBAREA RUNOFF(CFS) =    8.14
  TOTAL AREA(ACRES) =        3.6   TOTAL RUNOFF(CFS) =       8.36
  TC(MIN.) =   12.05
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2341.00 TO NODE   2340.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.1346
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1247 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.36
  FLOW VELOCITY(FEET/SEC) =   4.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =   14.21
  LONGEST FLOWPATH FROM NODE   2343.00 TO NODE   2340.00 =    1520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2341.00 TO NODE   2340.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.702
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4299
  SUBAREA AREA(ACRES) =    5.96   SUBAREA RUNOFF(CFS) =   11.77
  TOTAL AREA(ACRES) =        9.5   TOTAL RUNOFF(CFS) =      19.28
  TC(MIN.) =   14.21

****************************************************************************
  FLOW PROCESS FROM NODE   2340.00 TO NODE    260.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   820.00  DOWNSTREAM(FEET) =   809.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.42
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.28
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   14.29
  LONGEST FLOWPATH FROM NODE   2343.00 TO NODE    260.00 =    1620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE    260.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.29
  RAINFALL INTENSITY(INCH/HR) =   4.68
  TOTAL STREAM AREA(ACRES) =     9.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.28

************************************************************************
  FLOW PROCESS FROM NODE    270.00 TO NODE    268.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    846.60
  DOWNSTREAM ELEVATION(FEET) =    844.10
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.202
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.66

************************************************************************
  FLOW PROCESS FROM NODE    268.00 TO NODE    266.00 IS CODE =  62
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) =  844.10  DOWNSTREAM ELEVATION(FEET) =  826.60
  STREET LENGTH(FEET) =   570.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.35
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.03
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
  STREET FLOW TRAVEL TIME(MIN.) =   2.71   Tc(MIN.) =    4.91
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.13      SUBAREA RUNOFF(CFS) =    9.38
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =      10.04

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.56
  FLOW VELOCITY(FEET/SEC.) =  4.07   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
  LONGEST FLOWPATH FROM NODE    270.00 TO NODE    266.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    266.00 TO NODE    264.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   820.00  DOWNSTREAM(FEET) =   818.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.69
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.04
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    5.41
  LONGEST FLOWPATH FROM NODE    270.00 TO NODE    264.00 =     850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    262.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    818.00  DOWNSTREAM(FEET) =    817.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =    20.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =      10.04
  FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.13   Tc(MIN.) =    5.54
  LONGEST FLOWPATH FROM NODE    270.00 TO NODE    262.00 =     870.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    262.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.631
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8299
  SUBAREA AREA(ACRES) =    0.16   SUBAREA RUNOFF(CFS) =    0.41
  TOTAL AREA(ACRES) =        1.4   TOTAL RUNOFF(CFS) =      10.04
  TC(MIN.) =    5.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    262.00 TO NODE    262.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.50   RAIN INTENSITY(INCH/HOUR) =  8.67
  TOTAL AREA(ACRES) =     1.40   TOTAL RUNOFF(CFS) =      1.20

****************************************************************************
  FLOW PROCESS FROM NODE    262.00 TO NODE    260.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   812.00  DOWNSTREAM(FEET) =   809.00
  FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.20
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =    6.50
  LONGEST FLOWPATH FROM NODE    270.00 TO NODE    260.00 =    1115.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE    260.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    6.50
  RAINFALL INTENSITY(INCH/HR) =   7.79
  TOTAL STREAM AREA(ACRES) =     1.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.20

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       19.28    14.29        4.684          9.54
      2        1.20     6.50        7.785          1.40

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.97     6.50       7.785
      2       20.00    14.29       4.684

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.00   Tc(MIN.) =   14.29
  TOTAL AREA(ACRES) =       10.9
  LONGEST FLOWPATH FROM NODE   2343.00 TO NODE    260.00 =    1620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE     23.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   809.00  DOWNSTREAM(FEET) =   795.00
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.66
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.00
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   14.31
  LONGEST FLOWPATH FROM NODE   2343.00 TO NODE     23.40 =    1655.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       10.9  TC(MIN.) =     14.31
  PEAK FLOW RATE(CFS)   =      20.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-24d.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
258	257	2	814.7	814	70	0.9	0.17				
257	256	6	814	808.4	175	0.9	0.36				
256	253	3	802	798	400						
253	253	1						1 OF 2			
255	254	2	809.9	807.7	80	0.9	0.13				
254	253	6	807.7	804.1	360	0.9	1.40	2 SIDES			
253	253	1						2 OF 2			
253	252	3	798	795.5	70						
252	251	5	795.5	795	50						
252	251	8				0.3	0.90				
251	251	7	Tc=5.7 A=3.0 Q=4.5								
251	245	3	795	793	180						
245	245	1						1 OF 3			
2403	2402	2	1360	1310	95	0.46	0.33				
2402	2401	5	1310	1130	305						
2402	2401	8				0.46	1.82				
2401	2400	5	1130	805	1315						
2401	2400	8				0.44	29.06				
2400	245	3	805	793	55						
245	245	1						2 OF 3			
250	249	2	812.2	812	80	0.9	0.09				
249	248	6	812	808.2	230	0.9	0.23				
248	247	3	802	800	100						
247	246	5	800	799	85						
247	246	8				0.3	0.41				
246	245	3	799	793	125						
245	245	1						3 OF 3			
							34.90				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* WITH DETENTION AT NODE 251                                             *
* SUB-BASIN 24                                                           *
 **************************************************************************

  FILE NAME: P-24D.DAT
  TIME/DATE OF STUDY: 16:20 12/09/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    258.00 TO NODE    257.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    814.70
  DOWNSTREAM ELEVATION(FEET) =    814.00
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.902
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.41
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.41

****************************************************************************
  FLOW PROCESS FROM NODE    257.00 TO NODE    256.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  814.00  DOWNSTREAM ELEVATION(FEET) =  808.40
  STREET LENGTH(FEET) =   175.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.90
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   0.92   Tc(MIN.) =    3.82
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.36      SUBAREA RUNOFF(CFS) =    2.99
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       4.40

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.21
  FLOW VELOCITY(FEET/SEC.) =  3.45   DEPTH*VELOCITY(FT*FT/SEC.) =   0.93
  LONGEST FLOWPATH FROM NODE    258.00 TO NODE    256.00 =     245.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    256.00 TO NODE    253.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   802.00  DOWNSTREAM(FEET) =   798.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.46
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.40
  PIPE TRAVEL TIME(MIN.) =   1.22    Tc(MIN.) =    5.05
  LONGEST FLOWPATH FROM NODE    258.00 TO NODE    253.00 =     645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    253.00 TO NODE    253.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.05
  RAINFALL INTENSITY(INCH/HR) =   9.17
  TOTAL STREAM AREA(ACRES) =     0.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.40

****************************************************************************
  FLOW PROCESS FROM NODE    255.00 TO NODE    254.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    809.90
  DOWNSTREAM ELEVATION(FEET) =    807.70
  ELEVATION DIFFERENCE(FEET) =      2.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.298
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.08
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      1.08

****************************************************************************
  FLOW PROCESS FROM NODE    254.00 TO NODE    253.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  807.70  DOWNSTREAM ELEVATION(FEET) =  804.10
  STREET LENGTH(FEET) =   360.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   2.49   Tc(MIN.) =    4.79
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.40      SUBAREA RUNOFF(CFS) =   11.62
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =      12.70
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.66
  FLOW VELOCITY(FEET/SEC.) =  2.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.17
  LONGEST FLOWPATH FROM NODE    255.00 TO NODE    253.00 =     440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    253.00 TO NODE    253.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.79
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.40     5.05        9.167          0.53
      2       12.70     4.79        9.222          1.53

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.87     4.79       9.222
      2       17.02     5.05       9.167

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.02   Tc(MIN.) =    5.05
  TOTAL AREA(ACRES) =        2.1
  LONGEST FLOWPATH FROM NODE    258.00 TO NODE    253.00 =     645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    253.00 TO NODE    252.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   798.00  DOWNSTREAM(FEET) =   795.50
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.07
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.02
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    5.14
  LONGEST FLOWPATH FROM NODE    258.00 TO NODE    252.00 =     715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    252.00 TO NODE    251.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    795.50  DOWNSTREAM(FEET) =    795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0100 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      17.02
  FLOW VELOCITY(FEET/SEC) =   1.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =    5.72
  LONGEST FLOWPATH FROM NODE    258.00 TO NODE    251.00 =     765.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    252.00 TO NODE    251.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.454
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7176
  SUBAREA AREA(ACRES) =    0.90   SUBAREA RUNOFF(CFS) =    2.28
  TOTAL AREA(ACRES) =        3.0   TOTAL RUNOFF(CFS) =      17.96
  TC(MIN.) =    5.72

****************************************************************************
  FLOW PROCESS FROM NODE    251.00 TO NODE    251.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.70   RAIN INTENSITY(INCH/HOUR) =  8.47
  TOTAL AREA(ACRES) =     3.00   TOTAL RUNOFF(CFS) =      4.50

****************************************************************************
  FLOW PROCESS FROM NODE    251.00 TO NODE    245.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   795.00  DOWNSTREAM(FEET) =   793.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.72
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.50
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =    6.22
  LONGEST FLOWPATH FROM NODE    258.00 TO NODE    245.00 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    245.00 TO NODE    245.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.22
  RAINFALL INTENSITY(INCH/HR) =   8.01
  TOTAL STREAM AREA(ACRES) =     3.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.50

****************************************************************************
  FLOW PROCESS FROM NODE   2403.00 TO NODE   2402.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1360.00
  DOWNSTREAM ELEVATION(FEET) =   1310.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.212
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.978
  SUBAREA RUNOFF(CFS) =      1.36
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.36

****************************************************************************
  FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1310.00  DOWNSTREAM(FEET) =   1130.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.5902
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.36
  FLOW VELOCITY(FEET/SEC) =   2.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =    6.92
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2401.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.477
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
  SUBAREA AREA(ACRES) =    1.82   SUBAREA RUNOFF(CFS) =    6.26
  TOTAL AREA(ACRES) =        2.2   TOTAL RUNOFF(CFS) =       7.39
  TC(MIN.) =    6.92

****************************************************************************
  FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1130.00  DOWNSTREAM(FEET) =    805.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1315.00   CHANNEL SLOPE =  0.2471
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1790 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.39
  FLOW VELOCITY(FEET/SEC) =   4.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.75   Tc(MIN.) =   11.67
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2400.00 =    1715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.337
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4414
  SUBAREA AREA(ACRES) =   29.06   SUBAREA RUNOFF(CFS) =   68.25
```

```
  TOTAL AREA(ACRES) =       31.2   TOTAL RUNOFF(CFS) =      73.53
  TC(MIN.) =   11.67

****************************************************************************
  FLOW PROCESS FROM NODE   2400.00 TO NODE    245.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   805.00  DOWNSTREAM(FEET) =   793.00
  FLOW LENGTH(FEET) =    55.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.86
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.53
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   11.70
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE    245.00 =    1770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    245.00 TO NODE    245.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.70
  RAINFALL INTENSITY(INCH/HR) =   5.33
  TOTAL STREAM AREA(ACRES) =    31.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     73.53

****************************************************************************
  FLOW PROCESS FROM NODE    250.00 TO NODE    249.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    812.20
  DOWNSTREAM ELEVATION(FEET) =    812.00
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.207
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
```

```
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    249.00 TO NODE    248.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  812.00  DOWNSTREAM ELEVATION(FEET) =  808.20
  STREET LENGTH(FEET) =   230.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.70
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
  STREET FLOW TRAVEL TIME(MIN.) =   1.53   Tc(MIN.) =    4.73
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.23      SUBAREA RUNOFF(CFS) =    1.91
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       2.66

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.19
  FLOW VELOCITY(FEET/SEC.) =  2.76   DEPTH*VELOCITY(FT*FT/SEC.) =   0.86
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    248.00 =     310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    248.00 TO NODE    247.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   802.00  DOWNSTREAM(FEET) =   800.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.66
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    5.01
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    247.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    247.00 TO NODE    246.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    799.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    85.00   CHANNEL SLOPE =  0.0118
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.66
  FLOW VELOCITY(FEET/SEC) =   1.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.71   Tc(MIN.) =    5.72
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    246.00 =     495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    247.00 TO NODE    246.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.454
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5630
  SUBAREA AREA(ACRES) =    0.41   SUBAREA RUNOFF(CFS) =    1.04
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       3.47
  TC(MIN.) =    5.72

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    245.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   799.00  DOWNSTREAM(FEET) =   793.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.03
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.47
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    5.95
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    245.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    245.00 TO NODE    245.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.95
  RAINFALL INTENSITY(INCH/HR) =   8.24
  TOTAL STREAM AREA(ACRES) =     0.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.50     6.22        8.006          3.00
      2       73.53    11.70        5.330         31.21
      3        3.47     5.95        8.241          0.73

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       45.18     5.95       8.241
      2       47.00     6.22       8.006
      3       78.77    11.70       5.330

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      78.77   Tc(MIN.) =   11.70
  TOTAL AREA(ACRES) =       34.9
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE    245.00 =    1770.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       34.9  TC(MIN.) =     11.70
  PEAK FLOW RATE(CFS)   =      78.77
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-24.2

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2422	2421	2	1080	990	100	0.42	0.33				
2421	2420	5	990	815	1025						
2421	2420	8				0.43	7.96				
2420	24.2	3	815	802	140						
							8.29				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 24.2                                                         *
 ************************************************************************

  FILE NAME: P-24-2.DAT
  TIME/DATE OF STUDY: 14:26 11/17/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2422.00 TO NODE   2421.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1080.00
  DOWNSTREAM ELEVATION(FEET) =    990.00
  ELEVATION DIFFERENCE(FEET) =     90.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.682
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.492
  SUBAREA RUNOFF(CFS) =      1.18
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.18

****************************************************************************
  FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.00  DOWNSTREAM(FEET) =    815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.00   CHANNEL SLOPE =  0.1707
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1454 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.18
  FLOW VELOCITY(FEET/SEC) =   2.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.58   Tc(MIN.) =   13.26
  LONGEST FLOWPATH FROM NODE   2422.00 TO NODE   2420.00 =    1125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.916
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4296
  SUBAREA AREA(ACRES) =    7.96   SUBAREA RUNOFF(CFS) =   16.83
  TOTAL AREA(ACRES) =        8.3   TOTAL RUNOFF(CFS) =      17.51
  TC(MIN.) =   13.26
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2420.00 TO NODE     24.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   815.00  DOWNSTREAM(FEET) =   802.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.80
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.51
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   13.39
  LONGEST FLOWPATH FROM NODE   2422.00 TO NODE     24.20 =    1265.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     13.39
  PEAK FLOW RATE(CFS)   =      17.51
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.1.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
1372	1371	2	1315	1313	80	0.52	0.24				
1371	1368	5	1313	1296	570	0.51	1.71				
1368	1364	3	1290	1287	100						
1364	1364	1						1 of 2			
1367	1366	2	1312	1310	80	0.51	0.12				
1366	1365	6	1310	1294	495	0.51	1.08	1 side			
1365	1364	3	1288	1287	30						
1364	1364	1						2 of 2			
1364	1360	3	1287	1279	240						
1360	1360	1						1 of 2			
1363	1362	2	1311	1309	80	0.51	0.10				
1362	1361	6	1309	1289	425	0.51	2.02	2 sides			
1361	1360	3	1283	1279	30						
1360	1360	1						2 of 2			
1360	1356	3	1279	1276	240						
1356	1356	1						1 of 3			
1370	1369	2	1308	1306	50	0.51	0.09				
1369	1359	6	1306	1282	1070	0.51	2.59	1 side			
1359	1356	3	1276.5	1276	25						
1356	1356	1						2 of 3			
1358	1357	2	1290	1288	70	0.51	0.04				
1357	1356	5	1288	1281	400	0.53	0.81				
1356	1356	1						3 of 3			
1356	1353.5	3	1275	1270	55						
1353.5	1353.5	1						1 of 2			
1355	1354	2	1290	1288	70	0.51	0.07				
1354	1353.5	5	1288	1278	400	0.52	1.08				
1353.5	1353.5	1						2 of 2			
1353.5	2296.5	3	1270	1260	1050						
2296.5	2296.5	1						1 of 2			
2299	2298	2	1273	1271	80	0.51	0.12				
2298	2297	6	1271	1269	215	0.51	0.44	1 SIDE			
2297	2296.5	3	1263	1260	50						
2296.5	2296.5	1						2 of 2			

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.1.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2296.5	2296	3	1260	1258	75						
2296	2296	1						1 of 2			
2295	2294	2	1272	1270	80	0.51	0.10				
2294	2293	6	1270	1265	225	0.51	0.53	1 SIDE			
2293	2296	3	1259	1258	40						
2296	2296	1						2 OF 2			
2296	2292	3	1258	1257	90						
2292	2292	10						SAVE TO BANK 1- 2292			
2498	2497	2	1295	1292	95	0.57	0.15				
2497	2496	5	1292	1291	175	0.57	1.51				
2496	2495	3	1285	1279	230						
2495	2495	1						1 OF 2			
2491	2490	2	1288	1286	80	0.54	0.11				
2490	2495	6	1286	1285	80	0.51	0.33	1 SIDE			
2495	2495	1						2 OF 2			
2495	2495.8	3	1279	1265	535						
2495.8	2495.8	1						1 OF 2			
2291	2290	2	1277	1276	65.00	0.51	0.11				
2290	2289	6	1276	1268	220	0.51	0.58	1 SIDE			
2289	2495.8	3	1268	1265	110						
2495.8	2495.8	1						2 OF 2			
2495.8	2288	3	1265	1263	110						
2288	2288	1						1 OF 2			
2287	2286	2	1277	1276	66.67	0.51	0.08				
2286	2285	6	1276	1269	230	0.51	0.58	1 SIDE			
2285	2288	3	1263	1260	40						
2288	2288	1						2 OF 2			
2288	2292	3	1260	1257	150						
2292	2292	11						ADD BANK 1 - 2292			
2292	2292	12						CLEAR BANK 1			
2292	2284	3	1257	1252	325						
2284	2284	1						1 OF 2			
2283	2282	2	1375	1350	100	0.25	0.32				
2282	2284	5	1350	1348	420	0.25	4.16				
2284	2284	1						2 OF 2			

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.1.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2284	2281	3	1252	1234	205						
2281	2281	1						1 OF 2			
2281	2281	7	Q=55.70		A=21.0	T_c=15.35		ADD RUN 25.2			
2281	2281	1						2 OF 2			
2281	2222	3	1234	1115	400						
2222	2222	10						SAVE TO BANK 1 - 2222			
2221	2220	2	1430	1403	100	0.35	0.87				
2220	2219	5	1403	1225	770	0.35	16.08				
2219	2219	10						SAVE TO BANK 2 - 2219			
2231	2230	2	1314	1310	95.00	0.57	0.17				
2230	2229	6	1310	1300	385	0.57	2.33	1 Side			
2229	2229.8	3	1294	1293	105						
2229	2229.8	8				0.57	0.47				
2229.8	2215	3	1293	1291	235						
2215	2215	1						1 of 3			
2218	2217	2	1344	1342	80	0.88	0.15				
2217	2216	6	1342	1321	410	0.55	0.82	1 SIDE			
2216	2215	3	1315	1291	340						
2215	2215	1						2 of 3			
2214	2213	2	1321	1315	97.50	0.57	0.26				
2213	2215	6	1315	1305	225	0.57	0.54	1 SIDE			
2215	2215	1						3 of 3			
2215	2212	3	1291	1287	50						
2212	2219	5	1287	1225	270		*				
2219	2219	11						ADD BANK 2 - 2219			
2219	2219	12						CLEAR BANK 2			
2219	2222	5	1225	1115	500	0.35	6.26				
2222	2222	11						ADD BANK 1- 2222			
2222	2222	12						CLEAR BANK 1			
2222	2209	5	1115	960	1140	0.35	30.46				
2209	2208.8	3	954	942	140						
2208.8	2208.8	1						1 of 2			
2203	2202	2	1210	1165	100	0.25	0.27				
2202	2201	5	1165	945	665	0.25	6.32				
2201	2208.8	3	945	942	225						

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.1.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2208.8	2208.8	1						2 of 2			
2208.8	2208	3	942	924	110						
2208	2208	1						1 of 2			
2207	2206	2	1420	1385	100	0.35	0.44				
2206	2205	5	1385	945	1065	0.35	5.54				
2205	2208	3	939	924	55						
2208	2208	1						2 OF 2			
2208	2201.1	3	924	910	520						
2201.1	2201.1	1						1 of 2			
2201.2	2201.3	2	1200	1160	95	0.35	0.19				
2201.3	2201.4	5	1160	943	600	0.35	7.87				
2201.4	2201.1	3	937	910	165						
2201.1	2201.1	1						2 OF 2			
2201.1	2200.9	3	910	908	180						
2200.9	2200.9	1						1 of 2			
2199.6	2199.5	2	1600	1584	100	0.35	0.14				
2199.5	2199.8	5	1584	1118	1000	0.35	20.46				
2199.8	2199.7	5	1118	918	1355	0.32	53.29				
2199.7	2200.9	3	912	908	105						
2200.9	2200.9	1						2 of 2			
							172.00				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - BASIN 25 - SUBBASIN 25.1                             *
* RESULTS TO BE INSERTED AS CODE 7 INTO RUN 25                          *
*                                                                       *
 *************************************************************************

  FILE NAME: P-25-1.DAT
  TIME/DATE OF STUDY: 10:27 02/15/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1372.00 TO NODE   1371.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1315.00
  DOWNSTREAM ELEVATION(FEET) =   1313.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.880
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.506
  SUBAREA RUNOFF(CFS) =      0.94
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.94

****************************************************************************
  FLOW PROCESS FROM NODE   1371.00 TO NODE   1368.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1313.00  DOWNSTREAM(FEET) =   1296.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   570.00   CHANNEL SLOPE =  0.0298
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.020
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.39
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.81
  Tc(MIN.) =    9.69
  SUBAREA AREA(ACRES) =     1.71       SUBAREA RUNOFF(CFS) =    5.25
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.511
  TOTAL AREA(ACRES) =        2.0         PEAK FLOW RATE(CFS) =       6.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   3.95
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1368.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1368.00 TO NODE   1364.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1290.00  DOWNSTREAM(FEET) =  1287.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.89
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.00
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    9.87
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1364.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1364.00 TO NODE   1364.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.87
  RAINFALL INTENSITY(INCH/HR) =   5.95
  TOTAL STREAM AREA(ACRES) =     1.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.00

****************************************************************************
  FLOW PROCESS FROM NODE   1367.00 TO NODE   1366.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1312.00
  DOWNSTREAM ELEVATION(FEET) =   1310.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
  FLOW PROCESS FROM NODE   1366.00 TO NODE   1365.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1310.00  DOWNSTREAM ELEVATION(FEET) = 1294.00
```

```
  STREET LENGTH(FEET) =   495.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.18
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
  STREET FLOW TRAVEL TIME(MIN.) =   2.43   Tc(MIN.) =    9.42
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.127
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.08      SUBAREA RUNOFF(CFS) =    3.37
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       3.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.24
  FLOW VELOCITY(FEET/SEC.) =  3.86   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE   1367.00 TO NODE   1365.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1365.00 TO NODE   1364.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1288.00  DOWNSTREAM(FEET) =  1287.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.11
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.75
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.49
  LONGEST FLOWPATH FROM NODE   1367.00 TO NODE   1364.00 =     605.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1364.00 TO NODE   1364.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.49
  RAINFALL INTENSITY(INCH/HR) =   6.10
  TOTAL STREAM AREA(ACRES) =     1.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.00     9.87        5.946          1.95
      2        3.75     9.49        6.101          1.20

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.52     9.49       6.101
      2        9.66     9.87       5.946

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.66   Tc(MIN.) =    9.87
  TOTAL AREA(ACRES) =        3.2
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1364.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1364.00 TO NODE   1360.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1287.00  DOWNSTREAM(FEET) =  1279.00
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.45
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.66
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   10.26
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1360.00 =     990.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1360.00 TO NODE   1360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.26
  RAINFALL INTENSITY(INCH/HR) =   5.80
  TOTAL STREAM AREA(ACRES) =     3.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.66

****************************************************************************
  FLOW PROCESS FROM NODE   1363.00 TO NODE   1362.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1311.00
  DOWNSTREAM ELEVATION(FEET) =   1309.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   1362.00 TO NODE   1361.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1309.00  DOWNSTREAM ELEVATION(FEET) = 1289.00
  STREET LENGTH(FEET) =   425.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    5.98
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =    8.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.389
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    2.02      SUBAREA RUNOFF(CFS) =    6.58
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       6.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.17
  FLOW VELOCITY(FEET/SEC.) =  4.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
  LONGEST FLOWPATH FROM NODE   1363.00 TO NODE   1361.00 =     505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1361.00 TO NODE   1360.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1283.00  DOWNSTREAM(FEET) =  1279.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.84
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.91
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    8.86
  LONGEST FLOWPATH FROM NODE   1363.00 TO NODE   1360.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1360.00 TO NODE   1360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.86
  RAINFALL INTENSITY(INCH/HR) =   6.37
  TOTAL STREAM AREA(ACRES) =     2.12
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.66    10.26        5.802          3.15
      2        6.91     8.86        6.374          2.12

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.70     8.86       6.374
      2       15.94    10.26       5.802

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.94   Tc(MIN.) =   10.26
  TOTAL AREA(ACRES) =        5.3
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1360.00 =     990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1360.00 TO NODE   1356.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1279.00  DOWNSTREAM(FEET) =  1276.00
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.95
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.94
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   10.76
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1356.00 =    1230.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1356.00 TO NODE   1356.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.76
  RAINFALL INTENSITY(INCH/HR) =   5.63
  TOTAL STREAM AREA(ACRES) =     5.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.94
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1370.00 TO NODE   1369.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1308.00
  DOWNSTREAM ELEVATION(FEET) =   1306.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.731
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE   1369.00 TO NODE   1359.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1306.00  DOWNSTREAM ELEVATION(FEET) = 1282.00
  STREET LENGTH(FEET) =  1070.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
  STREET FLOW TRAVEL TIME(MIN.) =   5.10   Tc(MIN.) =    9.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.962
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    2.59      SUBAREA RUNOFF(CFS) =    7.88
  TOTAL AREA(ACRES) =        2.7        PEAK FLOW RATE(CFS) =       8.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.78
  FLOW VELOCITY(FEET/SEC.) =  4.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.62
  LONGEST FLOWPATH FROM NODE   1370.00 TO NODE   1359.00 =    1120.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1359.00 TO NODE   1356.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1276.50  DOWNSTREAM(FEET) =  1276.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.26
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.15
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    9.88
  LONGEST FLOWPATH FROM NODE   1370.00 TO NODE   1356.00 =    1145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1356.00 TO NODE   1356.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.88
  RAINFALL INTENSITY(INCH/HR) =   5.94
  TOTAL STREAM AREA(ACRES) =     2.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.15

****************************************************************************
  FLOW PROCESS FROM NODE   1358.00 TO NODE   1357.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1290.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1288.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.262
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.976
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE   1357.00 TO NODE   1356.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1288.00  DOWNSTREAM(FEET) =   1281.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.0175
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.118
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.09
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =    9.45
  SUBAREA AREA(ACRES) =     0.81       SUBAREA RUNOFF(CFS) =    2.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.529
  TOTAL AREA(ACRES) =        0.9         PEAK FLOW RATE(CFS) =       2.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   2.60
  LONGEST FLOWPATH FROM NODE   1358.00 TO NODE   1356.00 =     470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1356.00 TO NODE   1356.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.45
  RAINFALL INTENSITY(INCH/HR) =   6.12
  TOTAL STREAM AREA(ACRES) =     0.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)	(ACRE)
1	15.94	10.76	5.625	5.27
2	8.15	9.88	5.943	2.68
3	2.75	9.45	6.118	0.85

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	25.20	9.45	6.118
2	25.91	9.88	5.943
3	26.19	10.76	5.625

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 26.19 Tc(MIN.) = 10.76
TOTAL AREA(ACRES) = 8.8
LONGEST FLOWPATH FROM NODE 1372.00 TO NODE 1356.00 = 1230.00 FEET.

****
FLOW PROCESS FROM NODE 1356.00 TO NODE 1353.50 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1275.00 DOWNSTREAM(FEET) = 1270.00
FLOW LENGTH(FEET) = 55.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 19.16
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 26.19
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 10.81
LONGEST FLOWPATH FROM NODE 1372.00 TO NODE 1353.50 = 1285.00 FEET.

****
FLOW PROCESS FROM NODE 1353.50 TO NODE 1353.50 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 10.81
RAINFALL INTENSITY(INCH/HR) = 5.61
TOTAL STREAM AREA(ACRES) = 8.80
PEAK FLOW RATE(CFS) AT CONFLUENCE = 26.19

****

```
 FLOW PROCESS FROM NODE   1355.00 TO NODE   1354.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =   1290.00
 DOWNSTREAM ELEVATION(FEET) =   1288.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.262
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.976
 SUBAREA RUNOFF(CFS) =      0.28
 TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
 FLOW PROCESS FROM NODE   1354.00 TO NODE   1353.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1288.00  DOWNSTREAM(FEET) =   1278.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.400
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5200
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.62
 AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.55
 Tc(MIN.) =    8.81
 SUBAREA AREA(ACRES) =     1.08       SUBAREA RUNOFF(CFS) =    3.59
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.519
 TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       3.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.24
 LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1353.50 =     470.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1353.50 TO NODE   1353.50 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.81
  RAINFALL INTENSITY(INCH/HR) =   6.40
  TOTAL STREAM AREA(ACRES) =     1.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.82

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.19    10.81        5.609          8.80
      2        3.82     8.81        6.400          1.15

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.77     8.81       6.400
      2       29.54    10.81       5.609

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      29.54   Tc(MIN.) =   10.81
  TOTAL AREA(ACRES) =       10.0
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   1353.50 =    1285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1353.50 TO NODE   2296.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1270.00  DOWNSTREAM(FEET) =  1260.00
  FLOW LENGTH(FEET) =  1050.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.55
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.54
  PIPE TRAVEL TIME(MIN.) =   2.05    Tc(MIN.) =   12.85
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2296.50 =    2335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2296.50 TO NODE   2296.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.85
  RAINFALL INTENSITY(INCH/HR) =   5.02
  TOTAL STREAM AREA(ACRES) =     9.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.54

****************************************************************************
  FLOW PROCESS FROM NODE   2299.00 TO NODE   2298.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1273.00
  DOWNSTREAM ELEVATION(FEET) =   1271.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
  FLOW PROCESS FROM NODE   2298.00 TO NODE   2297.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1271.00  DOWNSTREAM ELEVATION(FEET) = 1269.00
  STREET LENGTH(FEET) =   215.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.18
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.50
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =    8.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.338
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.44      SUBAREA RUNOFF(CFS) =    1.42
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       1.81

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.77
  FLOW VELOCITY(FEET/SEC.) =  2.04   DEPTH*VELOCITY(FT*FT/SEC.) =   0.62
  LONGEST FLOWPATH FROM NODE   2299.00 TO NODE   2297.00 =     295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2297.00 TO NODE   2296.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1260.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.81
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.05
  LONGEST FLOWPATH FROM NODE   2299.00 TO NODE   2296.50 =     345.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2296.50 TO NODE   2296.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.05
  RAINFALL INTENSITY(INCH/HR) =   6.29
  TOTAL STREAM AREA(ACRES) =     0.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.81

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       29.54    12.85        5.015          9.95
      2        1.81     9.05        6.291          0.56
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       25.36     9.05       6.291
      2       30.98    12.85       5.015

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.98   Tc(MIN.) =   12.85
  TOTAL AREA(ACRES) =       10.5
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2296.50 =    2335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2296.50 TO NODE   2296.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1260.00  DOWNSTREAM(FEET) =  1258.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.59
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.98
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   12.95
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2296.00 =    2410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2296.00 TO NODE   2296.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.95
  RAINFALL INTENSITY(INCH/HR) =   4.99
  TOTAL STREAM AREA(ACRES) =    10.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.98

****************************************************************************
  FLOW PROCESS FROM NODE   2295.00 TO NODE   2294.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1272.00
  DOWNSTREAM ELEVATION(FEET) =   1270.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   2294.00 TO NODE   2293.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1270.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   225.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.27
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    5.98
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.66
  STREET FLOW TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =    8.40
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.598
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.53      SUBAREA RUNOFF(CFS) =    1.78
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.78
  FLOW VELOCITY(FEET/SEC.) =  2.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.83
```

```
 LONGEST FLOWPATH FROM NODE   2295.00 TO NODE   2293.00 =     305.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2293.00 TO NODE   2296.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1259.00  DOWNSTREAM(FEET) =  1258.00
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.22
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.12
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.51
 LONGEST FLOWPATH FROM NODE   2295.00 TO NODE   2296.00 =     345.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2296.00 TO NODE   2296.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.51
 RAINFALL INTENSITY(INCH/HR) =   6.54
 TOTAL STREAM AREA(ACRES) =     0.63
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.12

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       30.98    12.95        4.991         10.51
     2        2.12     8.51        6.544          0.63

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       25.74     8.51       6.544
     2       32.60    12.95       4.991

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      32.60   Tc(MIN.) =   12.95
```

```
  TOTAL AREA(ACRES) =       11.1
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2296.00 =    2410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2296.00 TO NODE   2292.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1258.00  DOWNSTREAM(FEET) =  1257.00
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.27
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.60
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   13.12
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2292.00 =    2500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2292.00 TO NODE   2292.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2498.00 TO NODE   2497.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1295.00
  DOWNSTREAM ELEVATION(FEET) =   1292.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE   2497.00 TO NODE   2496.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1292.00  DOWNSTREAM(FEET) =   1291.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   175.00   CHANNEL SLOPE =  0.0057
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.896
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.93
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.51
  Tc(MIN.) =    7.85
  SUBAREA AREA(ACRES) =     1.51       SUBAREA RUNOFF(CFS) =    5.94
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =        1.7         PEAK FLOW RATE(CFS) =       6.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   2.29
  LONGEST FLOWPATH FROM NODE   2498.00 TO NODE   2496.00 =     270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2496.00 TO NODE   2495.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1285.00  DOWNSTREAM(FEET) =  1279.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.63
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.53
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    8.29
  LONGEST FLOWPATH FROM NODE   2498.00 TO NODE   2495.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2495.00 TO NODE   2495.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.29
  RAINFALL INTENSITY(INCH/HR) =   6.66
  TOTAL STREAM AREA(ACRES) =     1.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.53

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2491.00 TO NODE   2490.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5400
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1288.00
  DOWNSTREAM ELEVATION(FEET) =   1286.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.643
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.677
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE   2490.00 TO NODE   2495.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1286.00  DOWNSTREAM ELEVATION(FEET) = 1285.00
  STREET LENGTH(FEET) =    80.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.38
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.51
  STREET FLOW TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =    7.30
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.224
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.518
  SUBAREA AREA(ACRES) =    0.33      SUBAREA RUNOFF(CFS) =    1.22
```

```
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       1.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.91
  FLOW VELOCITY(FEET/SEC.) =  2.21   DEPTH*VELOCITY(FT*FT/SEC.) =   0.63
  LONGEST FLOWPATH FROM NODE   2491.00 TO NODE   2495.00 =     160.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2495.00 TO NODE   2495.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.30
  RAINFALL INTENSITY(INCH/HR) =   7.22
  TOTAL STREAM AREA(ACRES) =     0.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.64

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.53     8.29        6.655          1.66
      2        1.64     7.30        7.224          0.44

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.39     7.30       7.224
      2        8.04     8.29       6.655

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.04   Tc(MIN.) =    8.29
  TOTAL AREA(ACRES) =        2.1
  LONGEST FLOWPATH FROM NODE   2498.00 TO NODE   2495.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2495.00 TO NODE   2495.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1279.00  DOWNSTREAM(FEET) =  1265.00
  FLOW LENGTH(FEET) =   535.00   MANNING'S N =  0.013
```

```
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.04
  PIPE TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE   2498.00 TO NODE   2495.80 =    1035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2495.80 TO NODE   2495.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   6.19
  TOTAL STREAM AREA(ACRES) =     2.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.04

****************************************************************************
  FLOW PROCESS FROM NODE   2291.00 TO NODE   2290.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1277.00
  DOWNSTREAM ELEVATION(FEET) =   1276.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE   2290.00 TO NODE   2289.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1276.00  DOWNSTREAM ELEVATION(FEET) = 1268.00
  STREET LENGTH(FEET) =   220.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =    8.53
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.534
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    1.93
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.30

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.18
  FLOW VELOCITY(FEET/SEC.) =  3.63   DEPTH*VELOCITY(FT*FT/SEC.) =   0.98
  LONGEST FLOWPATH FROM NODE   2291.00 TO NODE   2289.00 =     285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2289.00 TO NODE   2495.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1268.00  DOWNSTREAM(FEET) =  1265.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.57
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.30
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    8.81
  LONGEST FLOWPATH FROM NODE   2291.00 TO NODE   2495.80 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2495.80 TO NODE   2495.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.81
  RAINFALL INTENSITY(INCH/HR) =   6.40
  TOTAL STREAM AREA(ACRES) =     0.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.30

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.04     9.27        6.193          2.10
      2        2.30     8.81        6.400          0.69

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.08     8.81       6.400
      2       10.27     9.27       6.193

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.27   Tc(MIN.) =    9.27
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE   2498.00 TO NODE   2495.80 =    1035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2495.80 TO NODE   2288.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1265.00  DOWNSTREAM(FEET) =  1263.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.27
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    9.49
  LONGEST FLOWPATH FROM NODE   2498.00 TO NODE   2288.00 =    1145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2288.00 TO NODE   2288.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.49
  RAINFALL INTENSITY(INCH/HR) =   6.10
  TOTAL STREAM AREA(ACRES) =     2.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.27

****************************************************************************
  FLOW PROCESS FROM NODE   2287.00 TO NODE   2286.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    66.67
  UPSTREAM ELEVATION(FEET) =   1277.00
  DOWNSTREAM ELEVATION(FEET) =   1276.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.575
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.054
  SUBAREA RUNOFF(CFS) =      0.29
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.29

****************************************************************************
  FLOW PROCESS FROM NODE   2286.00 TO NODE   2285.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1276.00  DOWNSTREAM ELEVATION(FEET) = 1269.00
  STREET LENGTH(FEET) =   230.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.23
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.38
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.71
  STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =    8.84
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.383
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    1.89
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.24
  FLOW VELOCITY(FEET/SEC.) =  3.34   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
  LONGEST FLOWPATH FROM NODE   2287.00 TO NODE   2285.00 =     296.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2285.00 TO NODE   2288.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1260.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.22
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.15
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.92
  LONGEST FLOWPATH FROM NODE   2287.00 TO NODE   2288.00 =     336.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2288.00 TO NODE   2288.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.92
  RAINFALL INTENSITY(INCH/HR) =   6.35
  TOTAL STREAM AREA(ACRES) =     0.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.15

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

1	10.27	9.49	6.101	2.79
2	2.15	8.92	6.350	0.66

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	12.01	8.92	6.350
2	12.33	9.49	6.101

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 12.33 Tc(MIN.) = 9.49
TOTAL AREA(ACRES) = 3.4
LONGEST FLOWPATH FROM NODE 2498.00 TO NODE 2288.00 = 1145.00 FEET.

****
FLOW PROCESS FROM NODE 2288.00 TO NODE 2292.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1260.00 DOWNSTREAM(FEET) = 1257.00
FLOW LENGTH(FEET) = 150.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.99
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 12.33
PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 9.77
LONGEST FLOWPATH FROM NODE 2498.00 TO NODE 2292.00 = 1295.00 FEET.

****
FLOW PROCESS FROM NODE 2292.00 TO NODE 2292.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	12.33	9.77	5.988	3.45

LONGEST FLOWPATH FROM NODE 2498.00 TO NODE 2292.00 = 1295.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	32.60	13.12	4.951	11.14

```
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2292.00 =    2500.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      36.60       9.77        5.988
      2      42.79      13.12        4.951

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.79   Tc(MIN.) =   13.12
  TOTAL AREA(ACRES) =       14.6

****************************************************************************
  FLOW PROCESS FROM NODE   2292.00 TO NODE   2292.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2292.00 TO NODE   2284.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1257.00  DOWNSTREAM(FEET) =  1252.00
  FLOW LENGTH(FEET) =   325.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.11
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.79
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =   13.60
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2284.00 =    2825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2284.00 TO NODE   2284.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.60
  RAINFALL INTENSITY(INCH/HR) =   4.84
  TOTAL STREAM AREA(ACRES) =    14.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.79

****************************************************************************
  FLOW PROCESS FROM NODE   2283.00 TO NODE   2282.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1375.00
  DOWNSTREAM ELEVATION(FEET) =   1350.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      0.59

******************************************************************************
  FLOW PROCESS FROM NODE   2282.00 TO NODE   2284.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1348.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   420.00   CHANNEL SLOPE =  0.0048
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.104
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.94
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =    9.48
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =    6.35
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =       6.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   3.55
  LONGEST FLOWPATH FROM NODE   2283.00 TO NODE   2284.00 =     520.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2284.00 TO NODE   2284.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.48
  RAINFALL INTENSITY(INCH/HR) =   6.10
  TOTAL STREAM AREA(ACRES) =     4.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.84

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       42.79    13.60        4.836         14.59
      2        6.84     9.48        6.104          4.48

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       36.65     9.48       6.104
      2       48.21    13.60       4.836

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      48.21   Tc(MIN.) =   13.60
  TOTAL AREA(ACRES) =       19.1
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2284.00 =    2825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2284.00 TO NODE   2281.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1252.00  DOWNSTREAM(FEET) =  1234.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.26
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.21
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   13.76
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2281.00 =    3030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2281.00 TO NODE   2281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   13.76
  RAINFALL INTENSITY(INCH/HR) =   4.80
  TOTAL STREAM AREA(ACRES) =    19.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     48.21

****************************************************************************
  FLOW PROCESS FROM NODE   2281.00 TO NODE   2281.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  15.35   RAIN INTENSITY(INCH/HOUR) =  4.47
  TOTAL AREA(ACRES) =    21.00   TOTAL RUNOFF(CFS) =     55.70

****************************************************************************
  FLOW PROCESS FROM NODE   2281.00 TO NODE   2281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.35
  RAINFALL INTENSITY(INCH/HR) =   4.47
  TOTAL STREAM AREA(ACRES) =    21.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     55.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       48.21    13.76        4.801         19.07
      2       55.70    15.35        4.473         21.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       98.12    13.76       4.801
      2      100.62    15.35       4.473

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     100.62   Tc(MIN.) =   15.35
  TOTAL AREA(ACRES) =       40.1
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2281.00 =    3030.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2281.00 TO NODE   2222.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1234.00  DOWNSTREAM(FEET) =  1115.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  41.90
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     100.62
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   15.51
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2222.00 =    3430.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2222.00 TO NODE   2222.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1430.00
  DOWNSTREAM ELEVATION(FEET) =   1403.00
  ELEVATION DIFFERENCE(FEET) =     27.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      2.43
  TOTAL AREA(ACRES) =      0.87   TOTAL RUNOFF(CFS) =      2.43

****************************************************************************
  FLOW PROCESS FROM NODE   2220.00 TO NODE   2219.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1403.00  DOWNSTREAM(FEET) =   1225.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   770.00   CHANNEL SLOPE =  0.2312
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.481
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.79
 AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   0.65
 Tc(MIN.) =    6.92
 SUBAREA AREA(ACRES) =    16.08       SUBAREA RUNOFF(CFS) =   42.10
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =       17.0         PEAK FLOW RATE(CFS) =      44.38

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =  24.08
 LONGEST FLOWPATH FROM NODE   2221.00 TO NODE   2219.00 =     870.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2219.00 TO NODE   2219.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =   1314.00
 DOWNSTREAM ELEVATION(FEET) =   1310.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.759
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.419
 SUBAREA RUNOFF(CFS) =      0.82
 TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.82

****************************************************************************
 FLOW PROCESS FROM NODE   2230.00 TO NODE   2229.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1310.00  DOWNSTREAM ELEVATION(FEET) = 1300.00
 STREET LENGTH(FEET) =   385.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.39
  STREET FLOW TRAVEL TIME(MIN.) =   1.65   Tc(MIN.) =    7.40
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.158
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    2.33      SUBAREA RUNOFF(CFS) =    9.51
  TOTAL AREA(ACRES) =        2.5        PEAK FLOW RATE(CFS) =      10.20

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.66
  FLOW VELOCITY(FEET/SEC.) =  4.50   DEPTH*VELOCITY(FT*FT/SEC.) =   1.89
  LONGEST FLOWPATH FROM NODE   2231.00 TO NODE   2229.00 =     480.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2229.00 TO NODE   2229.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1294.00  DOWNSTREAM(FEET) =  1293.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.20
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    7.67
  LONGEST FLOWPATH FROM NODE   2231.00 TO NODE   2229.80 =     585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2229.00 TO NODE   2229.80 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.998
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5700
  SUBAREA AREA(ACRES) =    0.47   SUBAREA RUNOFF(CFS) =    1.87
  TOTAL AREA(ACRES) =        3.0   TOTAL RUNOFF(CFS) =      11.85
  TC(MIN.) =    7.67

****************************************************************************
  FLOW PROCESS FROM NODE   2229.80 TO NODE   2215.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1293.00  DOWNSTREAM(FEET) =  1291.00
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.48
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.85
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =    8.27
  LONGEST FLOWPATH FROM NODE   2231.00 TO NODE   2215.00 =     820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2215.00 TO NODE   2215.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.27
  RAINFALL INTENSITY(INCH/HR) =   6.66
  TOTAL STREAM AREA(ACRES) =     2.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.85

****************************************************************************
  FLOW PROCESS FROM NODE   2218.00 TO NODE   2217.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1344.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1342.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.610
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.22
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      1.22

****************************************************************************
  FLOW PROCESS FROM NODE   2217.00 TO NODE   2216.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1342.00  DOWNSTREAM ELEVATION(FEET) = 1321.00
  STREET LENGTH(FEET) =   410.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.27
  STREET FLOW TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =    4.13
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.601
  SUBAREA AREA(ACRES) =    0.82      SUBAREA RUNOFF(CFS) =    4.16
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       5.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.77
  FLOW VELOCITY(FEET/SEC.) =  5.01   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2216.00 =     490.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2216.00 TO NODE   2215.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1315.00  DOWNSTREAM(FEET) =  1291.00
  FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.75
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.38
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =    4.61
  LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2215.00 =     830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2215.00 TO NODE   2215.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.61
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.38

****************************************************************************
  FLOW PROCESS FROM NODE   2214.00 TO NODE   2213.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.50
  UPSTREAM ELEVATION(FEET) =   1321.00
  DOWNSTREAM ELEVATION(FEET) =   1315.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.141
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.058
  SUBAREA RUNOFF(CFS) =      1.34
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      1.34

****************************************************************************
  FLOW PROCESS FROM NODE   2213.00 TO NODE   2215.00 IS CODE =  62
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1315.00  DOWNSTREAM ELEVATION(FEET) = 1305.00
  STREET LENGTH(FEET) =   225.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.60
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.24
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
  STREET FLOW TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =    6.07
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.138
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.54      SUBAREA RUNOFF(CFS) =    2.50
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       3.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.57
  FLOW VELOCITY(FEET/SEC.) =  4.35   DEPTH*VELOCITY(FT*FT/SEC.) =   1.30
  LONGEST FLOWPATH FROM NODE   2214.00 TO NODE   2215.00 =     322.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2215.00 TO NODE   2215.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.07
  RAINFALL INTENSITY(INCH/HR) =   8.14
  TOTAL STREAM AREA(ACRES) =     0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.71
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.85     8.27        6.663          2.97
      2        5.38     4.61        9.222          0.97
      3        3.71     6.07        8.138          0.80

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       14.80     4.61       9.222
      2       17.14     6.07       8.138
      3       18.77     8.27       6.663

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.77   Tc(MIN.) =    8.27
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2215.00 =     830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2215.00 TO NODE   2212.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1291.00  DOWNSTREAM(FEET) =  1287.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.77
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.32
  LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2212.00 =     880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2212.00 TO NODE   2219.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1287.00  DOWNSTREAM(FEET) =   1225.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE =  0.2296
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      18.77
```

```
 FLOW VELOCITY(FEET/SEC) =   9.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.48   Tc(MIN.) =    8.81
 LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2219.00 =    1150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2219.00 TO NODE   2219.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       18.77     8.81       6.401        4.74
 LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2219.00 =    1150.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       44.38     6.92       7.481       16.95
 LONGEST FLOWPATH FROM NODE   2221.00 TO NODE   2219.00 =     870.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      59.12       6.92        7.481
     2      56.74       8.81        6.401

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      59.12   Tc(MIN.) =    6.92
 TOTAL AREA(ACRES) =       21.7

****************************************************************************
 FLOW PROCESS FROM NODE   2219.00 TO NODE   2219.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2219.00 TO NODE   2222.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1225.00  DOWNSTREAM(FEET) =   1115.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00   CHANNEL SLOPE =  0.2200
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.271
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  26.74
 AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   0.31
 Tc(MIN.) =    7.23
 SUBAREA AREA(ACRES) =     6.26       SUBAREA RUNOFF(CFS) =   15.93
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.388
 TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      78.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =  28.16
 LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2222.00 =    1650.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2222.00 TO NODE   2222.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       78.93     7.23       7.271       27.95
 LONGEST FLOWPATH FROM NODE   2218.00 TO NODE   2222.00 =    1650.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      100.62    15.51       4.443       40.07
 LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2222.00 =    3430.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     125.82       7.23        7.271
     2     148.85      15.51        4.443

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     148.85   Tc(MIN.) =   15.51
 TOTAL AREA(ACRES) =       68.0

****************************************************************************
 FLOW PROCESS FROM NODE   2222.00 TO NODE   2222.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
```

```
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE   2222.00 TO NODE   2209.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.00  DOWNSTREAM(FEET) =    960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1140.00   CHANNEL SLOPE =  0.1360
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.257
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     171.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.82
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   1.07
  Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =    30.46       SUBAREA RUNOFF(CFS) =   45.38
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.433
  TOTAL AREA(ACRES) =       98.5         PEAK FLOW RATE(CFS) =     181.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =  18.06
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2209.00 =    4570.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2209.00 TO NODE   2208.80 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   954.00  DOWNSTREAM(FEET) =   942.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.87
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     181.60
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   16.65
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2208.80 =    4710.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2208.80 TO NODE   2208.80 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.65
  RAINFALL INTENSITY(INCH/HR) =   4.24
  TOTAL STREAM AREA(ACRES) =    98.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    181.60

****************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1210.00
  DOWNSTREAM ELEVATION(FEET) =   1165.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1165.00  DOWNSTREAM(FEET) =    945.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.00   CHANNEL SLOPE =  0.3308
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.615
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.76
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   1.27
  Tc(MIN.) =    8.37
  SUBAREA AREA(ACRES) =     6.32       SUBAREA RUNOFF(CFS) =   10.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        6.6         PEAK FLOW RATE(CFS) =      10.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
 DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =  10.96
 LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2201.00 =     765.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2201.00 TO NODE   2208.80 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   945.00  DOWNSTREAM(FEET) =   942.00
 FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.41
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.90
 PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    8.87
 LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2208.80 =     990.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2208.80 TO NODE   2208.80 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.87
 RAINFALL INTENSITY(INCH/HR) =   6.37
 TOTAL STREAM AREA(ACRES) =     6.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.90

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      181.60    16.65        4.244         98.48
     2       10.90     8.87        6.369          6.59

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      107.67     8.87       6.369
     2      188.87    16.65       4.244

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     188.87   Tc(MIN.) =   16.65
```

```
  TOTAL AREA(ACRES) =      105.1
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2208.80 =    4710.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2208.80 TO NODE   2208.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   942.00  DOWNSTREAM(FEET) =   924.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.81
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     188.87
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   16.70
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2208.00 =    4820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2208.00 TO NODE   2208.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.70
  RAINFALL INTENSITY(INCH/HR) =   4.24
  TOTAL STREAM AREA(ACRES) =   105.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    188.87

****************************************************************************
  FLOW PROCESS FROM NODE   2207.00 TO NODE   2206.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1420.00
  DOWNSTREAM ELEVATION(FEET) =   1385.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      1.23
  TOTAL AREA(ACRES) =      0.44   TOTAL RUNOFF(CFS) =      1.23
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2206.00 TO NODE   2205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.00  DOWNSTREAM(FEET) =    945.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1065.00   CHANNEL SLOPE =  0.4131
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.836
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.52
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   1.69
  Tc(MIN.) =    7.95
  SUBAREA AREA(ACRES) =     5.54       SUBAREA RUNOFF(CFS) =   13.25
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      14.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =  12.84
  LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2205.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2205.00 TO NODE   2208.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   939.00  DOWNSTREAM(FEET) =   924.00
  FLOW LENGTH(FEET) =    55.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.13
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.31
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.99
  LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2208.00 =    1220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2208.00 TO NODE   2208.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.99
  RAINFALL INTENSITY(INCH/HR) =   6.82
  TOTAL STREAM AREA(ACRES) =     5.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.31

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      188.87    16.70        4.236        105.07
      2       14.31     7.99        6.816          5.98

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      131.69     7.99       6.816
      2      197.76    16.70       4.236

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     197.76   Tc(MIN.) =   16.70
  TOTAL AREA(ACRES) =      111.1
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2208.00 =    4820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2208.00 TO NODE   2201.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   924.00  DOWNSTREAM(FEET) =   910.00
  FLOW LENGTH(FEET) =   520.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  35.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.09
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     197.76
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   17.13
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2201.10 =    5340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2201.10 TO NODE   2201.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.13
  RAINFALL INTENSITY(INCH/HR) =   4.17
  TOTAL STREAM AREA(ACRES) =   111.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    197.76

****************************************************************************
  FLOW PROCESS FROM NODE   2201.20 TO NODE   2201.30 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1200.00
  DOWNSTREAM ELEVATION(FEET) =   1160.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.108
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.105
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE   2201.30 TO NODE   2201.40 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =    943.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.3617
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.422
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.20
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   0.89
  Tc(MIN.) =    7.00
  SUBAREA AREA(ACRES) =     7.87       SUBAREA RUNOFF(CFS) =   20.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        8.1         PEAK FLOW RATE(CFS) =      20.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =  13.79
```

```
 LONGEST FLOWPATH FROM NODE   2201.20 TO NODE   2201.40 =     695.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2201.40 TO NODE   2201.10 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   937.00  DOWNSTREAM(FEET) =   910.00
 FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.03
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      20.94
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    7.12
 LONGEST FLOWPATH FROM NODE   2201.20 TO NODE   2201.10 =     860.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2201.10 TO NODE   2201.10 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.12
 RAINFALL INTENSITY(INCH/HR) =   7.34
 TOTAL STREAM AREA(ACRES) =     8.06
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.94

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      197.76    17.13        4.167        111.05
     2       20.94     7.12        7.341          8.06

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      133.19     7.12       7.341
     2      209.64    17.13       4.167

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     209.64   Tc(MIN.) =   17.13
```

```
  TOTAL AREA(ACRES) =      119.1
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2201.10 =    5340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2201.10 TO NODE   2200.90 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   910.00  DOWNSTREAM(FEET) =   908.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  43.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.55
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     209.64
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   17.34
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2200.90 =    5520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2200.90 TO NODE   2200.90 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.34
  RAINFALL INTENSITY(INCH/HR) =   4.14
  TOTAL STREAM AREA(ACRES) =   119.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    209.64

****************************************************************************
  FLOW PROCESS FROM NODE   2199.60 TO NODE   2199.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1600.00
  DOWNSTREAM ELEVATION(FEET) =   1584.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.39
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2199.50 TO NODE   2199.80 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1584.00  DOWNSTREAM(FEET) =   1118.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1000.00   CHANNEL SLOPE =  0.4660
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.228
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.21
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.03
  Tc(MIN.) =    7.29
  SUBAREA AREA(ACRES) =    20.46       SUBAREA RUNOFF(CFS) =   51.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       20.6         PEAK FLOW RATE(CFS) =      52.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =  20.03
  LONGEST FLOWPATH FROM NODE   2199.60 TO NODE   2199.80 =    1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2199.80 TO NODE   2199.70 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1118.00  DOWNSTREAM(FEET) =    918.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1355.00   CHANNEL SLOPE =  0.1476
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.457
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     107.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.21
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   1.39
  Tc(MIN.) =    8.69
  SUBAREA AREA(ACRES) =    53.29       SUBAREA RUNOFF(CFS) =  110.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.328
  TOTAL AREA(ACRES) =       73.9         PEAK FLOW RATE(CFS) =     156.67
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =  17.95
  LONGEST FLOWPATH FROM NODE   2199.60 TO NODE   2199.70 =    2455.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2199.70 TO NODE   2200.90 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   912.00  DOWNSTREAM(FEET) =   908.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.70
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     156.67
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.77
  LONGEST FLOWPATH FROM NODE   2199.60 TO NODE   2200.90 =    2560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2200.90 TO NODE   2200.90 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.77
  RAINFALL INTENSITY(INCH/HR) =   6.42
  TOTAL STREAM AREA(ACRES) =    73.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    156.67

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      209.64    17.34        4.135        119.11
      2      156.67     8.77        6.419         73.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      291.72     8.77       6.419
      2      310.57    17.34       4.135

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =     310.57   Tc(MIN.) =   17.34
  TOTAL AREA(ACRES) =      193.0
  LONGEST FLOWPATH FROM NODE   1372.00 TO NODE   2200.90 =    5520.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      193.0  TC(MIN.) =     17.34
  PEAK FLOW RATE(CFS)   =     310.57
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.2.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2494	2493	2	1294	1292	80	0.57	0.13				
2493	2272	6	1294	1284.5	245	0.57	0.93	1 side			
2272	2272	1						1 of 2			
2280	2279	2	1287	1286	65	0.51	0.11				
2279	2278	6	1286	1285	145	0.51	0.62	2 SIDES			
2278	2272	3	1279	1278.5	55						
2272	2272	1						2 of 2			
2272	2277	3	1278.5	1269	280						
2277	2277	1						1 of 3			
2272.8	2272.6	2	1286	1284	81	0.51	0.12				
2272.6	2277	6	1284	1275	225	0.51	1.11	1 side			
2277	2277	1						2 of 3			
2276	2275	2	1284	1282	85	0.51	0.05				
2275	2274	6	1282	1278	180	0.51	0.98				
2274	2277	3	1272	1269	100						
2277	2277	1						3 of 3			
2277	2271	3	1269	1259	440						
2271	2271	1						1 of 2			
2271.2	2271.3	2	1272	1271	65	0.51	0.12				
2271.3	2271.4	6	1271	1265	210	0.51	0.65	2 SIDES			
2271.4	2271	3	1259	1258	50						
2271	2271	1						2 OF 2			
2271	2271	10						Save to Bank 1			
2250.2	2241	2	1300	1295	90	0.57	0.10				
2241	2240	6	1295	1284	525	0.54	1.78	2 sides			
2240	2236	3	1278	1277	690						
2236	2236	1						1 of 2			
2238	2237	2	1295	1292	95	0.51	0.15				
2237	2236	6	1292	1283	295	0.51	1.09	2 sides			
2236	2236	1						2 of 2			
2236	2235	3	1277	1276	240						
2235	2235	1						1 of 2			
2234	2233	2	1284	1283	65	0.51	0.11				
2233	2235	6	1283	1282	95	0.51	0.55	2 SIDES			

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.2.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2235	2235	1						2 of 2			
2235	2232	3	1276	1274	55						
2232	2232	1						1 of 2			
2227	2226	2	1296	1295	65	0.57	0.11				
2226	2232	6	1295	1274	495	0.57	2.70	1 side			
2232	2232	1						2 of 2			
2232	2268.8	3	1274	1267	245						
2268.8	2268.8	1						1 of 2			
2270	2269	2	1278	1276	83.33	0.51	0.10				
2269	2268	6	1276	1275	110	0.51	0.77	2 SIDES			
2268	2268.8	3	1269	1267	105						
2268.8	2268.8	1						2 of 2			
2268.8	2267	3	1267	1262	165						
2267	2267	1						1 of 3			
2266	2265	2	1280	1275	85	0.51	0.13				
2265	2267	6	1275	1270	350	0.51	1.26	1 side			
2267	2267	1						2 of 3			
2264	2263	2	1274	1272	81.58	0.51	0.10				
2263	2262	6	1272	1271	125	0.51	0.35	1 SIDE			
2262	2267	3	1265	1264	65						
2267	2267	1						3 of 3			
2267	2271	3	1264	1258	280						
2271	2271	11						Add Bank 1			
2271	2271	12						Clear Bank 1			
2271	2261	3	1258	1257.5	10						
2261	2261	1						1 of 3			
2260	2259	2	1278	1276	80	0.51	0.13				
2259	2261	6	1276	1263.5	370	0.51	1.67	1 side			
2261	2261	1						2 of 3			
2258	2257	2	1271	1269	80	0.51	0.14				
2257	2261	6	1269	1263.5	250	0.51	0.89	1 side			
2261	2261	1						3 of 3			
2261	2256	3	1257.5	1244	170						

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25.2.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2256	2256	1						1 OF 2			
2255	2254	2	1275	1274	65	0.51	0.20				
2254	2253	6	1274	1267	295	0.51	0.54	1 SIDE			
2253	2256	3	1261	1244	340						
2256	2256	1						2 OF 2			
2256	2252	3	1244	1243	125						
2252	2252	1						1 OF 3			
2251	2250	2	1266	1261	95	0.51	0.18				
2250	2252	6	1261	1249	350	0.51	0.70	1 SIDE			
2252	2252	1						2 OF 3			
2250.2	2250.4	2	1270	1265	75	0.57	0.19				
2250.4	2252	6	1265	1249	455	0.57	1.01	1 SIDE			
2252	2252	1						3 OF 3			
2252	2252	10						SAVE TO BANK 1			
2249	2248	2	1320	1314	100	0.57	0.22				
2248	2247	6	1314	1306	100	0.57	0.20	1 SIDE			
2247	2246	3	1300	1264	440						
2246	2246	1						1 OF 2			
2245	2244	2	1294	1289	100	0.57	0.19				
2244	2246	6	1289	1270	330	0.57	0.57	1 SIDE			
2246	2246	1						2 OF 2			
2246	2252	3	1264	1243	525						
2252	2252	11						Add Bank 1			
2252	2252	12						Clear Bank 1			
2252	2223	3	1243	1242	35						
2223	2281	5	1242	1240	205		*				
							20.95				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY - SUBBASIN 25                      *
* RESULTS ARE TO BE ENTERED INTO RUN 25.1 AS A CODE 7 AT NODE 2281       *
*                                                                        *
 ************************************************************************

  FILE NAME: P-25-2.DAT
  TIME/DATE OF STUDY: 10:05 02/15/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2494.00 TO NODE   2493.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1294.00
  DOWNSTREAM ELEVATION(FEET) =   1292.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.955
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
  FLOW PROCESS FROM NODE   2493.00 TO NODE   2272.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1292.00  DOWNSTREAM ELEVATION(FEET) = 1284.50
  STREET LENGTH(FEET) =   245.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
  STREET FLOW TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =    7.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.93      SUBAREA RUNOFF(CFS) =    3.77
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       4.30

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.90
  FLOW VELOCITY(FEET/SEC.) =  3.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2272.00 =     325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2272.00 TO NODE   2272.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.48
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     1.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.30

****************************************************************************
  FLOW PROCESS FROM NODE   2280.00 TO NODE   2279.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1287.00
  DOWNSTREAM ELEVATION(FEET) =   1286.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE   2279.00 TO NODE   2278.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1286.00  DOWNSTREAM ELEVATION(FEET) = 1285.00
  STREET LENGTH(FEET) =   145.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.40
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.25
   HALFSTREET FLOOD WIDTH(FEET) =    5.98
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.36
 STREET FLOW TRAVEL TIME(MIN.) =   1.65   Tc(MIN.) =    9.06
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.283
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
 SUBAREA AREA(ACRES) =    0.62      SUBAREA RUNOFF(CFS) =    1.99
 TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.34

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.71
 FLOW VELOCITY(FEET/SEC.) =  1.64   DEPTH*VELOCITY(FT*FT/SEC.) =   0.46
 LONGEST FLOWPATH FROM NODE   2280.00 TO NODE   2278.00 =     210.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2278.00 TO NODE   2272.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1279.00  DOWNSTREAM(FEET) =  1278.50
 FLOW LENGTH(FEET) =    55.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.45
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.34
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    9.27
 LONGEST FLOWPATH FROM NODE   2280.00 TO NODE   2272.00 =     265.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2272.00 TO NODE   2272.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   6.19
  TOTAL STREAM AREA(ACRES) =     0.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.34

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.30     7.48        7.114          1.06
      2        2.34     9.27        6.193          0.73

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.19     7.48       7.114
      2        6.08     9.27       6.193

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.19   Tc(MIN.) =    7.48
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2272.00 =     325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2272.00 TO NODE   2277.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1278.50  DOWNSTREAM(FEET) =  1269.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.19
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    7.98
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2277.00 =     605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2277.00 TO NODE   2277.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.98
  RAINFALL INTENSITY(INCH/HR) =   6.82
  TOTAL STREAM AREA(ACRES) =     1.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.19

************************************************************************
  FLOW PROCESS FROM NODE   2272.80 TO NODE   2272.60 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.00
  UPSTREAM ELEVATION(FEET) =   1286.00
  DOWNSTREAM ELEVATION(FEET) =   1284.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.072
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.374
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.45

************************************************************************
  FLOW PROCESS FROM NODE   2272.60 TO NODE   2277.00 IS CODE =  62
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1284.00  DOWNSTREAM ELEVATION(FEET) = 1275.00
  STREET LENGTH(FEET) =   225.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
  STREET FLOW TRAVEL TIME(MIN.) =   0.99   Tc(MIN.) =    8.06
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.778
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.11      SUBAREA RUNOFF(CFS) =    3.84
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       4.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.30
  FLOW VELOCITY(FEET/SEC.) =  4.32   DEPTH*VELOCITY(FT*FT/SEC.) =   1.35
  LONGEST FLOWPATH FROM NODE   2272.80 TO NODE   2277.00 =     306.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2277.00 TO NODE   2277.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.06
  RAINFALL INTENSITY(INCH/HR) =   6.78
  TOTAL STREAM AREA(ACRES) =     1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.25

****************************************************************************
  FLOW PROCESS FROM NODE   2276.00 TO NODE   2275.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1284.00
  DOWNSTREAM ELEVATION(FEET) =   1282.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.362
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.185
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2275.00 TO NODE   2274.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1282.00  DOWNSTREAM ELEVATION(FEET) = 1278.00
 STREET LENGTH(FEET) =   180.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.27
   HALFSTREET FLOOD WIDTH(FEET) =    7.24
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
 STREET FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    8.41
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.592
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
 SUBAREA AREA(ACRES) =    0.98      SUBAREA RUNOFF(CFS) =    3.29
 TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.46

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.70
 FLOW VELOCITY(FEET/SEC.) =  3.27   DEPTH*VELOCITY(FT*FT/SEC.) =   1.05
 LONGEST FLOWPATH FROM NODE   2276.00 TO NODE   2274.00 =     265.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2274.00 TO NODE   2277.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1272.00  DOWNSTREAM(FEET) =  1269.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.63
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.46
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    8.63
  LONGEST FLOWPATH FROM NODE   2276.00 TO NODE   2277.00 =     365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2277.00 TO NODE   2277.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.63
  RAINFALL INTENSITY(INCH/HR) =   6.48
  TOTAL STREAM AREA(ACRES) =     1.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.19     7.98        6.824          1.79
      2        4.25     8.06        6.778          1.23
      3        3.46     8.63        6.484          1.03

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       13.59     7.98       6.824
      2       13.63     8.06       6.778
      3       13.41     8.63       6.484

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.63   Tc(MIN.) =    8.06
  TOTAL AREA(ACRES) =        4.1
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2277.00 =     605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2277.00 TO NODE   2271.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1269.00  DOWNSTREAM(FEET) =  1259.00
```

```
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.63
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.63
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =    8.82
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2271.00 =    1045.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2271.00 TO NODE   2271.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.82
  RAINFALL INTENSITY(INCH/HR) =   6.39
  TOTAL STREAM AREA(ACRES) =     4.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.63

****************************************************************************
  FLOW PROCESS FROM NODE   2271.20 TO NODE   2271.30 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1272.00
  DOWNSTREAM ELEVATION(FEET) =   1271.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE   2271.30 TO NODE   2271.40 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1271.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.51
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    3.99
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.56
  STREET FLOW TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =    8.70
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.449
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    2.14
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       2.53

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.58
  FLOW VELOCITY(FEET/SEC.) =  2.95   DEPTH*VELOCITY(FT*FT/SEC.) =   0.70
  LONGEST FLOWPATH FROM NODE   2271.20 TO NODE   2271.40 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2271.40 TO NODE   2271.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1259.00  DOWNSTREAM(FEET) =  1258.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.53
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    8.84
  LONGEST FLOWPATH FROM NODE   2271.20 TO NODE   2271.00 =     325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2271.00 TO NODE   2271.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.84
  RAINFALL INTENSITY(INCH/HR) =   6.38
  TOTAL STREAM AREA(ACRES) =     0.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.53

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.63     8.82        6.395          4.05
      2        2.53     8.84        6.384          0.77

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.15     8.82       6.395
      2       16.14     8.84       6.384

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.15   Tc(MIN.) =    8.82
  TOTAL AREA(ACRES) =        4.8
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2271.00 =    1045.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2271.00 TO NODE   2271.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2242.00 TO NODE   2241.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1300.00
  DOWNSTREAM ELEVATION(FEET) =   1295.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.110
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.093
SUBAREA RUNOFF(CFS) =      0.52
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1295.00  DOWNSTREAM ELEVATION(FEET) = 1284.00
STREET LENGTH(FEET) =   525.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.79
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.28
  HALFSTREET FLOOD WIDTH(FEET) =    7.44
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.82
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
STREET FLOW TRAVEL TIME(MIN.) =   3.11   Tc(MIN.) =    8.22
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.693
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .5400
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.542
SUBAREA AREA(ACRES) =    1.78      SUBAREA RUNOFF(CFS) =    6.43
TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       6.82

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.70
FLOW VELOCITY(FEET/SEC.) =  3.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.03
LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2240.00 =     615.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2240.00 TO NODE   2236.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1278.00  DOWNSTREAM(FEET) =  1277.00
  FLOW LENGTH(FEET) =   690.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.91
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.82
  PIPE TRAVEL TIME(MIN.) =   3.95    Tc(MIN.) =   12.17
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2236.00 =    1305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2236.00 TO NODE   2236.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.17
  RAINFALL INTENSITY(INCH/HR) =   5.20
  TOTAL STREAM AREA(ACRES) =     1.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.82

****************************************************************************
  FLOW PROCESS FROM NODE   2238.00 TO NODE   2237.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1295.00
  DOWNSTREAM ELEVATION(FEET) =   1292.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.056
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.385
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE   2237.00 TO NODE   2236.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1292.00  DOWNSTREAM ELEVATION(FEET) = 1283.00
  STREET LENGTH(FEET) =   295.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.25
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
  STREET FLOW TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =    8.70
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.453
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.09      SUBAREA RUNOFF(CFS) =    3.59
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       4.08

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.04
  FLOW VELOCITY(FEET/SEC.) =  3.32   DEPTH*VELOCITY(FT*FT/SEC.) =   0.89
  LONGEST FLOWPATH FROM NODE   2238.00 TO NODE   2236.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2236.00 TO NODE   2236.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.70
  RAINFALL INTENSITY(INCH/HR) =   6.45
  TOTAL STREAM AREA(ACRES) =     1.24
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.08

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.82    12.17        5.196          1.88
      2        4.08     8.70        6.453          1.24
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.95     8.70       6.453
      2       10.10    12.17       5.196

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.10   Tc(MIN.) =   12.17
  TOTAL AREA(ACRES) =        3.1
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2236.00 =    1305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2236.00 TO NODE   2235.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1277.00  DOWNSTREAM(FEET) =  1276.00
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.81
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.10
  PIPE TRAVEL TIME(MIN.) =   0.83    Tc(MIN.) =   13.00
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2235.00 =    1545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2235.00 TO NODE   2235.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.00
  RAINFALL INTENSITY(INCH/HR) =   4.98
  TOTAL STREAM AREA(ACRES) =     3.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.10

****************************************************************************
  FLOW PROCESS FROM NODE   2234.00 TO NODE   2233.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1284.00
  DOWNSTREAM ELEVATION(FEET) =   1283.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE   2233.00 TO NODE   2235.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1283.00  DOWNSTREAM ELEVATION(FEET) = 1282.00
  STREET LENGTH(FEET) =    95.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.75
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.40
  STREET FLOW TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =    8.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.640
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.55      SUBAREA RUNOFF(CFS) =    1.86
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.85
  FLOW VELOCITY(FEET/SEC.) =  1.90   DEPTH*VELOCITY(FT*FT/SEC.) =   0.50
```

```
 LONGEST FLOWPATH FROM NODE   2234.00 TO NODE   2235.00 =     160.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2235.00 TO NODE   2235.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.32
 RAINFALL INTENSITY(INCH/HR) =   6.64
 TOTAL STREAM AREA(ACRES) =     0.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.23

 ** CONFLUENCE DATA **
 STREAM     RUNOFF        Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       10.10    13.00        4.979          3.12
     2        2.23     8.32        6.640          0.66

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        9.81     8.32       6.640
     2       11.78    13.00       4.979

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.78   Tc(MIN.) =   13.00
 TOTAL AREA(ACRES) =        3.8
 LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2235.00 =    1545.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2235.00 TO NODE   2232.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1276.00  DOWNSTREAM(FEET) =  1274.00
 FLOW LENGTH(FEET) =    55.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.33
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.78
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   13.08
```

```
 LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2232.00 =    1600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2232.00 TO NODE   2232.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.08
 RAINFALL INTENSITY(INCH/HR) =   4.96
 TOTAL STREAM AREA(ACRES) =     3.78
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.78

****************************************************************************
 FLOW PROCESS FROM NODE   2227.00 TO NODE   2226.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
 UPSTREAM ELEVATION(FEET) =   1296.00
 DOWNSTREAM ELEVATION(FEET) =   1295.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.663
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.663
 SUBAREA RUNOFF(CFS) =      0.48
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
 FLOW PROCESS FROM NODE   2226.00 TO NODE   2232.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1295.00  DOWNSTREAM ELEVATION(FEET) = 1274.00
 STREET LENGTH(FEET) =   495.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
```

```
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.58
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.56
  STREET FLOW TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =    8.42
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.589
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    2.70      SUBAREA RUNOFF(CFS) =   10.14
  TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =      10.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.47
  FLOW VELOCITY(FEET/SEC.) =  5.46   DEPTH*VELOCITY(FT*FT/SEC.) =   2.16
  LONGEST FLOWPATH FROM NODE   2227.00 TO NODE   2232.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2232.00 TO NODE   2232.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.42
  RAINFALL INTENSITY(INCH/HR) =   6.59
  TOTAL STREAM AREA(ACRES) =     2.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.55

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.78    13.08        4.959          3.78
      2       10.55     8.42        6.589          2.81

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.42     8.42       6.589
```

```
     2       19.72    13.08       4.959

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.72   Tc(MIN.) =   13.08
  TOTAL AREA(ACRES) =        6.6
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2232.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2232.00 TO NODE   2268.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1274.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.67
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.72
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   13.43
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2268.80 =    1845.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2268.80 TO NODE   2268.80 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.43
  RAINFALL INTENSITY(INCH/HR) =   4.88
  TOTAL STREAM AREA(ACRES) =     6.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.72

****************************************************************************
  FLOW PROCESS FROM NODE   2270.00 TO NODE   2269.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.33
  UPSTREAM ELEVATION(FEET) =   1278.00
  DOWNSTREAM ELEVATION(FEET) =   1276.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.241
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.262
```

```
  SUBAREA RUNOFF(CFS) =      0.37
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
  FLOW PROCESS FROM NODE   2269.00 TO NODE   2268.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1276.00  DOWNSTREAM ELEVATION(FEET) = 1275.00
  STREET LENGTH(FEET) =   110.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.42
  STREET FLOW TRAVEL TIME(MIN.) =   1.08   Tc(MIN.) =    8.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.641
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.77      SUBAREA RUNOFF(CFS) =    2.61
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       2.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.04
  FLOW VELOCITY(FEET/SEC.) =  1.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.55
  LONGEST FLOWPATH FROM NODE   2270.00 TO NODE   2268.00 =     193.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2268.00 TO NODE   2268.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =  1269.00  DOWNSTREAM(FEET) =  1267.00
 FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.19
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.95
 PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    8.60
 LONGEST FLOWPATH FROM NODE   2270.00 TO NODE   2268.80 =     298.33 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2268.80 TO NODE   2268.80 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.60
 RAINFALL INTENSITY(INCH/HR) =   6.50
 TOTAL STREAM AREA(ACRES) =     0.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.95

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       19.72    13.43        4.875          6.59
     2        2.95     8.60        6.500          0.87

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       17.74     8.60       6.500
     2       21.93    13.43       4.875

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      21.93   Tc(MIN.) =   13.43
 TOTAL AREA(ACRES) =        7.5
 LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2268.80 =    1845.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2268.80 TO NODE   2267.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1267.00  DOWNSTREAM(FEET) =  1262.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.18
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.93
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   13.66
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2267.00 =    2010.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2267.00 TO NODE   2267.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.66
  RAINFALL INTENSITY(INCH/HR) =   4.82
  TOTAL STREAM AREA(ACRES) =     7.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.93

****************************************************************************
  FLOW PROCESS FROM NODE   1280.00 TO NODE   1275.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1280.00
  DOWNSTREAM ELEVATION(FEET) =   1275.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.424
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.750
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   2265.00 TO NODE   2267.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1275.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
  STREET LENGTH(FEET) =   350.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.85
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   2.19   Tc(MIN.) =    7.62
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.030
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.26      SUBAREA RUNOFF(CFS) =    4.52
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       4.98

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.34
  FLOW VELOCITY(FEET/SEC.) =  3.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  LONGEST FLOWPATH FROM NODE   1280.00 TO NODE   2267.00 =     435.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2267.00 TO NODE   2267.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.62
  RAINFALL INTENSITY(INCH/HR) =   7.03
  TOTAL STREAM AREA(ACRES) =     1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.98

****************************************************************************
  FLOW PROCESS FROM NODE   2264.00 TO NODE   2263.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.58
  UPSTREAM ELEVATION(FEET) =   1274.00
  DOWNSTREAM ELEVATION(FEET) =   1272.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.114
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.346
  SUBAREA RUNOFF(CFS) =      0.37
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
  FLOW PROCESS FROM NODE   2263.00 TO NODE   2262.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1272.00  DOWNSTREAM ELEVATION(FEET) = 1271.00
  STREET LENGTH(FEET) =   125.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.44
  STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =    8.36
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.620
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.35      SUBAREA RUNOFF(CFS) =    1.18
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       1.52

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.44
  FLOW VELOCITY(FEET/SEC.) =  1.83   DEPTH*VELOCITY(FT*FT/SEC.) =   0.54
```

```
 LONGEST FLOWPATH FROM NODE   2264.00 TO NODE   2262.00 =     206.58 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2262.00 TO NODE   2267.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1265.00  DOWNSTREAM(FEET) =  1264.00
 FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.74
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.52
 PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    8.59
 LONGEST FLOWPATH FROM NODE   2264.00 TO NODE   2267.00 =     271.58 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2267.00 TO NODE   2267.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.59
 RAINFALL INTENSITY(INCH/HR) =   6.51
 TOTAL STREAM AREA(ACRES) =     0.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.52

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       21.93    13.66        4.823          7.46
     2        4.98     7.62        7.030          1.39
     3        1.52     8.59        6.505          0.45

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       21.38     7.62       7.030
     2       22.39     8.59       6.505
     3       26.48    13.66       4.823
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.48   Tc(MIN.) =   13.66
  TOTAL AREA(ACRES) =        9.3
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2267.00 =    2010.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2267.00 TO NODE   2271.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1258.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.21
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.48
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   14.07
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2271.00 =    2290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2271.00 TO NODE   2271.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       26.48    14.07       4.731        9.30
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2271.00 =    2290.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       16.15     8.82       6.395        4.82
  LONGEST FLOWPATH FROM NODE   2494.00 TO NODE   2271.00 =    1045.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      32.75       8.82        6.395
      2      38.43      14.07        4.731

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      38.43   Tc(MIN.) =   14.07
  TOTAL AREA(ACRES) =       14.1
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2271.00 TO NODE   2271.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2271.00 TO NODE   2261.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1258.00  DOWNSTREAM(FEET) =  1257.50
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.97
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.43
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   14.08
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2261.00 =    2300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2261.00 TO NODE   2261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.08
  RAINFALL INTENSITY(INCH/HR) =   4.73
  TOTAL STREAM AREA(ACRES) =    14.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.43

****************************************************************************
  FLOW PROCESS FROM NODE   2260.00 TO NODE   2259.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1278.00
  DOWNSTREAM ELEVATION(FEET) =   1276.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.49
```

```
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE   2259.00 TO NODE   2261.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1276.00  DOWNSTREAM ELEVATION(FEET) = 1263.50
  STREET LENGTH(FEET) =   370.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.26
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
  STREET FLOW TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =    8.61
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.495
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.67      SUBAREA RUNOFF(CFS) =    5.53
  TOTAL AREA(ACRES) =        1.8        PEAK FLOW RATE(CFS) =       5.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.16
  FLOW VELOCITY(FEET/SEC.) =  4.38   DEPTH*VELOCITY(FT*FT/SEC.) =   1.53
  LONGEST FLOWPATH FROM NODE   2260.00 TO NODE   2261.00 =     450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2261.00 TO NODE   2261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.61
  RAINFALL INTENSITY(INCH/HR) =   6.49
  TOTAL STREAM AREA(ACRES) =     1.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.96

****************************************************************************
  FLOW PROCESS FROM NODE   2258.00 TO NODE   2257.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1271.00
  DOWNSTREAM ELEVATION(FEET) =   1269.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   2257.00 TO NODE   2261.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1269.00  DOWNSTREAM ELEVATION(FEET) = 1263.50
  STREET LENGTH(FEET) =   250.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.03
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
  STREET FLOW TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =    8.44
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.578
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
 SUBAREA AREA(ACRES) =    0.89      SUBAREA RUNOFF(CFS) =    2.99
 TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.46

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.70
 FLOW VELOCITY(FEET/SEC.) =  3.26   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
 LONGEST FLOWPATH FROM NODE   2258.00 TO NODE   2261.00 =     330.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2261.00 TO NODE   2261.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.44
 RAINFALL INTENSITY(INCH/HR) =   6.58
 TOTAL STREAM AREA(ACRES) =     1.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.46

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       38.43    14.08        4.729         14.12
     2        5.96     8.61        6.495          1.80
     3        3.46     8.44        6.578          1.03

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       32.34     8.44       6.578
     2       32.87     8.61       6.495
     3       45.25    14.08       4.729

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      45.25   Tc(MIN.) =   14.08
 TOTAL AREA(ACRES) =       17.0
 LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2261.00 =    2300.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2261.00 TO NODE   2256.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1257.50  DOWNSTREAM(FEET) =  1244.00
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.12
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      45.25
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   14.22
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2256.00 =    2470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2256.00 TO NODE   2256.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.22
  RAINFALL INTENSITY(INCH/HR) =   4.70
  TOTAL STREAM AREA(ACRES) =    16.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.25

****************************************************************************
  FLOW PROCESS FROM NODE   2255.00 TO NODE   2254.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1275.00
  DOWNSTREAM ELEVATION(FEET) =   1274.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.73
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
  FLOW PROCESS FROM NODE   2254.00 TO NODE   2253.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1274.00  DOWNSTREAM ELEVATION(FEET) = 1267.00
  STREET LENGTH(FEET) =   295.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.74
  STREET FLOW TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =    9.15
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.246
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.54      SUBAREA RUNOFF(CFS) =    1.72
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.36

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.04
  FLOW VELOCITY(FEET/SEC.) =  3.08   DEPTH*VELOCITY(FT*FT/SEC.) =   0.88
  LONGEST FLOWPATH FROM NODE   2255.00 TO NODE   2253.00 =     360.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2253.00 TO NODE   2256.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1261.00  DOWNSTREAM(FEET) =  1244.00
  FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.20
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.36
```

```
  PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =    9.84
  LONGEST FLOWPATH FROM NODE   2255.00 TO NODE   2256.00 =     700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2256.00 TO NODE   2256.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.84
  RAINFALL INTENSITY(INCH/HR) =   5.96
  TOTAL STREAM AREA(ACRES) =     0.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.36

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       45.25    14.22        4.700         16.95
      2        2.36     9.84        5.960          0.74

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       38.04     9.84       5.960
      2       47.11    14.22       4.700

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.11   Tc(MIN.) =   14.22
  TOTAL AREA(ACRES) =       17.7
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2256.00 =    2470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2256.00 TO NODE   2252.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1244.00  DOWNSTREAM(FEET) =  1243.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.96
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      47.11
```

```
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   14.45
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2252.00 =    2595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2252.00 TO NODE   2252.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.45
  RAINFALL INTENSITY(INCH/HR) =   4.65
  TOTAL STREAM AREA(ACRES) =    17.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     47.11

****************************************************************************
  FLOW PROCESS FROM NODE   2251.00 TO NODE   2250.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1266.00
  DOWNSTREAM ELEVATION(FEET) =   1261.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.951
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.242
  SUBAREA RUNOFF(CFS) =      0.76
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.76

****************************************************************************
  FLOW PROCESS FROM NODE   2250.00 TO NODE   2252.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1261.00  DOWNSTREAM ELEVATION(FEET) = 1249.00
  STREET LENGTH(FEET) =   350.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```

```
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
  STREET FLOW TRAVEL TIME(MIN.) =   1.67   Tc(MIN.) =    7.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.024
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    2.51
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       3.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.44
  FLOW VELOCITY(FEET/SEC.) =  3.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.12
  LONGEST FLOWPATH FROM NODE   2251.00 TO NODE   2252.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2252.00 TO NODE   2252.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.63
  RAINFALL INTENSITY(INCH/HR) =   7.02
  TOTAL STREAM AREA(ACRES) =     0.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.15

****************************************************************************
  FLOW PROCESS FROM NODE   2250.20 TO NODE   2250.40 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1265.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.390
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      1.00
TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
FLOW PROCESS FROM NODE   2250.40 TO NODE   2252.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1265.00  DOWNSTREAM ELEVATION(FEET) = 1249.00
STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.28
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.30
  HALFSTREET FLOOD WIDTH(FEET) =    8.51
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.90
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
STREET FLOW TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =    6.33
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.917
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .5700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
SUBAREA AREA(ACRES) =    1.01      SUBAREA RUNOFF(CFS) =    4.56
TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       5.42

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.59
FLOW VELOCITY(FEET/SEC.) =  4.37   DEPTH*VELOCITY(FT*FT/SEC.) =   1.48
LONGEST FLOWPATH FROM NODE   2250.20 TO NODE   2252.00 =     530.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2252.00 TO NODE   2252.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.33
  RAINFALL INTENSITY(INCH/HR) =   7.92
  TOTAL STREAM AREA(ACRES) =     1.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       47.11    14.45        4.651         17.69
      2        3.15     7.63        7.024          0.88
      3        5.42     6.33        7.917          1.20

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       35.71     6.33       7.917
      2       39.15     7.63       7.024
      3       52.38    14.45       4.651

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      52.38   Tc(MIN.) =   14.45
  TOTAL AREA(ACRES) =       19.8
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2252.00 =    2595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2252.00 TO NODE   2252.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2249.00 TO NODE   2248.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1320.00
  DOWNSTREAM ELEVATION(FEET) =   1314.00
```

```
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.250
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.935
  SUBAREA RUNOFF(CFS) =      1.12
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.12

****************************************************************************
  FLOW PROCESS FROM NODE   2248.00 TO NODE   2247.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1314.00  DOWNSTREAM ELEVATION(FEET) = 1306.00
  STREET LENGTH(FEET) =   100.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.61
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    4.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   0.35   Tc(MIN.) =    5.60
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.568
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.98
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       2.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.52
  FLOW VELOCITY(FEET/SEC.) =  4.85   DEPTH*VELOCITY(FT*FT/SEC.) =   1.15
  LONGEST FLOWPATH FROM NODE   2249.00 TO NODE   2247.00 =     200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2247.00 TO NODE   2246.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1300.00  DOWNSTREAM(FEET) =  1264.00
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.05
  PIPE TRAVEL TIME(MIN.) =   0.78    Tc(MIN.) =    6.39
  LONGEST FLOWPATH FROM NODE   2249.00 TO NODE   2246.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2246.00 TO NODE   2246.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.39
  RAINFALL INTENSITY(INCH/HR) =   7.88
  TOTAL STREAM AREA(ACRES) =     0.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.05

****************************************************************************
  FLOW PROCESS FROM NODE   2245.00 TO NODE   2244.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1294.00
  DOWNSTREAM ELEVATION(FEET) =    128.00
  ELEVATION DIFFERENCE(FEET) =   1166.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.428
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.00
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE   2244.00 TO NODE   2246.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1289.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
  STREET LENGTH(FEET) =   330.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.38
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.13
  STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =    5.68
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.492
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.57      SUBAREA RUNOFF(CFS) =    2.76
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       3.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.04
  FLOW VELOCITY(FEET/SEC.) =  4.81   DEPTH*VELOCITY(FT*FT/SEC.) =   1.38
  LONGEST FLOWPATH FROM NODE   2245.00 TO NODE   2246.00 =     430.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2246.00 TO NODE   2246.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.68
  RAINFALL INTENSITY(INCH/HR) =   8.49
  TOTAL STREAM AREA(ACRES) =     0.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.68
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.05     6.39        7.875          0.42
      2        3.68     5.68        8.492          0.76

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        5.50     5.68       8.492
      2        5.46     6.39       7.875

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.50   Tc(MIN.) =    5.68
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE   2249.00 TO NODE   2246.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2246.00 TO NODE   2252.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1243.00
  FLOW LENGTH(FEET) =   525.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.64
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.50
  PIPE TRAVEL TIME(MIN.) =   0.91    Tc(MIN.) =    6.59
  LONGEST FLOWPATH FROM NODE   2249.00 TO NODE   2252.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2252.00 TO NODE   2252.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.50     6.59       7.718        1.18
  LONGEST FLOWPATH FROM NODE   2249.00 TO NODE   2252.00 =    1165.00 FEET.
```

```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       52.38    14.45        4.651       19.77
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2252.00 =    2595.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      29.39       6.59        7.718
      2      55.70      14.45        4.651

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      55.70   Tc(MIN.) =   14.45
  TOTAL AREA(ACRES) =       21.0

****************************************************************************
  FLOW PROCESS FROM NODE   2252.00 TO NODE   2252.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2252.00 TO NODE   2223.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1243.00  DOWNSTREAM(FEET) =  1242.00
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.03
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      55.70
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   14.49
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2223.00 =    2630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2223.00 TO NODE   2281.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1242.00  DOWNSTREAM(FEET) =   1240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   205.00   CHANNEL SLOPE =  0.0098
  CHANNEL FLOW THRU SUBAREA(CFS) =      55.70
  FLOW VELOCITY(FEET/SEC) =   3.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   15.35
```

```
  LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2281.00 =    2835.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       21.0  TC(MIN.) =     15.35
  PEAK FLOW RATE(CFS)   =      55.70
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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*AREA ALREADY ACCOUNTED FOR

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2599	2598	2	1290	1288	80	0.51	0.17				
2598	2597	6	1288	1280	800	0.51	3.15	1 SIDE			
2597	2593	3	1274	1267	195						
2593	2593	1						1 OF 2			
2596	2595	2	1290	1288	83.33	0.51	0.09				
2595	2594	6	1288	1274	435	0.51	1.93	2 SIDES			
2594	2593	3	1268	1267.8	30						
2593	2593	1						2 OF 2			
2593	2589	3	1267.8	1267	175						
2589	2589	1						1 OF 2			
2592	2591	2	1288	1286	83.33	0.51	0.08				
2591	2590	6	1286	1274	440	0.51	0.93	2 SIDES			
2590	2589	3	1268	1267.6	40						
2589	2589	1						2 OF 2			
2589	2584	3	1267.6	1259	385						
2584	2584	1						1 OF 2			
2588	2587	2	1282	1281	67.65	0.51	0.10				
2587	2584	6	1281	1265	745	0.51	3.35	2 SIDES			
2584	2584	1						2 OF 2			
2584	2568	3	1259	1257	65						
2568	2568	10						SAVE TO BANK 1			
2580	2579	2	1291.5	1289	87.50	0.57	0.23				
2579	2578	6	1289	1282	785	0.51	2.78	1 SIDE			
2578	2575	3	1276	1267	320						
2575	2575	1						1 OF 2			
2583	2582	2	1286	1285	70	0.51	0.05				
2582	2581	6	1285	1274	315	0.51	1.06	2 SIDES			
2581	2575	3	1268	1267	60						
2575	2575	1						2 OF 2			
2575	2573	3	1267	1263.8	105						
2573	2573	1						1 OF 2			
2577	2576	2	1286	1284	80	0.51	0.08				
2576	2574	6	1284	1270	455	0.51	2.24	1 SIDE			
2574	2573	3	1264	1263.8	10						

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2573	2573	1						2 OF 2			
2573	2569	3	1263.8	1263.3	65						
2569	2569	1						1 OF 2			
2572	2571	2	1284	1283	70	0.51	0.04				
2571	2570	6	1283	1270	365	0.51	1.22	2 SIDES			
2570	2569	3	1264	1263	60						
2569	2569	1						2 OF 2			
2569	2568	3	1263	1257	230						
2568	2568	11						ADD BANK 1			
2568	2568	12						CLEAR BANK 1			
2568	2565	3	1257	1251	205						
2565	2565	1						1 OF 2			
2568.2	2567	2	1271	1269	81.58	0.51	0.07				
2567	2566	6	1269	1257	460	0.51	2.15	1 SIDE			
2566	2565	3	1257	1256.8	10						
2565	2565	1						2 OF 2			
2565	2544	3	1256.8	1256	45						
2544	2544	10						SAVE TO BANK 1			
2553	2553.2	2	1265	1263	80	0.51	0.11				
2553.2	2551.2	6	1263	1261	170	0.51	0.58	1 SIDE			
2551.2	2552	3	1255	1254	30						
2552	2552	1						2 OF 2			
2552	2545	3	1254	1250	325						
2545	2545	1						1 OF 3			
2551	2550	2	1262	1261	65	0.51	0.13				
2550	2549	6	1261	1257	330	0.51	1.84	1 SIDE			
2549	2545	3	1251	1250	10						
2545	2545	1						2 OF 3			
2548	2547	2	1265	1264	68.75	0.51	0.19				
2547	2546	5	1264	1258	410	0.51	3.15				
2546	2545	3	1252	1250	45						
2545	2545	1						3 OF 3			
2545	2544	3	1250	1249	60						

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									1	2	3
2544	2544	11						ADD BANK 1			
2544	2544	12						CLEAR BANK 1			
2544	2542	3	1249	1248	125						
2542	2542	1						1 OF 2			
2543	2542	2	1255	1254	65	0.51	0.39	2 SIDES			
2542	2542	1						2 OF 2			
2542	2515	3	1254	1246.7	60						
2515	2515	10						SAVE TO BANK 1			
2541	2540	2	1315	1310	100	0.9	0.20				
2540	2539	6	1310	1285	335	0.9	0.50	1 SIDE			
2539	2538	3	1279	1270	310						
2538	2538	1						1 OF 2			
2537	2536	2	1285	1282	95	0.9	0.15				
2536	2538	6	1282	1270	210	0.89	0.32	1 SIDE			
2538	2538	1						2 OF 2			
2538	2534	3	1264	1250	480						
2534	2534	1						1 OF 2			
2533	2532	2	1270	1265	70	0.88	0.37				
2532	2534	6	1265	1256	375	0.88	1.06	1 SIDE			
2534	2534	1						2 OF 2			
2534	2527	3	1250	1247.2	460						
2527	2527	1						1 OF 2			
2526	2525	2	1256	1255	65	0.51	0.29				
2525	2527	6	1255	1253.2	355	0.51	0.79	2 SIDES			
2527	2527	1						2 OF 2			
2527	2515	3	1247.2	1246.7	45						
2515	2515	10						SAVE TO BANK 2			
2523	2522	2	1275	1274	65	0.88	0.19				
2522	2520	6	1274	1260	820	0.88	1.30	2 SIDES			
2520	2519	3	1248	1247.2	515						
2519	2519	1						1 OF 2			
2518	2517	2	1260	1259	66.67	0.88	0.13				

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2517	2519	6	1259	1253.2	510	0.88	1.01	2 SIDES			
2519	2519	1						2 OF 2			
2519	2515	3	1247.2	1246.7	60						
2515	2515	11						ADD BANK 2			
2515	2515	12						CLEAR BANK 2			
2515	2515	11						ADD BANK 1			
2515	2515	12						CLEAR BANK 1			
2515	2514	3	1247	1139	1060						
2514	2514	1						1 of 2			
2513	2512	2	1253	1250	95	0.88	0.16				
2512	2514	6	1250	1145	945	0.88	1.43	2 SIDES			
2514	2514	1						2 OF 2			
2514	2510	3	1139	1104	290						
2510	2510	1						1 OF 2			
2509	2508	2	1142	1133	95	0.88	0.13				
2508	2510	6	1133	1110	185	0.88	0.29	2 SIDES			
2510	2510	1						2 OF 2			
2510	2506	3	1104	1075	300						
2506	2506	1						1 OF 2			
2505	2504	2	1110	1095	100	0.88	0.16				
2504	2506	6	1095	1075	160	0.88	0.24	2 SIDES			
2506	2506	1						2 OF 2			
2506	2502	3	1069	1034	190						
2502	2502	1						1 OF 2			
2501	2500	2	1075	1062	80	0.88	0.13				
2500	2502	6	1062	1040	190	0.89	0.29	2 SIDES			
2502	2502	1						2 OF 2			
2502	2499.2	3	1034	994	305						
2499.2	2499.2	1						1 OF 2			
2499.6	2499.8	2	1040	1022	100	0.89	0.20				
2499.8	2499.2	6	1022	1000	185	0.89	0.27	2 SIDES			
2499.2	2499.2	1						2 OF 2			

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2499.2	2472	3	994	970	350						
2472	2472	10						SAVE TO BANK 1			
2487	2486	2	1405	1375	100	0.25	0.27				
2486	2485	5	1375	1294	400	0.25	3.38				
2485	2485	1						1 OF 2			
2484	2483	2	1325	1320	95	0.25	0.25				
2483	2485	5	1320	1294	205	0.25	*				
2485	2485	1						2 OF 2			
2485	2482	3	1288	1251	95						
2482	2482	1						1 OF 2			
2481	2480	2	1270	1268	80	0.25	0.12				
2480	2482	5	1268	1257	425	0.25	1.46				
2482	2482	1						2 OF 2			
2482	2478	3	1251	1247	430						
2478	2478	1						1 OF 2			
2477	2476	2	1300	1298	80	0.25	0.10				
2476	2475	5	1298	1268	410	0.25	0.48				
2475	2478	3	1262	1247	995						
2478	2478	1						2 OF 2			
2478	2515.6	3	1247	1246	130						
2515.6	2515.6	1						1 of 2			
2515.8	2515.7	2	1254	1253	65	0.25	0.24				
2515.7	2515.6	5	1253	1252	510	0.25	3.25				
2515.6	2515.6	1						2 of 2			
2515.6	2474	3	1246	1244	50						
2474	2473.5	5	1244	978.5	955	0.25	10.53				
2473.5	2473.5	1						1 of 2			
2488	2473	2	1250	1200	100	0.25	0.50				
2473	2473.5	5	1200	978.5	930	0.27	12.02				
2473.5	2473.5	1						2 of 2			
2473.5	2472	5	978.5	976	410	0.29	13.37				
2472	2472	11						ADD BANK 1			

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2472	2472	12						CLEAR BANK 1			
2472	2472	7	Q=20.1 cfs	Tc = 15.71 min		A = 81.7 ac		CANYON DET.			
2472	2471	3	970	920	385						
2471	2471	1						1 OF 2			
2470	2469	2	1030	1024	100	0.25	0.59				
2469	2471	5	1024	934	925	0.25	1.30				
2471	2471	1						2 OF 2			
2471	2459	3	928	914	200						
2459	2459	10						SAVE TO BANK 1			
2468	2467	2	1255	1197	100	0.25	0.36				
2467	2460	5	1197	923	1265	0.25	5.11				
2460	2460	10						SAVE TO BANK 2			
2465	2464	2	1225	1215	100	0.25	0.45				
2464	2463	5	1215	912	2135	0.25	7.44				
2463	2463	1						1 OF 2			
2462	2461	2	925	923	80	0.57	0.11				
2461	2463	6	923	916	590	0.57	3.38	2 SIDES			
2463	2463	1						2 OF 2			
2463	2460	3	913	912	225						
2460	2460	11						ADD BANK 2			
2460	2460	12						CLEAR BANK 2			
2460	2459	3	912	911	145						
2459	2459	11						ADD BANK 1			
2459	2459	12						CLEAR BANK 1			
2459	2458	3	911	905	635						
2458	2458	10						SAVE TO BANK 1			
2457	2456	2	920	917	95	0.57	0.19				
2456	2456.1	6	917	910	355	0.57	2.02	1 SIDE			
2456.1	2455	3	904	897	300						
2455	2455	1						1 OF 2			
2456.2	2456.3	2	912	909	90	0.57	0.09				
2456.3	2455	6	909	903	245	0.57	4.61	2 SIDES			
2455	2455	1						2 OF 2			

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2455	2454	3	897	896	160						
2454	2453	5	902	901	35						
2453	2458	3	901	900	515						
2458	2458	11						ADD BANK 1			
2458	2458	12						CLEAR BANK 1			
2458	2452	3	902	896	315						
2452	2452	1						1 OF 2			
2451	2450	2	1185	1150	100	0.25	0.27				
2450	2449	5	1150	960	615	0.25	10.64				
2449	2452	3	954	896	820						
2452	2452	1						2 OF 2			
2452	2448	3	896	889	210						
2448	2448	10						SAVE BANK 1			
2447	2446	2	912	911	67.65	0.57	0.09				
2446	2445	5	911	900	620	0.57	2.40				
2445	2445	1						1 OF 2			
2444	2443	2	912	910	83.33	0.57	0.06				
2443	2445	6	910	900	700	0.57	1.04	1 SIDE			
2445	2445	1						2 OF 2			
2445	2448	3	894	889	75						
2448	2448	11						ADD BANK 1			
2448	2448	12						CLEAR BANK 1			
2448	2442	3	889	888	50						
2442	2442	1						1 OF 2			
2441	2440	2	908	905	95	0.57	0.11				
2440	2439	5	905	895	315	0.57	1.57				
2439	2442	3	889	888	120						
2442	2442	1						2 OF 2			
2442	2438	3	888	887	50						
2438	3438	1						1 OF 2			

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2437	2436	2	897	895	80	0.57	0.13				
2436	2435	6	895	894	300	0.57	0.86	2 SIDES			
2435	2438	3	888	887	110						
2438	2438	1						2 OF 2			
2438	2434	3	889	887	355						
2434	2434	1						1 OF 2			
2433	2432	2	903	899	95	0.57	0.15				
2432	2431	5	899	896	510	0.57	2.93				
2431	2434	3	890	889	65						
2434	2434	1						2 OF 2			
2434	2430	3	889	888	45						
2430	2430	1						1 OF 2			
2429	2428	2	1290	1235	100	0.25	0.29				
2428	2427	5	1235	910	710	0.26	23.50				
2427	2430	3	904	888	395						
2430	2430	1						2 OF 2			
2430	2391	3	888	877	400						
2391	2391	10						SAVE BANK 1			
2417	2416	2	906	905	65	0.57	0.06				
2416	2415	6	905	895	325	0.57	1.88				
2415	2414	3	889	888	160						
2414	2414	10						SAVE BANK 2			
2400	2399	2	1000	987	100	0.89	0.15				
2399	2398	6	987	940	445	0.89	0.68	2 SIDES			
2398	2397	3	934	908	400						
2397	2397	1						1 OF 2			
2396	2395	2	940	930	100	0.57	0.18				
2395	2397	6	930	916	285	0.57	0.42	2 SIDES			
2397	2397	1						2 OF 2			
2397	2394	3	910	894	455						
2394	2394	1						1 OF 2			
2393	2392	2	916	912	97.50	0.57	0.19				
2392	2394	6	912	900	365	0.57	0.56	2 SIDES			

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Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2394	2394	1						2 OF 2			
2394	2414	3	894	888	105						
2414	2414	11						ADD BANK 2			
2414	2414	12						CLEAR BANK 2			
2414	2391	5	894	883	320		*				
2391	2391	11						ADD BANK 1			
2391	2391	12						CLEAR BANK 1			
2391	2418	3	877	869	267						
2418	2418	10						SAVE BANK 1			
2425	2424	2	1198	1135	100	0.25	0.52				
2424	2423	5	1135	926	715	0.25	6.25				
2423	2422.5	3	920	891	75						
2422.5	2422.5	1						1 OF 2			
2422.7	2422.6	2	914	912	80	0.25	0.11				
2422.6	2422.5	5	912	897	550	0.3	0.53				
2422.5	2422.5	1						2 OF 2			
2422.5	2422	3	891	881	350						
2422	2422	10						SAVE TO BANK 2			
2421	2420	2	1185	1143	100	0.25	0.56				
2420	2419	5	1143	918	765	0.25	4.46				
2419	2422.2	3	912	885	80						
2422.2	2422.2	1						1 of 2			
2422.6	2422.4	2	897	895	80	0.3	0.14				
2422.4	2422.2	5	895	891	145	0.3	0.31				
2422.2	2422.2	1						2 of 2			
2422.2	2422	3	885	881	400						
2422	2422	11						Add bank 2			
2422	2422	12						Clear bank 2			
2422	2418	3	881	869	690						
2418	2418	11						ADD BANK 1			
2418	2418	12						CLEAR BANK 1			
2418	2418	10						SAVE TO BANK 1			
2418.9	2418.8	2	922	920	80	0.51	0.24				

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2418.8	2418.2	6	920	907	660	0.51	2.71	2 sides			
2418.2	2418.2	1						1 of 2			
2417.84	2417.85	2	919	918	70	0.57	0.08				
2417.85	2418.2	6	918	907	1005	0.57	3.99	2 sides			
2418.2	2418.2	1						2 of 2			
2418.2	2418.7	5	907	902	425	0.57	0.69				
2418.7	2418.6	3	896	890	145						
2418.6	2418.6	10						save to Bank 2			
2418.5	2418.4	2	1105	1055	100	0.25	0.25				
2418.4	2418.3	5	1055	909	410	0.25	4.91				
2418.3	2418.32	3	903	900	340						
2418.32	2418.32	1						1 of 2			
2418.1	2417.9	2	925	918	75	0.55	0.08				
2417.9	2417.91	6	918	912	115	0.57	0.51	2 sides			
2417.91	2417.8	5	912	908	530	0.57	2.18				
2417.8	2417.32	3	902	900	50						
2417.32	2417.32	1						2 of 2			
2418.32	2417.7	3	900	899	115						
2417.7	2417.7	10						save to bank 3			
2417.6	2417.5	2	1185	1145	100	0.3	0.34				
2417.5	2417.4	5	1145	908	580	0.3	3.81				
2417.4	2417.3	3	902	899	110						
2417.3	2417.3	1						1 of 2			
2417.2	2417.1	2	1190	1136	100	0.3	0.21				
2417.1	2417.3	5	1136	910	1085	0.3	6.18				
2417.3	2417.3	1						2 of 2			
2417.3	2417.7	3	904	899	85						
2417.7	2417.7	1						1 OF 2			
2417.7	2417.7	7	Q=308.19		A=192.1	T_c=17.37		ADD RUN 25.1			
2417.7	2417.7	1						2 OF 2			
2417.7	2417.7	11						ADD BANK 3			
2417.7	2417.7	12						CLEAR BANK 3			
2417.7	2418.6	3	899	891	515						
2418.6	2418.6	11						ADD BANK 2			

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2418.6	2418.6	12						CLEAR BANK 2			
2418.6	2418	3	891	869	745						
2418	2418	11						ADD BANK 1			
2418	2418	12						CLEAR BANK 1			
2418	2380.2	3	869	858	325						
2380.2	2380.2	10						SAVE TO BANK 1			
2415.9	2415.8	2	915	907	85	0.57	0.10				
2415.8	2415.7	6	907	902	395	0.57	2.43	2 SIDES			
2415.7	2415.6	3	896	895	245						
2415.6	2415.6	1						1 OF 2			
2415.5	2415.4	2	905	904	68.75	0.57	0.07				
2415.4	2415.3	6	904	898	420	0.57	1.93	2 SIDES			
2415.3	2415.6	3	892	891	40						
2415.6	2415.6	1						2 OF 2			
2415.6	2415.2	3	891	874	600						
2415.2	2415.2	1						1 OF 2			
2415.1	2414.9	2	902	900	81.58	0.57	0.12				
2414.9	2415.2	6	900	880	725	0.57	3.27	2 SIDES			
2415.2	2415.2	1						2 OF 2			
2415.2	2414.8	3	874	849	55						
2414.8	2414.7	5	855	854	135	0.57	8.65				
2414.7	2414.7	7	Q = 3.7 cfs	Tc = 10.44 mins		A=16.6 ac		EAST VALLEY DET.			
2414.7	2380.2	3	848	847	105						
2380.2	2380.2	11						ADD BANK 1			
2380.2	2380.2	12						CLEAR BANK 1			
2380.2	2380	3	847	831	65						
2380	2380	10						SAVE TO BANK 1			
2413	2412	2	891	888	95	0.57	0.10				
2412	2412.5	6	888	882	358	0.57	1.84	1 SIDE			
2412.5	2412.5	1						2 OF 2			
2412.5	2411	3	876	874	360						
2411	2411	1						1 OF 2			
2410	2409	2	895	894	68.75	0.57	0.07				
2409	2411	6	894	880	495	0.57	3.81	2 SIDES			
2411	2411	1						2 OF 2			

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Newland Sierra

Job #: 2660-02

Date: 2/16/2017

Run Name: P-25d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2411	2408	3	874	873	65						
2408	2408	1						1 OF 2			
2407	2406	2	885	883	85	0.57	0.10				
2406	2405	6	883	880	285	0.57	1.61	2 SIDES			
2405	2408	3	874	873	330						
2408	2408	1						2 OF 2			
2408	2404	3	873	867	395						
2404	2404	1						1 OF 2			
2403	2402	2	885	884	66.67	0.57	0.13				
2402	2404	6	884	873	425	0.57	1.93	2 SIDES			
2404	2404	1						2 OF 2			
2404	2401	3	867	830	160						
2401	2380	5	830	829	95	0.57	1.66				
2380	2380	10						SAVE TO BANK 2			
2390	2389	2	900	895	100	0.57	0.20				
2389	2389.5	6	895	876	565	0.57	0.91	2 SIDES			
2389.5	2388	3	870	867	75						
2388	2388	1						1 OF 2			
2387	2386	2	881	878	95	0.57	0.11				
2386	2385	6	878	874	170	0.57	0.95	2 SIDES		#	
2385	2388	3	868	867	35						
2388	2388	1						2 OF 2			
2388	2384	3	867	859	200						
2384	2384	1						1 OF 2			
2383	2382	2	876	872	97.50	0.57	0.20				
2382	2384	6	872	865	150	0.57	0.20	2 SIDES			
2384	2384	1						2 OF 2			
2384	2381	3	859	832	90						
2381	2380	5	832	830	80						
2380	2380	11						ADD BANK 2			
2380	2380	12						CLEAR BANK 2			
2380	2380	7	Q =7.4 cf Tc = 10.46 min A =13.8 ac					WEST VALLEY DET.			
2380	2380	11						ADD BANK 1			
2380	2380	12						CLEAR BANK 1			

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Run Name: P-25d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2380	2379	5	837	825	170						
2379	2379	10						SAVE TO BANK 1			
2378	2377	2	1175	1155	85	0.25	0.10				
2377	2376	5	1155	1070	300	0.25	1.84				
2376	2375	5	1070	955	605	0.25	10.41				
2375	2374	5	955	885	455	0.26	16.11				
2374	2379.2	5	885	855	420	0.3	4.23				
2379.2	2379.2	10						SAVE TO BANK 2			
2373	2372	2	925	924	65	0.57	0.09				
2372	2371	6	924	914	290	0.57	1.30	2 SIDES			
2371	2370	3	908	906	310						
2370	2370	1						1 OF 2			
2369	2368	2	920	917	95	0.57	0.11				
2368	2370	6	917	912	360	0.57	2.01	2 SIDES			
2370	2370	1						2 OF 2			
2370	2367	3	906	894	300						
2367	2367	1						1 OF 2			
2366	2365	2	911	909	81.58	0.57	0.06				
2365	2367	6	909	900	405	0.57	1.80	1 SIDE			
2367	2367	1						2 OF 2			
2367	2364	3	894	887	205						
2364	2364	1						1 OF 2			
2363	2362	2	905	903	83.33	0.57	0.10				
2362	2364	6	903	894	230	0.57	1.02	1 SIDE			
2364	2364	1						2 OF 2			
2364	2361	3	888	884	100						
2361	2361	1						1 OF 2			
2360	2359	2	898	895	95	0.57	0.14				
2359	2361	6	895	890	195	0.57	0.88	1SIDE			
2361	2361	1						2 OF 2			
2361	2358	3	884	879	145						
2358	2358	1						1 OF 2			
2357	2356	2	895	892.4	85	0.57	0.10				
2356	2358	6	892.4	885	370	0.57	1.77	2 SIDES			

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Date: 2/16/2017

Run Name: P-25d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2358	2358	1						2 OF 2			
2358	2555	3	879	865	205						
2555	2554.8	5	865	864	50	0.3	0.78				
2554.8	2379.2	5	864	855	300	0.28	4.94				
2379.2	2379.2	11						ADD BANK 2			
2379.2	2379.2	12						CLEAR BANK 2			
2379.2	2379	5	855	825	610	0.3	5.40				
2379	2379	11						ADD BANK 1			
2379	2379	12						CLEAR BANK 1			
2379	2379	1						1 OF 2			
2370	2369	2	1065	1020	95	0.42	0.11				
2369	2368	5	1020	860	360						
2369	2368	8				0.42	0.93				
2368	2367	3	865	830	115						
2367	2379	5	830	825	110						
2379	2379	1						2 OF 2			
2379	2378	5	825	815	655						
2379	2378	8				0.42	13.91				
2378	2378	1						1 OF 3			
2366	2365	2	1180	1175	80.00	0.42	0.13				
2365	2364	5	1175	860	665						
2365	2364	8				0.42	3.34				
2364	2363	3	860	842	100						
2363	2378	5	842	815	450						
2378	2378	1						2 OF 3			
2362	2361	2	1175	1165	80	0.42	0.10				
2361	2360	5	1165	865	580.00						
2361	2360	8				0.42	2.99				
2360	2359	3	865	839	100						
2359	2378	5	839	815	310						
2378	2378	1						3 OF 3			
2378	25	5	815	795	935						
2378	25	8				0.42	4.80				
25	25	1						1 OF 2			
25.3	25.2	2	1175	1150	90	0.38	0.29				

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Date: 2/16/2017

Run Name: P-25d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
25.2	25.1	5	1150	935	590						
25.2	25.1	8				0.38	9.55				
25.1	25	5	935	795	2310						
25.1	25	8				0.36	30.51				
25	25	1						2 OF 2			
25	24.9	5	795	763	1270			VALLEY			
25	24.9	8				0.41	15.21				
							360.01				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                    *
* SUB BASIN 25 - POST DETENTION                                         *
* JANUARY 2017                                                          *
 ************************************************************************

  FILE NAME: P-25D.DAT
  TIME/DATE OF STUDY: 11:20 02/16/2017
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2599.00 TO NODE   2598.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1290.00
  DOWNSTREAM ELEVATION(FEET) =   1288.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.64

****************************************************************************
  FLOW PROCESS FROM NODE   2598.00 TO NODE   2597.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1288.00  DOWNSTREAM ELEVATION(FEET) = 1280.00
  STREET LENGTH(FEET) =   800.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.92
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =   5.06   Tc(MIN.) =   12.06
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.227
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    3.15      SUBAREA RUNOFF(CFS) =    8.40
  TOTAL AREA(ACRES) =        3.3        PEAK FLOW RATE(CFS) =       8.85

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.72
  FLOW VELOCITY(FEET/SEC.) =  3.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.40
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2597.00 =     880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2597.00 TO NODE   2593.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1274.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   195.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.52
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.85
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   12.36
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2593.00 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2593.00 TO NODE   2593.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.36
  RAINFALL INTENSITY(INCH/HR) =   5.14
  TOTAL STREAM AREA(ACRES) =     3.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.85

****************************************************************************
  FLOW PROCESS FROM NODE   2596.00 TO NODE   2595.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.33
  UPSTREAM ELEVATION(FEET) =   1290.00
  DOWNSTREAM ELEVATION(FEET) =   1288.00
```

```
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.241
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.262
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE   2595.00 TO NODE   2594.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1288.00  DOWNSTREAM ELEVATION(FEET) = 1274.00
  STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.35
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.24
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.82
  STREET FLOW TRAVEL TIME(MIN.) =   2.24   Tc(MIN.) =    9.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.105
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.93      SUBAREA RUNOFF(CFS) =    6.01
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       6.29

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.51
  FLOW VELOCITY(FEET/SEC.) =  3.74   DEPTH*VELOCITY(FT*FT/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE   2596.00 TO NODE   2594.00 =     518.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2594.00 TO NODE   2593.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1268.00  DOWNSTREAM(FEET) =  1267.80
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.29
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.58
  LONGEST FLOWPATH FROM NODE   2596.00 TO NODE   2593.00 =     548.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2593.00 TO NODE   2593.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.58
  RAINFALL INTENSITY(INCH/HR) =   6.06
  TOTAL STREAM AREA(ACRES) =     2.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.29

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.85    12.36        5.143          3.32
      2        6.29     9.58        6.064          2.02

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       13.14     9.58       6.064
      2       14.18    12.36       5.143

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      14.18   Tc(MIN.) =   12.36
  TOTAL AREA(ACRES) =        5.3
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2593.00 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2593.00 TO NODE   2589.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1267.80  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.26
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.18
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   12.92
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2589.00 =    1250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2589.00 TO NODE   2589.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.92
  RAINFALL INTENSITY(INCH/HR) =   5.00
  TOTAL STREAM AREA(ACRES) =     5.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.18

****************************************************************************
  FLOW PROCESS FROM NODE   2592.00 TO NODE   2591.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.33
  UPSTREAM ELEVATION(FEET) =   1288.00
  DOWNSTREAM ELEVATION(FEET) =   1286.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.241
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.262
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE   2591.00 TO NODE   2590.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1286.00  DOWNSTREAM ELEVATION(FEET) = 1274.00
```

```
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.70
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    4.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.58
  STREET FLOW TRAVEL TIME(MIN.) =   2.73   Tc(MIN.) =    9.97
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.910
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.93      SUBAREA RUNOFF(CFS) =    2.80
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.04

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.25
  FLOW VELOCITY(FEET/SEC.) =  2.99   DEPTH*VELOCITY(FT*FT/SEC.) =   0.75
  LONGEST FLOWPATH FROM NODE   2592.00 TO NODE   2590.00 =     523.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2590.00 TO NODE   2589.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1268.00  DOWNSTREAM(FEET) =  1267.60
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.95
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.04
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   10.10
  LONGEST FLOWPATH FROM NODE   2592.00 TO NODE   2589.00 =     563.33 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2589.00 TO NODE   2589.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.10
  RAINFALL INTENSITY(INCH/HR) =   5.86
  TOTAL STREAM AREA(ACRES) =     1.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.04

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.18    12.92        4.999          5.34
      2        3.04    10.10        5.859          1.01

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.15    10.10       5.859
      2       16.78    12.92       4.999

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.78   Tc(MIN.) =   12.92
  TOTAL AREA(ACRES) =        6.4
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2589.00 =    1250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2589.00 TO NODE   2584.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1267.60  DOWNSTREAM(FEET) =  1259.00
  FLOW LENGTH(FEET) =   385.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.24
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.78
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   13.55
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2584.00 =    1635.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2584.00 TO NODE   2584.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.55
  RAINFALL INTENSITY(INCH/HR) =   4.85
  TOTAL STREAM AREA(ACRES) =     6.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.78

****************************************************************************
  FLOW PROCESS FROM NODE   2588.00 TO NODE   2587.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    67.65
  UPSTREAM ELEVATION(FEET) =   1282.00
  DOWNSTREAM ELEVATION(FEET) =   1281.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.668
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.999
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2587.00 TO NODE   2584.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1281.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   745.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.94
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.29
  HALFSTREET FLOOD WIDTH(FEET) =    8.37
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.02
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.89
 STREET FLOW TRAVEL TIME(MIN.) =   4.12   Tc(MIN.) =   11.78
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.304
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
 SUBAREA AREA(ACRES) =    3.35      SUBAREA RUNOFF(CFS) =    9.06
 TOTAL AREA(ACRES) =        3.4        PEAK FLOW RATE(CFS) =       9.33

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.09
 FLOW VELOCITY(FEET/SEC.) =  3.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
 LONGEST FLOWPATH FROM NODE   2588.00 TO NODE   2584.00 =     812.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2584.00 TO NODE   2584.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.78
 RAINFALL INTENSITY(INCH/HR) =   5.30
 TOTAL STREAM AREA(ACRES) =     3.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.33

 ** CONFLUENCE DATA **
 STREAM     RUNOFF        Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       16.78    13.55        4.849          6.35
     2        9.33    11.78        5.304          3.45

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       24.67    11.78       5.304
     2       25.31    13.55       4.849
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      25.31   Tc(MIN.) =   13.55
  TOTAL AREA(ACRES) =        9.8
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2584.00 =    1635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2584.00 TO NODE   2568.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1259.00  DOWNSTREAM(FEET) =  1257.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.48
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.31
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   13.63
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2568.00 =    1700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2568.00 TO NODE   2568.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2580.00 TO NODE   2579.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.50
  UPSTREAM ELEVATION(FEET) =   1291.50
  DOWNSTREAM ELEVATION(FEET) =   1289.00
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.289
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.953
  SUBAREA RUNOFF(CFS) =      1.04
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      1.04

****************************************************************************
  FLOW PROCESS FROM NODE   2579.00 TO NODE   2578.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
```

```
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1289.00  DOWNSTREAM ELEVATION(FEET) = 1282.00
  STREET LENGTH(FEET) =   785.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   13.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
  STREET FLOW TRAVEL TIME(MIN.) =   5.17   Tc(MIN.) =   11.46
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.400
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.515
  SUBAREA AREA(ACRES) =    2.78      SUBAREA RUNOFF(CFS) =    7.66
  TOTAL AREA(ACRES) =        3.0        PEAK FLOW RATE(CFS) =       8.36

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.72
  FLOW VELOCITY(FEET/SEC.) =  2.87   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2578.00 =     872.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2578.00 TO NODE   2575.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1276.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.46
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.36
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   12.03
```

```
 LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2575.00 =    1192.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2575.00 TO NODE   2575.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.03
 RAINFALL INTENSITY(INCH/HR) =   5.24
 TOTAL STREAM AREA(ACRES) =     3.01
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.36

****************************************************************************
 FLOW PROCESS FROM NODE   2583.00 TO NODE   2582.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =   1286.00
 DOWNSTREAM ELEVATION(FEET) =   1285.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.889
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.871
 SUBAREA RUNOFF(CFS) =      0.18
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
 FLOW PROCESS FROM NODE   2582.00 TO NODE   2581.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1285.00  DOWNSTREAM ELEVATION(FEET) = 1274.00
 STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
```

```
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.81
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.64
  STREET FLOW TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =    9.62
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.045
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.06      SUBAREA RUNOFF(CFS) =    3.27
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       3.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.25
  FLOW VELOCITY(FEET/SEC.) =  3.36   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE   2583.00 TO NODE   2581.00 =     385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2581.00 TO NODE   2575.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1268.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.16
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.42
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    9.78
  LONGEST FLOWPATH FROM NODE   2583.00 TO NODE   2575.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2575.00 TO NODE   2575.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.78
  RAINFALL INTENSITY(INCH/HR) =   5.98
```

```
  TOTAL STREAM AREA(ACRES) =     1.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.36    12.03        5.236          3.01
      2        3.42     9.78        5.981          1.11

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.23     9.78       5.981
      2       11.36    12.03       5.236

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.36   Tc(MIN.) =   12.03
  TOTAL AREA(ACRES) =        4.1
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2575.00 =    1192.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2575.00 TO NODE   2573.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1267.00  DOWNSTREAM(FEET) =  1263.80
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.49
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.36
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   12.19
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2573.00 =    1297.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2573.00 TO NODE   2573.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.19
  RAINFALL INTENSITY(INCH/HR) =   5.19
  TOTAL STREAM AREA(ACRES) =     4.12
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.36

****************************************************************************
  FLOW PROCESS FROM NODE   2577.00 TO NODE   2576.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1286.00
  DOWNSTREAM ELEVATION(FEET) =   1284.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE   2576.00 TO NODE   2574.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1284.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
  STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.22
  STREET FLOW TRAVEL TIME(MIN.) =   1.97   Tc(MIN.) =    8.97
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.326
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    2.24      SUBAREA RUNOFF(CFS) =    7.23
  TOTAL AREA(ACRES) =        2.3        PEAK FLOW RATE(CFS) =       7.48

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.47
  FLOW VELOCITY(FEET/SEC.) =  4.47   DEPTH*VELOCITY(FT*FT/SEC.) =   1.68
  LONGEST FLOWPATH FROM NODE   2577.00 TO NODE   2574.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2574.00 TO NODE   2573.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1263.80
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.09
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.48
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    8.99
  LONGEST FLOWPATH FROM NODE   2577.00 TO NODE   2573.00 =     545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2573.00 TO NODE   2573.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.99
  RAINFALL INTENSITY(INCH/HR) =   6.32
  TOTAL STREAM AREA(ACRES) =     2.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.48

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.36    12.19        5.189          4.12
      2        7.48     8.99        6.316          2.32

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.82     8.99       6.316
      2       17.51    12.19       5.189

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.51   Tc(MIN.) =   12.19
  TOTAL AREA(ACRES) =        6.4
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2573.00 =    1297.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2573.00 TO NODE   2569.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.80  DOWNSTREAM(FEET) =  1263.30
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.81
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.51
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   12.35
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2569.00 =    1362.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2569.00 TO NODE   2569.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.35
  RAINFALL INTENSITY(INCH/HR) =   5.15
  TOTAL STREAM AREA(ACRES) =     6.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.51

****************************************************************************
  FLOW PROCESS FROM NODE   2572.00 TO NODE   2571.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1284.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1283.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.889
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.871
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.14

****************************************************************************
  FLOW PROCESS FROM NODE   2571.00 TO NODE   2570.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1283.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
  STREET LENGTH(FEET) =   365.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.00
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    4.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.67
  STREET FLOW TRAVEL TIME(MIN.) =   1.97   Tc(MIN.) =    9.85
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.953
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.22      SUBAREA RUNOFF(CFS) =    3.70
  TOTAL AREA(ACRES) =        1.3        PEAK FLOW RATE(CFS) =       3.83

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.58
  FLOW VELOCITY(FEET/SEC.) =  3.47   DEPTH*VELOCITY(FT*FT/SEC.) =   0.89
  LONGEST FLOWPATH FROM NODE   2572.00 TO NODE   2570.00 =     435.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2570.00 TO NODE   2569.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1263.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.35
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.83
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   10.01
  LONGEST FLOWPATH FROM NODE   2572.00 TO NODE   2569.00 =     495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2569.00 TO NODE   2569.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.01
  RAINFALL INTENSITY(INCH/HR) =   5.89
  TOTAL STREAM AREA(ACRES) =     1.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       17.51    12.35        5.146          6.44
      2        3.83    10.01        5.893          1.26

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.12    10.01       5.893
      2       20.85    12.35       5.146

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.85   Tc(MIN.) =   12.35
  TOTAL AREA(ACRES) =        7.7
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2569.00 =    1362.50 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2569.00 TO NODE   2568.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1263.00  DOWNSTREAM(FEET) =  1257.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.35
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.85
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   12.69
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2568.00 =    1592.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2568.00 TO NODE   2568.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       20.85    12.69       5.057        7.70
  LONGEST FLOWPATH FROM NODE   2580.00 TO NODE   2568.00 =    1592.50 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       25.31    13.63       4.829        9.80
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2568.00 =    1700.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      44.41      12.69        5.057
      2      45.22      13.63        4.829

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      45.22   Tc(MIN.) =   13.63
  TOTAL AREA(ACRES) =       17.5

****************************************************************************
  FLOW PROCESS FROM NODE   2568.00 TO NODE   2568.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2568.00 TO NODE   2565.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1257.00  DOWNSTREAM(FEET) =  1251.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.31
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      45.22
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   13.87
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2565.00 =    1905.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2565.00 TO NODE   2565.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.87
  RAINFALL INTENSITY(INCH/HR) =   4.78
  TOTAL STREAM AREA(ACRES) =    17.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.22

****************************************************************************
  FLOW PROCESS FROM NODE   2568.20 TO NODE   2567.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.58
  UPSTREAM ELEVATION(FEET) =   1271.00
  DOWNSTREAM ELEVATION(FEET) =   1269.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.114
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.346
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE   2567.00 TO NODE   2566.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1269.00  DOWNSTREAM ELEVATION(FEET) = 1257.00
  STREET LENGTH(FEET) =   460.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.56
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.13
  STREET FLOW TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =    9.27
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.193
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    2.15      SUBAREA RUNOFF(CFS) =    6.79
  TOTAL AREA(ACRES) =        2.2        PEAK FLOW RATE(CFS) =       7.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.59
  FLOW VELOCITY(FEET/SEC.) =  4.11   DEPTH*VELOCITY(FT*FT/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE   2568.20 TO NODE   2566.00 =     541.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2566.00 TO NODE   2565.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1257.00  DOWNSTREAM(FEET) =  1256.80
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.97
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.01
```

```
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    9.29
  LONGEST FLOWPATH FROM NODE   2568.20 TO NODE   2565.00 =     551.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2565.00 TO NODE   2565.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.29
  RAINFALL INTENSITY(INCH/HR) =   6.18
  TOTAL STREAM AREA(ACRES) =     2.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       45.22    13.87        4.775         17.50
      2        7.01     9.29        6.184          2.22

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       37.30     9.29       6.184
      2       50.64    13.87       4.775

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      50.64   Tc(MIN.) =   13.87
  TOTAL AREA(ACRES) =       19.7
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2565.00 =    1905.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2565.00 TO NODE   2544.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1256.80  DOWNSTREAM(FEET) =  1256.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.05
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.64
```

```
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   13.93
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2544.00 =    1950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2544.00 TO NODE   2544.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2553.00 TO NODE   2553.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1265.00
  DOWNSTREAM ELEVATION(FEET) =   1263.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE   2553.20 TO NODE   2551.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1263.00  DOWNSTREAM ELEVATION(FEET) = 1261.00
  STREET LENGTH(FEET) =   170.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
```

```
    HALFSTREET FLOOD WIDTH(FEET) =    7.38
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.58
  STREET FLOW TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =    8.34
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.629
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    1.96
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.37
  FLOW VELOCITY(FEET/SEC.) =  2.34   DEPTH*VELOCITY(FT*FT/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE   2553.00 TO NODE   2551.20 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2551.20 TO NODE   2552.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1255.00  DOWNSTREAM(FEET) =  1254.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.33
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.41
  LONGEST FLOWPATH FROM NODE   2553.00 TO NODE   2552.00 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2552.00 TO NODE   2545.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1254.00  DOWNSTREAM(FEET) =  1250.00
  FLOW LENGTH(FEET) =   325.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.96
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.33
  PIPE TRAVEL TIME(MIN.) =   1.09    Tc(MIN.) =    9.51
  LONGEST FLOWPATH FROM NODE   2553.00 TO NODE   2545.00 =     605.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2545.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.51
  RAINFALL INTENSITY(INCH/HR) =   6.09
  TOTAL STREAM AREA(ACRES) =     0.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.33

****************************************************************************
  FLOW PROCESS FROM NODE   2551.00 TO NODE   2550.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1262.00
  DOWNSTREAM ELEVATION(FEET) =   1261.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE   2550.00 TO NODE   2549.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1261.00  DOWNSTREAM ELEVATION(FEET) = 1257.00
  STREET LENGTH(FEET) =   330.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.89
  STREET FLOW TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =    9.55
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.075
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =    5.70
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       6.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.91
  FLOW VELOCITY(FEET/SEC.) =  2.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE   2551.00 TO NODE   2549.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2549.00 TO NODE   2545.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1251.00  DOWNSTREAM(FEET) =  1250.00
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.80
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.10
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    9.56
  LONGEST FLOWPATH FROM NODE   2551.00 TO NODE   2545.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2545.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.56
  RAINFALL INTENSITY(INCH/HR) =   6.07
  TOTAL STREAM AREA(ACRES) =     1.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.10
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2548.00 TO NODE   2547.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.75
  UPSTREAM ELEVATION(FEET) =   1265.00
  DOWNSTREAM ELEVATION(FEET) =   1264.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.772
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.938
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
  FLOW PROCESS FROM NODE   2547.00 TO NODE   2546.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1264.00  DOWNSTREAM(FEET) =   1258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.0146
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.879
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.00
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   10.05
  SUBAREA AREA(ACRES) =     3.15       SUBAREA RUNOFF(CFS) =    9.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  TOTAL AREA(ACRES) =        3.3         PEAK FLOW RATE(CFS) =      10.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.63
  LONGEST FLOWPATH FROM NODE   2548.00 TO NODE   2546.00 =     478.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2546.00 TO NODE   2545.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1252.00  DOWNSTREAM(FEET) =  1250.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.74
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.01
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.11
  LONGEST FLOWPATH FROM NODE   2548.00 TO NODE   2545.00 =     523.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2545.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.11
  RAINFALL INTENSITY(INCH/HR) =   5.86
  TOTAL STREAM AREA(ACRES) =     3.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.33     9.51        6.093          0.69
      2        6.10     9.56        6.071          1.97
      3       10.01    10.11        5.855          3.34

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       17.82     9.51       6.093
      2       17.90     9.56       6.071
      3       18.14    10.11       5.855

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.14   Tc(MIN.) =   10.11
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE   2553.00 TO NODE   2545.00 =     605.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2544.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1250.00  DOWNSTREAM(FEET) =  1249.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.17
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.14
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   10.22
  LONGEST FLOWPATH FROM NODE   2553.00 TO NODE   2544.00 =     665.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2544.00 TO NODE   2544.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       18.14    10.22       5.815        6.00
  LONGEST FLOWPATH FROM NODE   2553.00 TO NODE   2544.00 =     665.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       50.64    13.93       4.761       19.72
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2544.00 =    1950.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      55.29      10.22        5.815
      2      65.49      13.93        4.761

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      65.49   Tc(MIN.) =   13.93
  TOTAL AREA(ACRES) =       25.7

****************************************************************************
  FLOW PROCESS FROM NODE   2544.00 TO NODE   2544.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2544.00 TO NODE   2542.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1249.00  DOWNSTREAM(FEET) =  1248.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.60
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      65.49
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   14.15
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2542.00 =    2075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2542.00 TO NODE   2542.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.15
  RAINFALL INTENSITY(INCH/HR) =   4.71
  TOTAL STREAM AREA(ACRES) =    25.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     65.49

****************************************************************************
  FLOW PROCESS FROM NODE   2543.00 TO NODE   2542.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1255.00
  DOWNSTREAM ELEVATION(FEET) =   1254.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      1.42
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      1.42

****************************************************************************
  FLOW PROCESS FROM NODE   2542.00 TO NODE   2542.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.42
  RAINFALL INTENSITY(INCH/HR) =   7.15
  TOTAL STREAM AREA(ACRES) =     0.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       65.49    14.15        4.714         25.72
      2        1.42     7.42        7.151          0.39

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       35.75     7.42       7.151
      2       66.43    14.15       4.714

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      66.43   Tc(MIN.) =   14.15
  TOTAL AREA(ACRES) =       26.1
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2542.00 =    2075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2542.00 TO NODE   2515.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1254.00  DOWNSTREAM(FEET) =  1246.70
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.92
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.43
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   14.19
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2515.00 =    2135.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2515.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```

```
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE   2541.00 TO NODE   2540.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1315.00
  DOWNSTREAM ELEVATION(FEET) =   1310.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.105
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.66
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      1.66

**************************************************************************
  FLOW PROCESS FROM NODE   2540.00 TO NODE   2539.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) = 1310.00  DOWNSTREAM ELEVATION(FEET) = 1285.00
  STREET LENGTH(FEET) =   335.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.73
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.32
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.48
  STREET FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    3.16
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    4.15
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       5.81

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.30
  FLOW VELOCITY(FEET/SEC.) =  5.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.84
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2539.00 =     435.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2539.00 TO NODE   2538.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1279.00  DOWNSTREAM(FEET) =  1270.00
  FLOW LENGTH(FEET) =   310.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.70
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.81
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    3.75
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2538.00 =     745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2538.00 TO NODE   2538.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.75
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.81

****************************************************************************
  FLOW PROCESS FROM NODE   2537.00 TO NODE   2536.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1285.00
  DOWNSTREAM ELEVATION(FEET) =   1282.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.392
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.24
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      1.24

****************************************************************************
  FLOW PROCESS FROM NODE   2536.00 TO NODE   2538.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1282.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.56
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  STREET FLOW TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =    3.18
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.893
  SUBAREA AREA(ACRES) =    0.32      SUBAREA RUNOFF(CFS) =    2.63
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       3.87

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.24
  FLOW VELOCITY(FEET/SEC.) =  4.86   DEPTH*VELOCITY(FT*FT/SEC.) =   1.41
```

```
  LONGEST FLOWPATH FROM NODE   2537.00 TO NODE   2538.00 =     305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2538.00 TO NODE   2538.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.18
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.87

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.81     3.75        9.222          0.70
      2        3.87     3.18        9.222          0.47

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.80     3.18       9.222
      2        9.68     3.75       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.68   Tc(MIN.) =    3.75
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2538.00 =     745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2538.00 TO NODE   2534.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1264.00  DOWNSTREAM(FEET) =  1250.00
  FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.94
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.68
```

```
  PIPE TRAVEL TIME(MIN.) =   0.80    Tc(MIN.) =    4.55
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2534.00 =    1225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2534.00 TO NODE   2534.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.55
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.68

****************************************************************************
  FLOW PROCESS FROM NODE   2533.00 TO NODE   2532.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1265.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.720
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      3.00
  TOTAL AREA(ACRES) =      0.37   TOTAL RUNOFF(CFS) =      3.00

****************************************************************************
  FLOW PROCESS FROM NODE   2532.00 TO NODE   2534.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1265.00  DOWNSTREAM ELEVATION(FEET) = 1256.00
  STREET LENGTH(FEET) =   375.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
```

```
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.03
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.56
  STREET FLOW TRAVEL TIME(MIN.) =   1.55   Tc(MIN.) =    3.27
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    1.06      SUBAREA RUNOFF(CFS) =    8.60
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =      11.60

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.66
  FLOW VELOCITY(FEET/SEC.) =  4.52   DEPTH*VELOCITY(FT*FT/SEC.) =   1.98
  LONGEST FLOWPATH FROM NODE   2533.00 TO NODE   2534.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2534.00 TO NODE   2534.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.27
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.68     4.55        9.222          1.17
      2       11.60     3.27        9.222          1.43

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       21.29     3.27       9.222
      2       21.29     4.55       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.29   Tc(MIN.) =    4.55
  TOTAL AREA(ACRES) =        2.6
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2534.00 =    1225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2534.00 TO NODE   2527.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1250.00  DOWNSTREAM(FEET) =  1247.20
  FLOW LENGTH(FEET) =   460.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.55
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.29
  PIPE TRAVEL TIME(MIN.) =   1.17    Tc(MIN.) =    5.72
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2527.00 =    1685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2527.00 TO NODE   2527.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.72
  RAINFALL INTENSITY(INCH/HR) =   8.45
  TOTAL STREAM AREA(ACRES) =     2.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.29

****************************************************************************
  FLOW PROCESS FROM NODE   2526.00 TO NODE   2525.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1256.00
  DOWNSTREAM ELEVATION(FEET) =   1255.00
```

```
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.417
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.151
  SUBAREA RUNOFF(CFS) =      1.06
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.06

****************************************************************************
  FLOW PROCESS FROM NODE   2525.00 TO NODE   2527.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1255.00  DOWNSTREAM ELEVATION(FEET) = 1253.20
  STREET LENGTH(FEET) =   355.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    7.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.41
  STREET FLOW TRAVEL TIME(MIN.) =   4.16   Tc(MIN.) =   11.58
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.366
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    2.16
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       2.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.24
  FLOW VELOCITY(FEET/SEC.) =  1.52   DEPTH*VELOCITY(FT*FT/SEC.) =   0.47
  LONGEST FLOWPATH FROM NODE   2526.00 TO NODE   2527.00 =     420.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2527.00 TO NODE   2527.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.58
  RAINFALL INTENSITY(INCH/HR) =   5.37
  TOTAL STREAM AREA(ACRES) =     1.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.96

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       21.29     5.72        8.451          2.60
      2        2.96    11.58        5.366          1.08

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       22.75     5.72       8.451
      2       16.47    11.58       5.366

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.75   Tc(MIN.) =    5.72
  TOTAL AREA(ACRES) =        3.7
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2527.00 =    1685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2527.00 TO NODE   2515.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1247.20  DOWNSTREAM(FEET) =  1246.70
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.51
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.75
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    5.81
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2515.00 =    1730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2515.00 IS CODE =  10
----------------------------------------------------------------------------
```

```
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   2523.00 TO NODE   2522.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1275.00
  DOWNSTREAM ELEVATION(FEET) =   1274.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.766
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.54
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.54

********************************************************************************
  FLOW PROCESS FROM NODE   2522.00 TO NODE   2520.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1274.00  DOWNSTREAM ELEVATION(FEET) = 1260.00
  STREET LENGTH(FEET) =   820.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.65
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.37
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.89
  STREET FLOW TRAVEL TIME(MIN.) =   4.82   Tc(MIN.) =    7.59
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.047
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    1.30      SUBAREA RUNOFF(CFS) =    8.06
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       9.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.53
  FLOW VELOCITY(FEET/SEC.) =  3.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.14
  LONGEST FLOWPATH FROM NODE   2523.00 TO NODE   2520.00 =     885.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2520.00 TO NODE   2519.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1248.00  DOWNSTREAM(FEET) =  1247.20
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.23
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.24
  PIPE TRAVEL TIME(MIN.) =   2.65    Tc(MIN.) =   10.24
  LONGEST FLOWPATH FROM NODE   2523.00 TO NODE   2519.00 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2519.00 TO NODE   2519.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.24
  RAINFALL INTENSITY(INCH/HR) =   5.81
  TOTAL STREAM AREA(ACRES) =     1.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.24

****************************************************************************
  FLOW PROCESS FROM NODE   2518.00 TO NODE   2517.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    66.67
```

```
  UPSTREAM ELEVATION(FEET) =   1260.00
  DOWNSTREAM ELEVATION(FEET) =   1259.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.825
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.05
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      1.05

****************************************************************************
  FLOW PROCESS FROM NODE   2517.00 TO NODE   2519.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1259.00  DOWNSTREAM ELEVATION(FEET) = 1253.20
  STREET LENGTH(FEET) =   510.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.55
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
  STREET FLOW TRAVEL TIME(MIN.) =   3.68   Tc(MIN.) =    6.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.785
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    1.01      SUBAREA RUNOFF(CFS) =    6.92
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       7.81

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.72
  FLOW VELOCITY(FEET/SEC.) =  2.62   DEPTH*VELOCITY(FT*FT/SEC.) =   0.94
  LONGEST FLOWPATH FROM NODE   2518.00 TO NODE   2519.00 =     576.67 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2519.00 TO NODE   2519.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.50
  RAINFALL INTENSITY(INCH/HR) =   7.79
  TOTAL STREAM AREA(ACRES) =     1.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.81

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.24    10.24        5.807          1.49
      2        7.81     6.50        7.785          1.14

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       13.68     6.50       7.785
      2       15.07    10.24       5.807

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.07   Tc(MIN.) =   10.24
  TOTAL AREA(ACRES) =        2.6
  LONGEST FLOWPATH FROM NODE   2523.00 TO NODE   2519.00 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2519.00 TO NODE   2515.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1247.20  DOWNSTREAM(FEET) =  1246.70
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.88
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.07
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   10.39
  LONGEST FLOWPATH FROM NODE   2523.00 TO NODE   2515.00 =    1460.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2515.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       15.07    10.39       5.755        2.63
  LONGEST FLOWPATH FROM NODE   2523.00 TO NODE   2515.00 =    1460.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       22.75     5.81       8.368        3.68
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2515.00 =    1730.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      31.18       5.81        8.368
      2      30.71      10.39        5.755

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.18   Tc(MIN.) =    5.81
  TOTAL AREA(ACRES) =        6.3

****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2515.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2515.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       31.18     5.81       8.368        6.31
  LONGEST FLOWPATH FROM NODE   2541.00 TO NODE   2515.00 =    1730.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       66.43    14.19       4.706       26.11
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2515.00 =    2135.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      58.40       5.81        8.368
      2      83.97      14.19        4.706

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      83.97   Tc(MIN.) =   14.19
  TOTAL AREA(ACRES) =       32.4

****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2515.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2515.00 TO NODE   2514.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1247.00  DOWNSTREAM(FEET) =  1139.00
  FLOW LENGTH(FEET) =  1060.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.67
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      83.97
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   14.85
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2514.00 =    3195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2514.00 TO NODE   2514.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.85
  RAINFALL INTENSITY(INCH/HR) =   4.57
  TOTAL STREAM AREA(ACRES) =    32.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     83.97

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2513.00 TO NODE   2512.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .8800
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =   1253.00
 DOWNSTREAM ELEVATION(FEET) =   1250.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.631
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.30
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      1.30

****************************************************************************
 FLOW PROCESS FROM NODE   2512.00 TO NODE   2514.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1250.00  DOWNSTREAM ELEVATION(FEET) = 1145.00
 STREET LENGTH(FEET) =   945.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.99
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.26
   HALFSTREET FLOOD WIDTH(FEET) =    6.71
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
 STREET FLOW TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =    5.19
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.997
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .8800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
```

```
  SUBAREA AREA(ACRES) =    1.43      SUBAREA RUNOFF(CFS) =   11.32
  TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =      12.59

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.84
  FLOW VELOCITY(FEET/SEC.) =  7.00   DEPTH*VELOCITY(FT*FT/SEC.) =   2.12
  LONGEST FLOWPATH FROM NODE   2513.00 TO NODE   2514.00 =    1040.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2514.00 TO NODE   2514.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.19
  RAINFALL INTENSITY(INCH/HR) =   9.00
  TOTAL STREAM AREA(ACRES) =     1.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       83.97    14.85        4.570         32.42
      2       12.59     5.19        8.997          1.59

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       41.96     5.19       8.997
      2       90.36    14.85       4.570

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      90.36   Tc(MIN.) =   14.85
  TOTAL AREA(ACRES) =       34.0
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2514.00 =    3195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2514.00 TO NODE   2510.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1139.00  DOWNSTREAM(FEET) =  1104.00
```

```
  FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.99
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      90.36
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   15.02
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2510.00 =    3485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2510.00 TO NODE   2510.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.02
  RAINFALL INTENSITY(INCH/HR) =   4.54
  TOTAL STREAM AREA(ACRES) =    34.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     90.36

****************************************************************************
  FLOW PROCESS FROM NODE   2509.00 TO NODE   2508.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1142.00
  DOWNSTREAM ELEVATION(FEET) =   1133.00
  ELEVATION DIFFERENCE(FEET) =      9.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.824
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.05
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      1.05

****************************************************************************
  FLOW PROCESS FROM NODE   2508.00 TO NODE   2510.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1133.00  DOWNSTREAM ELEVATION(FEET) = 1110.00
  STREET LENGTH(FEET) =   185.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.23
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.18
    HALFSTREET FLOOD WIDTH(FEET) =    2.79
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   0.54   Tc(MIN.) =    2.37
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    0.29      SUBAREA RUNOFF(CFS) =    2.35
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.26
  FLOW VELOCITY(FEET/SEC.) =  5.69   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE   2509.00 TO NODE   2510.00 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2510.00 TO NODE   2510.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.37
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       90.36    15.02        4.537         34.01
      2        3.41     2.37        9.222          0.42
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       47.86     2.37       9.222
      2       92.04    15.02       4.537

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      92.04   Tc(MIN.) =   15.02
  TOTAL AREA(ACRES) =       34.4
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2510.00 =    3485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2510.00 TO NODE   2506.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1104.00  DOWNSTREAM(FEET) =  1075.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.12
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      92.04
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   15.20
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2506.00 =    3785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2506.00 TO NODE   2506.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.20
  RAINFALL INTENSITY(INCH/HR) =   4.50
  TOTAL STREAM AREA(ACRES) =    34.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     92.04

****************************************************************************
  FLOW PROCESS FROM NODE   2505.00 TO NODE   2504.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1110.00
  DOWNSTREAM ELEVATION(FEET) =   1095.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.838
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.30
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      1.30

****************************************************************************
  FLOW PROCESS FROM NODE   2504.00 TO NODE   2506.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1095.00  DOWNSTREAM ELEVATION(FEET) = 1075.00
  STREET LENGTH(FEET) =   160.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.27
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.18
    HALFSTREET FLOOD WIDTH(FEET) =    2.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.68
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   0.47   Tc(MIN.) =    2.31
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    0.24      SUBAREA RUNOFF(CFS) =    1.95
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.25
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.06
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
  LONGEST FLOWPATH FROM NODE   2505.00 TO NODE   2506.00 =     260.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2506.00 TO NODE   2506.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.31
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.25

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       92.04    15.20        4.501         34.43
      2        3.25     2.31        9.222          0.40

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       48.17     2.31       9.222
      2       93.62    15.20       4.501

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      93.62   Tc(MIN.) =   15.20
  TOTAL AREA(ACRES) =       34.8
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2506.00 =    3785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2506.00 TO NODE   2502.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1069.00  DOWNSTREAM(FEET) =  1034.00
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.74
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      93.62
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   15.29
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2502.00 =    3975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.29
  RAINFALL INTENSITY(INCH/HR) =   4.48
  TOTAL STREAM AREA(ACRES) =    34.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     93.62

****************************************************************************
  FLOW PROCESS FROM NODE   2501.00 TO NODE   2500.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =   1062.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.644
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.05
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      1.05

****************************************************************************
  FLOW PROCESS FROM NODE   2500.00 TO NODE   2502.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1062.00  DOWNSTREAM ELEVATION(FEET) = 1040.00
  STREET LENGTH(FEET) =   190.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.19
    HALFSTREET FLOOD WIDTH(FEET) =    2.99
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
  STREET FLOW TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =    2.23
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.887
  SUBAREA AREA(ACRES) =    0.29      SUBAREA RUNOFF(CFS) =    2.38
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.39
  FLOW VELOCITY(FEET/SEC.) =  5.53   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
  LONGEST FLOWPATH FROM NODE   2501.00 TO NODE   2502.00 =     270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.23
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.44

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       93.62    15.29        4.484         34.83
      2        3.44     2.23        9.222          0.42

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       48.96     2.23       9.222
      2       95.29    15.29       4.484

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      95.29   Tc(MIN.) =   15.29
  TOTAL AREA(ACRES) =       35.2
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2502.00 =    3975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2499.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1034.00  DOWNSTREAM(FEET) =   994.00
  FLOW LENGTH(FEET) =   305.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.26
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      95.29
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   15.46
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2499.20 =    4280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2499.20 TO NODE   2499.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.46
  RAINFALL INTENSITY(INCH/HR) =   4.45
  TOTAL STREAM AREA(ACRES) =    35.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     95.29

****************************************************************************
  FLOW PROCESS FROM NODE   2499.60 TO NODE   2499.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1040.00
  DOWNSTREAM ELEVATION(FEET) =   1022.00
  ELEVATION DIFFERENCE(FEET) =     18.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.755
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.64
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      1.64

****************************************************************************
  FLOW PROCESS FROM NODE   2499.80 TO NODE   2499.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1022.00  DOWNSTREAM ELEVATION(FEET) = 1000.00
  STREET LENGTH(FEET) =   185.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.75
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    3.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
  STREET FLOW TRAVEL TIME(MIN.) =   0.57   Tc(MIN.) =    2.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.890
  SUBAREA AREA(ACRES) =    0.27      SUBAREA RUNOFF(CFS) =    2.22
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       3.86

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.22   HALFSTREET FLOOD WIDTH(FEET) =   4.65
```

```
 FLOW VELOCITY(FEET/SEC.) =  5.76   DEPTH*VELOCITY(FT*FT/SEC.) =   1.26
 LONGEST FLOWPATH FROM NODE   2499.60 TO NODE   2499.20 =     285.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2499.20 TO NODE   2499.20 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    2.32
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     0.47
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.86

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       95.29    15.46        4.453         35.25
     2        3.86     2.32        9.222          0.47

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       49.87     2.32       9.222
     2       97.15    15.46       4.453

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      97.15   Tc(MIN.) =   15.46
 TOTAL AREA(ACRES) =       35.7
 LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2499.20 =    4280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2499.20 TO NODE   2472.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   994.00  DOWNSTREAM(FEET) =   970.00
 FLOW LENGTH(FEET) =   350.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.63
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      97.15
```

```
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   15.71
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2472.00 =    4630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2472.00 TO NODE   2472.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2487.00 TO NODE   2486.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1405.00
  DOWNSTREAM ELEVATION(FEET) =   1375.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   2486.00 TO NODE   2485.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1375.00  DOWNSTREAM(FEET) =   1294.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.2025
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.710
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.15
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.08
  Tc(MIN.) =    8.19
  SUBAREA AREA(ACRES) =     3.38       SUBAREA RUNOFF(CFS) =    5.67
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       6.12
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   7.63
  LONGEST FLOWPATH FROM NODE   2487.00 TO NODE   2485.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2485.00 TO NODE   2485.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.19
  RAINFALL INTENSITY(INCH/HR) =   6.71
  TOTAL STREAM AREA(ACRES) =     3.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.12

****************************************************************************
  FLOW PROCESS FROM NODE   2484.00 TO NODE   2483.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1325.00
  DOWNSTREAM ELEVATION(FEET) =   1320.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.574
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.513
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE   2483.00 TO NODE   2485.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.00  DOWNSTREAM(FEET) =   1294.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   205.00   CHANNEL SLOPE =  0.1268
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.41
  FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =    9.29
  LONGEST FLOWPATH FROM NODE   2484.00 TO NODE   2485.00 =     300.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2485.00 TO NODE   2485.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.29
  RAINFALL INTENSITY(INCH/HR) =   6.18
  TOTAL STREAM AREA(ACRES) =     0.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.12     8.19        6.710          3.65
      2        0.41     9.29        6.182          0.25

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.48     8.19       6.710
      2        6.05     9.29       6.182

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.48   Tc(MIN.) =    8.19
  TOTAL AREA(ACRES) =        3.9
  LONGEST FLOWPATH FROM NODE   2487.00 TO NODE   2485.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2485.00 TO NODE   2482.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1288.00  DOWNSTREAM(FEET) =  1251.00
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.48
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.26
```

```
  LONGEST FLOWPATH FROM NODE   2487.00 TO NODE   2482.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2482.00 TO NODE   2482.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.26
  RAINFALL INTENSITY(INCH/HR) =   6.67
  TOTAL STREAM AREA(ACRES) =     3.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.48

****************************************************************************
  FLOW PROCESS FROM NODE   2481.00 TO NODE   2480.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1268.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.083
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.866
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE   2480.00 TO NODE   2482.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.00  DOWNSTREAM(FEET) =   1257.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   425.00   CHANNEL SLOPE =  0.0259
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.866
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.09
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   3.39
```

```
  Tc(MIN.) =   13.47
  SUBAREA AREA(ACRES) =     1.46       SUBAREA RUNOFF(CFS) =    1.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        1.6         PEAK FLOW RATE(CFS) =       1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE   2481.00 TO NODE   2482.00 =     505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2482.00 TO NODE   2482.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.47
  RAINFALL INTENSITY(INCH/HR) =   4.87
  TOTAL STREAM AREA(ACRES) =     1.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.92

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.48     8.26        6.674          3.90
      2        1.92    13.47        4.866          1.58

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.66     8.26       6.674
      2        6.65    13.47       4.866

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.66   Tc(MIN.) =    8.26
  TOTAL AREA(ACRES) =        5.5
  LONGEST FLOWPATH FROM NODE   2487.00 TO NODE   2482.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2482.00 TO NODE   2478.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1251.00  DOWNSTREAM(FEET) =  1247.00
  FLOW LENGTH(FEET) =   430.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.66
  PIPE TRAVEL TIME(MIN.) =   1.19    Tc(MIN.) =    9.44
  LONGEST FLOWPATH FROM NODE   2487.00 TO NODE   2478.00 =    1025.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2478.00 TO NODE   2478.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.44
  RAINFALL INTENSITY(INCH/HR) =   6.12
  TOTAL STREAM AREA(ACRES) =     5.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.66

****************************************************************************
  FLOW PROCESS FROM NODE   2477.00 TO NODE   2476.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1300.00
  DOWNSTREAM ELEVATION(FEET) =   1298.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.083
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.866
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.15

****************************************************************************
  FLOW PROCESS FROM NODE   2476.00 TO NODE   2475.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.00  DOWNSTREAM(FEET) =   1268.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.0732
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.915
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.44
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
 AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   3.18
 Tc(MIN.) =   13.26
 SUBAREA AREA(ACRES) =     0.48       SUBAREA RUNOFF(CFS) =    0.59
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
 TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       0.71

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   2.53
 LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2475.00 =     490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2475.00 TO NODE   2478.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1262.00  DOWNSTREAM(FEET) =  1247.00
 FLOW LENGTH(FEET) =   995.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.77
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.71
 PIPE TRAVEL TIME(MIN.) =   4.40    Tc(MIN.) =   17.66
 LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2478.00 =    1485.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2478.00 TO NODE   2478.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   17.66
 RAINFALL INTENSITY(INCH/HR) =   4.09
 TOTAL STREAM AREA(ACRES) =     0.58
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.71

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

```
     1        7.66     9.44        6.119          5.48
     2        0.71    17.66        4.086          0.58

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        8.04     9.44       6.119
     2        5.83    17.66       4.086

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.04   Tc(MIN.) =    9.44
  TOTAL AREA(ACRES) =        6.1
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2478.00 =    1485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2478.00 TO NODE   2515.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1247.00  DOWNSTREAM(FEET) =  1246.00
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.61
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.04
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    9.83
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2515.60 =    1615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2515.60 TO NODE   2515.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.83
  RAINFALL INTENSITY(INCH/HR) =   5.96
  TOTAL STREAM AREA(ACRES) =     6.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.04

****************************************************************************
  FLOW PROCESS FROM NODE   2515.80 TO NODE   2515.70 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1254.00
  DOWNSTREAM ELEVATION(FEET) =   1253.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.685
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.650
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.34

******************************************************************************
  FLOW PROCESS FROM NODE   2515.70 TO NODE   2515.60 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1253.00  DOWNSTREAM(FEET) =   1252.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   510.00   CHANNEL SLOPE =  0.0020
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.982
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.10
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   7.70
  Tc(MIN.) =   18.38
  SUBAREA AREA(ACRES) =     3.25       SUBAREA RUNOFF(CFS) =    3.24
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        3.5         PEAK FLOW RATE(CFS) =       3.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOW VELOCITY(FEET/SEC.) =   1.30
  LONGEST FLOWPATH FROM NODE   2515.80 TO NODE   2515.60 =     575.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2515.60 TO NODE   2515.60 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.38
```

```
  RAINFALL INTENSITY(INCH/HR) =   3.98
  TOTAL STREAM AREA(ACRES) =     3.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.04     9.83        5.963          6.06
      2        3.47    18.38        3.982          3.49

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.90     9.83       5.963
      2        8.84    18.38       3.982

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.90   Tc(MIN.) =    9.83
  TOTAL AREA(ACRES) =        9.6
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2515.60 =    1615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2515.60 TO NODE   2474.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1246.00  DOWNSTREAM(FEET) =  1244.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.26
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.90
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    9.90
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2474.00 =    1665.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2474.00 TO NODE   2473.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1244.00  DOWNSTREAM(FEET) =    978.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.00   CHANNEL SLOPE =  0.2780
```

```
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.465
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.79
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   1.35
  Tc(MIN.) =   11.25
  SUBAREA AREA(ACRES) =    10.53       SUBAREA RUNOFF(CFS) =   14.39
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =       20.1         PEAK FLOW RATE(CFS) =      27.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =  13.76
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2473.50 =    2620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2473.50 TO NODE   2473.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.25
  RAINFALL INTENSITY(INCH/HR) =   5.46
  TOTAL STREAM AREA(ACRES) =    20.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     27.43

****************************************************************************
  FLOW PROCESS FROM NODE   2488.00 TO NODE   2473.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1250.00
  DOWNSTREAM ELEVATION(FEET) =   1200.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.92
  TOTAL AREA(ACRES) =      0.50   TOTAL RUNOFF(CFS) =      0.92
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2473.00 TO NODE   2473.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =    978.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.2382
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.467
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.91
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =    8.67
  SUBAREA AREA(ACRES) =    12.02       SUBAREA RUNOFF(CFS) =   20.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.269
  TOTAL AREA(ACRES) =       12.5         PEAK FLOW RATE(CFS) =      21.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =  12.07
  LONGEST FLOWPATH FROM NODE   2488.00 TO NODE   2473.50 =    1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2473.50 TO NODE   2473.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.67
  RAINFALL INTENSITY(INCH/HR) =   6.47
  TOTAL STREAM AREA(ACRES) =    12.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.80

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       27.43    11.25        5.465         20.08
      2       21.80     8.67        6.467         12.52

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       44.98     8.67       6.467
      2       45.85    11.25       5.465

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      45.85   Tc(MIN.) =   11.25
  TOTAL AREA(ACRES) =       32.6
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2473.50 =    2620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2473.50 TO NODE   2472.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    978.50  DOWNSTREAM(FEET) =    976.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.0061
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.010
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.21
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =   12.88
  SUBAREA AREA(ACRES) =    13.37       SUBAREA RUNOFF(CFS) =   19.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.267
  TOTAL AREA(ACRES) =       46.0         PEAK FLOW RATE(CFS) =      61.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.02   FLOW VELOCITY(FEET/SEC.) =   4.33
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2472.00 =    3030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2472.00 TO NODE   2472.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       61.46    12.88       5.010       45.97
  LONGEST FLOWPATH FROM NODE   2477.00 TO NODE   2472.00 =    3030.00 FEET.
```

```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       97.15    15.71       4.407       35.72
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2472.00 =    4630.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     141.10      12.88        5.010
      2     151.22      15.71        4.407

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     151.22   Tc(MIN.) =   15.71
  TOTAL AREA(ACRES) =       81.7

****************************************************************************
  FLOW PROCESS FROM NODE   2472.00 TO NODE   2472.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2472.00 TO NODE   2472.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  15.71   RAIN INTENSITY(INCH/HOUR) =  4.41
  TOTAL AREA(ACRES) =    81.70   TOTAL RUNOFF(CFS) =     20.10

****************************************************************************
  FLOW PROCESS FROM NODE   2472.00 TO NODE   2471.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   970.00  DOWNSTREAM(FEET) =   920.00
  FLOW LENGTH(FEET) =   385.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.89
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.10
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   16.02
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2471.00 =    5015.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2471.00 TO NODE   2471.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.02
  RAINFALL INTENSITY(INCH/HR) =   4.35
  TOTAL STREAM AREA(ACRES) =    81.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.10

****************************************************************************
  FLOW PROCESS FROM NODE   2470.00 TO NODE   2469.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1030.00
  DOWNSTREAM ELEVATION(FEET) =   1024.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.420
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.589
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.59   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE   2469.00 TO NODE   2471.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1024.00  DOWNSTREAM(FEET) =    934.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.00   CHANNEL SLOPE =  0.0973
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.139
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.89
  AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   12.38
  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    1.67
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        1.9         PEAK FLOW RATE(CFS) =       2.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   4.42
  LONGEST FLOWPATH FROM NODE   2470.00 TO NODE   2471.00 =    1025.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2471.00 TO NODE   2471.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.38
  RAINFALL INTENSITY(INCH/HR) =   5.14
  TOTAL STREAM AREA(ACRES) =     1.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.43

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.10    16.02        4.352         81.70
      2        2.43    12.38        5.139          1.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       17.96    12.38       5.139
      2       22.16    16.02       4.352

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.16   Tc(MIN.) =   16.02
  TOTAL AREA(ACRES) =       83.6
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2471.00 =    5015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2471.00 TO NODE   2459.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   928.00  DOWNSTREAM(FEET) =   914.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.16
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   16.22
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2459.00 =    5215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2459.00 TO NODE   2459.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2468.00 TO NODE   2467.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1255.00
  DOWNSTREAM ELEVATION(FEET) =   1197.00
  ELEVATION DIFFERENCE(FEET) =     58.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE   2467.00 TO NODE   2460.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1197.00  DOWNSTREAM(FEET) =    923.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1265.00   CHANNEL SLOPE =  0.2166
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.855
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.01
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   3.01
```

```
  Tc(MIN.) =   10.11
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =    7.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        5.5         PEAK FLOW RATE(CFS) =       8.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   8.59
  LONGEST FLOWPATH FROM NODE   2468.00 TO NODE   2460.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2460.00 TO NODE   2460.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2465.00 TO NODE   2464.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1225.00
  DOWNSTREAM ELEVATION(FEET) =   1215.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   2464.00 TO NODE   2463.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1215.00  DOWNSTREAM(FEET) =    912.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2135.00   CHANNEL SLOPE =  0.1419
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.112
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.71
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   5.38
  Tc(MIN.) =   12.48
  SUBAREA AREA(ACRES) =     7.44       SUBAREA RUNOFF(CFS) =    9.51
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        7.9         PEAK FLOW RATE(CFS) =      10.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   8.05
  LONGEST FLOWPATH FROM NODE   2465.00 TO NODE   2463.00 =    2235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2463.00 TO NODE   2463.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.48
  RAINFALL INTENSITY(INCH/HR) =   5.11
  TOTAL STREAM AREA(ACRES) =     7.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.08

****************************************************************************
  FLOW PROCESS FROM NODE   2462.00 TO NODE   2461.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    925.00
  DOWNSTREAM ELEVATION(FEET) =    923.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.955
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   2461.00 TO NODE   2463.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  923.00  DOWNSTREAM ELEVATION(FEET) =  916.00
  STREET LENGTH(FEET) =   590.00   CURB HEIGHT(INCHES) =  6.0
```

```
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.20
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.85
  STREET FLOW TRAVEL TIME(MIN.) =   3.89   Tc(MIN.) =   10.18
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.829
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    3.38      SUBAREA RUNOFF(CFS) =   11.23
  TOTAL AREA(ACRES) =        3.5        PEAK FLOW RATE(CFS) =      11.60

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.66
  FLOW VELOCITY(FEET/SEC.) =  2.92   DEPTH*VELOCITY(FT*FT/SEC.) =   1.17
  LONGEST FLOWPATH FROM NODE   2462.00 TO NODE   2463.00 =     670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2463.00 TO NODE   2463.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.18
  RAINFALL INTENSITY(INCH/HR) =   5.83
  TOTAL STREAM AREA(ACRES) =     3.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.08    12.48        5.112          7.89
```

```
    2       11.60    10.18        5.829          3.49

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.82    10.18       5.829
      2       20.25    12.48       5.112

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.25   Tc(MIN.) =   12.48
  TOTAL AREA(ACRES) =       11.4
  LONGEST FLOWPATH FROM NODE   2465.00 TO NODE   2463.00 =    2235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2463.00 TO NODE   2460.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   913.00  DOWNSTREAM(FEET) =   912.00
  FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.84
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.25
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   13.12
  LONGEST FLOWPATH FROM NODE   2465.00 TO NODE   2460.00 =    2460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2460.00 TO NODE   2460.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       20.25    13.12       4.949       11.38
  LONGEST FLOWPATH FROM NODE   2465.00 TO NODE   2460.00 =    2460.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        8.01    10.11       5.855        5.47
  LONGEST FLOWPATH FROM NODE   2468.00 TO NODE   2460.00 =    1365.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      23.61      10.11        5.855
      2      27.02      13.12        4.949

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      27.02   Tc(MIN.) =   13.12
  TOTAL AREA(ACRES) =       16.9

****************************************************************************
  FLOW PROCESS FROM NODE   2460.00 TO NODE   2460.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2460.00 TO NODE   2459.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   912.00  DOWNSTREAM(FEET) =   911.00
  FLOW LENGTH(FEET) =   145.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.37
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.02
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   13.45
  LONGEST FLOWPATH FROM NODE   2465.00 TO NODE   2459.00 =    2605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2459.00 TO NODE   2459.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       27.02    13.45        4.871       16.85
  LONGEST FLOWPATH FROM NODE   2465.00 TO NODE   2459.00 =    2605.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       22.16    16.22        4.317       83.59
```

```
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2459.00 =    5215.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      45.40      13.45        4.871
      2      46.11      16.22        4.317

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      46.11   Tc(MIN.) =   16.22
  TOTAL AREA(ACRES) =      100.4

****************************************************************************
  FLOW PROCESS FROM NODE   2459.00 TO NODE   2459.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2459.00 TO NODE   2458.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   911.00  DOWNSTREAM(FEET) =   905.00
  FLOW LENGTH(FEET) =   635.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.34
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      46.11
  PIPE TRAVEL TIME(MIN.) =   1.13    Tc(MIN.) =   17.35
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2458.00 =    5850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2458.00 TO NODE   2458.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2457.00 TO NODE   2456.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
```

```
  UPSTREAM ELEVATION(FEET) =    920.00
  DOWNSTREAM ELEVATION(FEET) =    917.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
  SUBAREA RUNOFF(CFS) =      0.86
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.86

****************************************************************************
  FLOW PROCESS FROM NODE   2456.00 TO NODE   2456.10 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  917.00  DOWNSTREAM ELEVATION(FEET) =  910.00
  STREET LENGTH(FEET) =   355.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
  STREET FLOW TRAVEL TIME(MIN.) =   1.74   Tc(MIN.) =    8.08
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    2.02      SUBAREA RUNOFF(CFS) =    7.79
  TOTAL AREA(ACRES) =        2.2        PEAK FLOW RATE(CFS) =       8.52

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.41
  FLOW VELOCITY(FEET/SEC.) =  3.89   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2456.10 =     450.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2456.10 TO NODE   2455.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   904.00  DOWNSTREAM(FEET) =   897.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.86
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.52
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =    8.65
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2455.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2455.00 TO NODE   2455.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.65
  RAINFALL INTENSITY(INCH/HR) =   6.48
  TOTAL STREAM AREA(ACRES) =     2.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.52

****************************************************************************
  FLOW PROCESS FROM NODE   2456.20 TO NODE   2456.30 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =    912.00
  DOWNSTREAM ELEVATION(FEET) =    909.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.059
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.147
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE   2456.30 TO NODE   2455.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  909.00  DOWNSTREAM ELEVATION(FEET) =  903.00
  STREET LENGTH(FEET) =   245.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.05
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.73
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.30
  STREET FLOW TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =    7.15
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.319
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    4.61      SUBAREA RUNOFF(CFS) =   19.23
  TOTAL AREA(ACRES) =        4.7        PEAK FLOW RATE(CFS) =      19.61

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.59
  FLOW VELOCITY(FEET/SEC.) =  4.36   DEPTH*VELOCITY(FT*FT/SEC.) =   1.82
  LONGEST FLOWPATH FROM NODE   2456.20 TO NODE   2455.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2455.00 TO NODE   2455.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.15
  RAINFALL INTENSITY(INCH/HR) =   7.32
  TOTAL STREAM AREA(ACRES) =     4.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.61
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.52     8.65        6.477          2.21
      2       19.61     7.15        7.319          4.70

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.66     7.15       7.319
      2       25.87     8.65       6.477

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.66   Tc(MIN.) =    7.15
  TOTAL AREA(ACRES) =        6.9
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2455.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2455.00 TO NODE   2454.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   897.00  DOWNSTREAM(FEET) =   896.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.05
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.66
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    7.53
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2454.00 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2454.00 TO NODE   2453.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    902.00  DOWNSTREAM(FEET) =    901.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    35.00   CHANNEL SLOPE =  0.0286
  CHANNEL FLOW THRU SUBAREA(CFS) =      26.66
  FLOW VELOCITY(FEET/SEC) =   5.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =    7.64
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2453.00 =     945.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2453.00 TO NODE   2458.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   901.00  DOWNSTREAM(FEET) =   900.00
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.49
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.66
  PIPE TRAVEL TIME(MIN.) =   1.91    Tc(MIN.) =    9.55
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2458.00 =    1460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2458.00 TO NODE   2458.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       26.66     9.55       6.075        6.91
  LONGEST FLOWPATH FROM NODE   2457.00 TO NODE   2458.00 =    1460.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       46.11    17.35       4.133      100.44
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2458.00 =    5850.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      52.04       9.55        6.075
      2      64.24      17.35        4.133

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      64.24   Tc(MIN.) =   17.35
  TOTAL AREA(ACRES) =      107.3

****************************************************************************
  FLOW PROCESS FROM NODE   2458.00 TO NODE   2458.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2458.00 TO NODE   2452.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   902.00  DOWNSTREAM(FEET) =   896.00
  FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.24
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.24
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   17.75
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2452.00 =    6165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2452.00 TO NODE   2452.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.75
  RAINFALL INTENSITY(INCH/HR) =   4.07
  TOTAL STREAM AREA(ACRES) =   107.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     64.24

****************************************************************************
  FLOW PROCESS FROM NODE   2451.00 TO NODE   2450.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1185.00
  DOWNSTREAM ELEVATION(FEET) =   1150.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   2450.00 TO NODE   2449.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   615.00   CHANNEL SLOPE =  0.3089
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.751
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.18
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.01
  Tc(MIN.) =    8.11
  SUBAREA AREA(ACRES) =    10.64       SUBAREA RUNOFF(CFS) =   17.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =       10.9          PEAK FLOW RATE(CFS) =      18.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =  12.64
  LONGEST FLOWPATH FROM NODE   2451.00 TO NODE   2449.00 =     715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2449.00 TO NODE   2452.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   954.00  DOWNSTREAM(FEET) =   896.00
  FLOW LENGTH(FEET) =   820.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.20
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.41
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =    8.95
  LONGEST FLOWPATH FROM NODE   2451.00 TO NODE   2452.00 =    1535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2452.00 TO NODE   2452.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.95
```

```
  RAINFALL INTENSITY(INCH/HR) =   6.33
  TOTAL STREAM AREA(ACRES) =    10.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       64.24    17.75        4.073        107.35
      2       18.41     8.95        6.334         10.91

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       50.82     8.95       6.334
      2       76.09    17.75       4.073

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      76.09   Tc(MIN.) =   17.75
  TOTAL AREA(ACRES) =      118.3
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2452.00 =    6165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2452.00 TO NODE   2448.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.00  DOWNSTREAM(FEET) =   889.00
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.25
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      76.09
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   17.95
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2448.00 =    6375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2448.00 TO NODE   2448.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2447.00 TO NODE   2446.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    67.65
  UPSTREAM ELEVATION(FEET) =    912.00
  DOWNSTREAM ELEVATION(FEET) =    911.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.888
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.500
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.38

********************************************************************************
  FLOW PROCESS FROM NODE   2446.00 TO NODE   2445.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    911.00  DOWNSTREAM(FEET) =    900.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.00   CHANNEL SLOPE =  0.0177
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.781
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.02
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   10.31
  SUBAREA AREA(ACRES) =     2.40       SUBAREA RUNOFF(CFS) =    7.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       8.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   3.67
  LONGEST FLOWPATH FROM NODE   2447.00 TO NODE   2445.00 =     687.65 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   2445.00 TO NODE   2445.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.31
```

```
  RAINFALL INTENSITY(INCH/HR) =   5.78
  TOTAL STREAM AREA(ACRES) =     2.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.21

****************************************************************************
  FLOW PROCESS FROM NODE   2444.00 TO NODE   2443.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.33
  UPSTREAM ELEVATION(FEET) =    912.00
  DOWNSTREAM ELEVATION(FEET) =    910.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.505
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.782
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE   2443.00 TO NODE   2445.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  910.00  DOWNSTREAM ELEVATION(FEET) =  900.00
  STREET LENGTH(FEET) =   700.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.91
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
  STREET FLOW TRAVEL TIME(MIN.) =   4.81   Tc(MIN.) =   11.31
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.446
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    3.23
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       3.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.59
  FLOW VELOCITY(FEET/SEC.) =  2.75   DEPTH*VELOCITY(FT*FT/SEC.) =   0.93
  LONGEST FLOWPATH FROM NODE   2444.00 TO NODE   2445.00 =     783.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2445.00 TO NODE   2445.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.31
  RAINFALL INTENSITY(INCH/HR) =   5.45
  TOTAL STREAM AREA(ACRES) =     1.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.21    10.31        5.781          2.49
      2        3.41    11.31        5.446          1.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.32    10.31       5.781
      2       11.14    11.31       5.446

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.32   Tc(MIN.) =   10.31
  TOTAL AREA(ACRES) =        3.6
  LONGEST FLOWPATH FROM NODE   2444.00 TO NODE   2445.00 =     783.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2445.00 TO NODE   2448.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   894.00  DOWNSTREAM(FEET) =   889.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.09
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.32
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   10.40
  LONGEST FLOWPATH FROM NODE   2444.00 TO NODE   2448.00 =     858.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2448.00 TO NODE   2448.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       11.32    10.40       5.749        3.59
  LONGEST FLOWPATH FROM NODE   2444.00 TO NODE   2448.00 =     858.33 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       76.09    17.95       4.044      118.26
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2448.00 =    6375.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      55.41      10.40        5.749
      2      84.05      17.95        4.044

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.05   Tc(MIN.) =   17.95
  TOTAL AREA(ACRES) =      121.8

****************************************************************************
  FLOW PROCESS FROM NODE   2448.00 TO NODE   2448.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2448.00 TO NODE   2442.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   889.00  DOWNSTREAM(FEET) =   888.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.39
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      84.05
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   18.01
 LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2442.00 =    6425.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2442.00 TO NODE   2442.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   18.01
 RAINFALL INTENSITY(INCH/HR) =   4.04
 TOTAL STREAM AREA(ACRES) =   121.85
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     84.05

****************************************************************************
 FLOW PROCESS FROM NODE   2441.00 TO NODE   2440.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =    908.00
 DOWNSTREAM ELEVATION(FEET) =    905.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE   2440.00 TO NODE   2439.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    905.00  DOWNSTREAM(FEET) =    895.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   315.00   CHANNEL SLOPE =  0.0317
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.882
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.42
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =    7.87
  SUBAREA AREA(ACRES) =     1.57       SUBAREA RUNOFF(CFS) =    6.16
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =        1.7         PEAK FLOW RATE(CFS) =       6.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE   2441.00 TO NODE   2439.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2439.00 TO NODE   2442.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   889.00  DOWNSTREAM(FEET) =   888.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.61
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.59
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    8.23
  LONGEST FLOWPATH FROM NODE   2441.00 TO NODE   2442.00 =     530.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2442.00 TO NODE   2442.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.23
  RAINFALL INTENSITY(INCH/HR) =   6.69
  TOTAL STREAM AREA(ACRES) =     1.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.59
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       84.05    18.01        4.035        121.85
      2        6.59     8.23        6.688          1.68

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       44.99     8.23       6.688
      2       88.02    18.01       4.035

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      88.02   Tc(MIN.) =   18.01
  TOTAL AREA(ACRES) =      123.5
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2442.00 =    6425.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2442.00 TO NODE   2438.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   888.00  DOWNSTREAM(FEET) =   887.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.43
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      88.02
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   18.06
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2438.00 =    6475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2438.00 TO NODE   2438.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.06
  RAINFALL INTENSITY(INCH/HR) =   4.03
  TOTAL STREAM AREA(ACRES) =   123.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     88.02
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2437.00 TO NODE   2436.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    897.00
  DOWNSTREAM ELEVATION(FEET) =    895.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.955
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
  FLOW PROCESS FROM NODE   2436.00 TO NODE   2435.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  895.00  DOWNSTREAM ELEVATION(FEET) =  894.00
  STREET LENGTH(FEET) =   300.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.19
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.35
  STREET FLOW TRAVEL TIME(MIN.) =   4.18   Tc(MIN.) =   10.47
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.724
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
```

```
  SUBAREA AREA(ACRES) =    0.86      SUBAREA RUNOFF(CFS) =    2.81
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.47
  FLOW VELOCITY(FEET/SEC.) =  1.33   DEPTH*VELOCITY(FT*FT/SEC.) =   0.45
  LONGEST FLOWPATH FROM NODE   2437.00 TO NODE   2435.00 =     380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2435.00 TO NODE   2438.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   888.00  DOWNSTREAM(FEET) =   887.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.86
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.23
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   10.85
  LONGEST FLOWPATH FROM NODE   2437.00 TO NODE   2438.00 =     490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2438.00 TO NODE   2438.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.85
  RAINFALL INTENSITY(INCH/HR) =   5.60
  TOTAL STREAM AREA(ACRES) =     0.99
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       88.02    18.06        4.027        123.53
      2        3.23    10.85        5.595          0.99

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       66.58    10.85       5.595
      2       90.35    18.06       4.027

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      90.35   Tc(MIN.) =   18.06
  TOTAL AREA(ACRES) =      124.5
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2438.00 =    6475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2438.00 TO NODE   2434.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   889.00  DOWNSTREAM(FEET) =   887.00
  FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  35.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.19
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      90.35
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   18.71
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2434.00 =    6830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2434.00 TO NODE   2434.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.71
  RAINFALL INTENSITY(INCH/HR) =   3.94
  TOTAL STREAM AREA(ACRES) =   124.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     90.35

****************************************************************************
  FLOW PROCESS FROM NODE   2433.00 TO NODE   2432.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    903.00
  DOWNSTREAM ELEVATION(FEET) =    899.00
  ELEVATION DIFFERENCE(FEET) =      4.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.759
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.419
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE   2432.00 TO NODE   2431.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    899.00  DOWNSTREAM(FEET) =    896.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   510.00   CHANNEL SLOPE =  0.0059
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.072
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.24
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =    9.56
  SUBAREA AREA(ACRES) =     2.93       SUBAREA RUNOFF(CFS) =   10.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =        3.1         PEAK FLOW RATE(CFS) =      10.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   2.67
  LONGEST FLOWPATH FROM NODE   2433.00 TO NODE   2431.00 =     605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2431.00 TO NODE   2434.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   890.00  DOWNSTREAM(FEET) =   889.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.87
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.66
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    9.69
  LONGEST FLOWPATH FROM NODE   2433.00 TO NODE   2434.00 =     670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2434.00 TO NODE   2434.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.69
  RAINFALL INTENSITY(INCH/HR) =   6.02
  TOTAL STREAM AREA(ACRES) =     3.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.66

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       90.35    18.71        3.937        124.52
      2       10.66     9.69        6.016          3.08

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       69.78     9.69       6.016
      2       97.32    18.71       3.937

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      97.32   Tc(MIN.) =   18.71
  TOTAL AREA(ACRES) =      127.6
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2434.00 =    6830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2434.00 TO NODE   2430.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   889.00  DOWNSTREAM(FEET) =   888.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.75
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      97.32
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   18.76
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2430.00 =    6875.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2430.00 TO NODE   2430.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.76
  RAINFALL INTENSITY(INCH/HR) =   3.93
  TOTAL STREAM AREA(ACRES) =   127.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     97.32

************************************************************************
  FLOW PROCESS FROM NODE   2429.00 TO NODE   2428.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1290.00
  DOWNSTREAM ELEVATION(FEET) =   1235.00
  ELEVATION DIFFERENCE(FEET) =     55.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.53

************************************************************************
  FLOW PROCESS FROM NODE   2428.00 TO NODE   2427.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.00  DOWNSTREAM(FEET) =    910.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   710.00   CHANNEL SLOPE =  0.4577
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.875
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.15
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   0.78
  Tc(MIN.) =    7.88
  SUBAREA AREA(ACRES) =    23.50       SUBAREA RUNOFF(CFS) =   42.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.260
```

```
  TOTAL AREA(ACRES) =       23.8          PEAK FLOW RATE(CFS) =      42.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =  18.67
  LONGEST FLOWPATH FROM NODE   2429.00 TO NODE   2427.00 =     810.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2427.00 TO NODE   2430.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   904.00  DOWNSTREAM(FEET) =   888.00
  FLOW LENGTH(FEET) =   395.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.67
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.50
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    8.30
  LONGEST FLOWPATH FROM NODE   2429.00 TO NODE   2430.00 =    1205.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2430.00 TO NODE   2430.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.30
  RAINFALL INTENSITY(INCH/HR) =   6.65
  TOTAL STREAM AREA(ACRES) =    23.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.50

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       97.32    18.76        3.931        127.60
      2       42.50     8.30        6.648         23.79

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      100.04     8.30       6.648
      2      122.45    18.76       3.931
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     122.45   Tc(MIN.) =   18.76
  TOTAL AREA(ACRES) =      151.4
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2430.00 =    6875.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2430.00 TO NODE   2391.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   888.00  DOWNSTREAM(FEET) =   877.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.81
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     122.45
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   19.13
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2391.00 =    7275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2391.00 TO NODE   2391.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2417.00 TO NODE   2416.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =    906.00
  DOWNSTREAM ELEVATION(FEET) =    905.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.663
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.663
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE   2416.00 TO NODE   2415.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  905.00  DOWNSTREAM ELEVATION(FEET) =  895.00
  STREET LENGTH(FEET) =   325.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.85
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.26
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =    8.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.639
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.88      SUBAREA RUNOFF(CFS) =    7.11
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       7.34

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.24
  FLOW VELOCITY(FEET/SEC.) =  3.78   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
  LONGEST FLOWPATH FROM NODE   2417.00 TO NODE   2415.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.00 TO NODE   2414.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   889.00  DOWNSTREAM(FEET) =   888.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.34
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    8.85
```

```
 LONGEST FLOWPATH FROM NODE   2417.00 TO NODE   2414.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2414.00 TO NODE   2414.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2400.00 TO NODE   2399.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .8900
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1000.00
 DOWNSTREAM ELEVATION(FEET) =    987.00
 ELEVATION DIFFERENCE(FEET) =     13.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.755
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.23
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      1.23

****************************************************************************
 FLOW PROCESS FROM NODE   2399.00 TO NODE   2398.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  987.00  DOWNSTREAM ELEVATION(FEET) =  940.00
 STREET LENGTH(FEET) =   445.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.02
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    4.99
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
  STREET FLOW TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =    3.11
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.890
  SUBAREA AREA(ACRES) =    0.68      SUBAREA RUNOFF(CFS) =    5.58
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       6.81

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.71
  FLOW VELOCITY(FEET/SEC.) =  5.99   DEPTH*VELOCITY(FT*FT/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2398.00 =     545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2398.00 TO NODE   2397.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   934.00  DOWNSTREAM(FEET) =   908.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.19
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.81
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    3.65
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2397.00 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2397.00 TO NODE   2397.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.65
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.81

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2396.00 TO NODE   2395.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    940.00
 DOWNSTREAM ELEVATION(FEET) =    930.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.428
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.95
 TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.95

****************************************************************************
 FLOW PROCESS FROM NODE   2395.00 TO NODE   2397.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  930.00  DOWNSTREAM ELEVATION(FEET) =  916.00
 STREET LENGTH(FEET) =   285.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.95
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    3.92
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
 STREET FLOW TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =    5.75
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.425
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.42      SUBAREA RUNOFF(CFS) =    2.02
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.88

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   5.12
  FLOW VELOCITY(FEET/SEC.) =  3.79   DEPTH*VELOCITY(FT*FT/SEC.) =   0.87
  LONGEST FLOWPATH FROM NODE   2396.00 TO NODE   2397.00 =     385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2397.00 TO NODE   2397.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.75
  RAINFALL INTENSITY(INCH/HR) =   8.42
  TOTAL STREAM AREA(ACRES) =     0.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.88

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.81     3.65        9.222          0.83
      2        2.88     5.75        8.425          0.60

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.64     3.65       9.222
      2        9.10     5.75       8.425

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.10   Tc(MIN.) =    5.75
  TOTAL AREA(ACRES) =        1.4
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2397.00 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2397.00 TO NODE   2394.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   910.00  DOWNSTREAM(FEET) =   894.00
  FLOW LENGTH(FEET) =   455.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.51
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.10
  PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =    6.47
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2394.00 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2394.00 TO NODE   2394.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.47
  RAINFALL INTENSITY(INCH/HR) =   7.81
  TOTAL STREAM AREA(ACRES) =     1.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.10

****************************************************************************
  FLOW PROCESS FROM NODE   2393.00 TO NODE   2392.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.50
  UPSTREAM ELEVATION(FEET) =    916.00
  DOWNSTREAM ELEVATION(FEET) =    912.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.885
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.302
  SUBAREA RUNOFF(CFS) =      0.90
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.90

****************************************************************************
  FLOW PROCESS FROM NODE   2392.00 TO NODE   2394.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  912.00  DOWNSTREAM ELEVATION(FEET) =  900.00
  STREET LENGTH(FEET) =   365.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.00
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    4.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.65
  STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =    7.93
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.851
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.56      SUBAREA RUNOFF(CFS) =    2.19
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       2.93

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.85
  FLOW VELOCITY(FEET/SEC.) =  3.18   DEPTH*VELOCITY(FT*FT/SEC.) =   0.77
  LONGEST FLOWPATH FROM NODE   2393.00 TO NODE   2394.00 =     462.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2394.00 TO NODE   2394.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.93
  RAINFALL INTENSITY(INCH/HR) =   6.85
  TOTAL STREAM AREA(ACRES) =     0.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.93

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.10     6.47        7.806          1.43
      2        2.93     7.93        6.851          0.75
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.50     6.47       7.806
      2       10.92     7.93       6.851

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.50   Tc(MIN.) =    6.47
  TOTAL AREA(ACRES) =        2.2
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2394.00 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2394.00 TO NODE   2414.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   894.00  DOWNSTREAM(FEET) =   888.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.36
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.50
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    6.60
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2414.00 =    1505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2414.00 TO NODE   2414.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       11.50     6.60       7.706        2.18
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2414.00 =    1505.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.34     8.85       6.381        1.94
  LONGEST FLOWPATH FROM NODE   2417.00 TO NODE   2414.00 =     550.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      16.98       6.60        7.706
      2      16.86       8.85        6.381

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.98   Tc(MIN.) =    6.60
  TOTAL AREA(ACRES) =        4.1

****************************************************************************
  FLOW PROCESS FROM NODE   2414.00 TO NODE   2414.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2414.00 TO NODE   2391.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    894.00  DOWNSTREAM(FEET) =    883.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   320.00   CHANNEL SLOPE =  0.0344
  CHANNEL FLOW THRU SUBAREA(CFS) =      16.98
  FLOW VELOCITY(FEET/SEC) =   5.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.00   Tc(MIN.) =    7.61
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2391.00 =    1825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2391.00 TO NODE   2391.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       16.98      7.61        7.035        4.12
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2391.00 =    1825.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1      122.45     19.13        3.881      151.39
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2391.00 =    7275.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      65.67       7.61        7.035
      2     131.82      19.13        3.881

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     131.82   Tc(MIN.) =   19.13
  TOTAL AREA(ACRES) =      155.5

****************************************************************************
  FLOW PROCESS FROM NODE   2391.00 TO NODE   2391.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2391.00 TO NODE   2418.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   877.00  DOWNSTREAM(FEET) =   869.00
  FLOW LENGTH(FEET) =   267.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.62
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     131.82
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   19.37
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2418.00 =    7542.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2418.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2425.00 TO NODE   2424.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1198.00
  DOWNSTREAM ELEVATION(FEET) =   1135.00
```

```
  ELEVATION DIFFERENCE(FEET) =     63.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.96
  TOTAL AREA(ACRES) =      0.52   TOTAL RUNOFF(CFS) =      0.96

****************************************************************************
  FLOW PROCESS FROM NODE   2424.00 TO NODE   2423.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    926.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   715.00   CHANNEL SLOPE =  0.2923
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.550
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   1.40
  Tc(MIN.) =    8.50
  SUBAREA AREA(ACRES) =     6.25       SUBAREA RUNOFF(CFS) =   10.23
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        6.8         PEAK FLOW RATE(CFS) =      11.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =  10.48
  LONGEST FLOWPATH FROM NODE   2425.00 TO NODE   2423.00 =     815.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2423.00 TO NODE   2422.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   920.00  DOWNSTREAM(FEET) =   891.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.52
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.09
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.54
  LONGEST FLOWPATH FROM NODE   2425.00 TO NODE   2422.50 =     890.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2422.50 TO NODE   2422.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.54
  RAINFALL INTENSITY(INCH/HR) =   6.53
  TOTAL STREAM AREA(ACRES) =     6.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.09

****************************************************************************
  FLOW PROCESS FROM NODE   2422.70 TO NODE   2422.60 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    914.00
  DOWNSTREAM ELEVATION(FEET) =    912.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.083
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.866
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE   2422.60 TO NODE   2422.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    912.00  DOWNSTREAM(FEET) =    897.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00   CHANNEL SLOPE =  0.0273
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.433
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.67
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   5.48
  Tc(MIN.) =   15.57
```

```
  SUBAREA AREA(ACRES) =     0.53       SUBAREA RUNOFF(CFS) =    0.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.291
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   2.00
  LONGEST FLOWPATH FROM NODE   2422.70 TO NODE   2422.50 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.50 TO NODE   2422.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.57
  RAINFALL INTENSITY(INCH/HR) =   4.43
  TOTAL STREAM AREA(ACRES) =     0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.09     8.54        6.527          6.77
      2        0.83    15.57        4.433          0.64

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.54     8.54       6.527
      2        8.36    15.57       4.433

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.54   Tc(MIN.) =    8.54
  TOTAL AREA(ACRES) =        7.4
  LONGEST FLOWPATH FROM NODE   2425.00 TO NODE   2422.50 =     890.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.50 TO NODE   2422.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   891.00  DOWNSTREAM(FEET) =   881.00
```

```
  FLOW LENGTH(FEET) =   350.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.27
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.54
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =    9.11
  LONGEST FLOWPATH FROM NODE   2425.00 TO NODE   2422.00 =    1240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.00 TO NODE   2422.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1185.00
  DOWNSTREAM ELEVATION(FEET) =   1143.00
  ELEVATION DIFFERENCE(FEET) =     42.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      1.03
  TOTAL AREA(ACRES) =      0.56   TOTAL RUNOFF(CFS) =      1.03

****************************************************************************
  FLOW PROCESS FROM NODE   2420.00 TO NODE   2419.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.00  DOWNSTREAM(FEET) =    918.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   765.00   CHANNEL SLOPE =  0.2941
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.428
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.74
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =    8.75
  SUBAREA AREA(ACRES) =     4.46       SUBAREA RUNOFF(CFS) =    7.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        5.0         PEAK FLOW RATE(CFS) =       8.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   9.35
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2419.00 =     865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2419.00 TO NODE   2422.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   912.00  DOWNSTREAM(FEET) =   885.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.07
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    8.81
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2422.20 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.20 TO NODE   2422.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.81
  RAINFALL INTENSITY(INCH/HR) =   6.40
  TOTAL STREAM AREA(ACRES) =     5.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.07

****************************************************************************
  FLOW PROCESS FROM NODE   2422.60 TO NODE   2422.40 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    897.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    895.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.490
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.100
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE   2422.40 TO NODE   2422.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    895.00  DOWNSTREAM(FEET) =    891.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   145.00   CHANNEL SLOPE =  0.0276
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.567
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.67
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   1.44
  Tc(MIN.) =   10.93
  SUBAREA AREA(ACRES) =     0.31       SUBAREA RUNOFF(CFS) =    0.52
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.95
  LONGEST FLOWPATH FROM NODE   2422.60 TO NODE   2422.20 =     225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.20 TO NODE   2422.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.93
  RAINFALL INTENSITY(INCH/HR) =   5.57
  TOTAL STREAM AREA(ACRES) =     0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.07     8.81        6.400          5.02
      2        0.75    10.93        5.567          0.45

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.67     8.81       6.400
      2        7.77    10.93       5.567

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.67   Tc(MIN.) =    8.81
  TOTAL AREA(ACRES) =        5.5
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2422.20 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.20 TO NODE   2422.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   885.00  DOWNSTREAM(FEET) =   881.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.35
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.67
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =    9.86
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2422.00 =    1345.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2422.00 TO NODE   2422.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        8.67     9.86       5.952        5.47
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2422.00 =    1345.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
```

```
     1       11.54     9.11       6.261        7.41
  LONGEST FLOWPATH FROM NODE   2425.00 TO NODE   2422.00 =    1240.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      19.56       9.11        6.261
     2      19.64       9.86        5.952

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.64   Tc(MIN.) =    9.86
  TOTAL AREA(ACRES) =       12.9

****************************************************************************
  FLOW PROCESS FROM NODE   2422.00 TO NODE   2422.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2422.00 TO NODE   2418.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   881.00  DOWNSTREAM(FEET) =   869.00
  FLOW LENGTH(FEET) =   690.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  17.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.39
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.64
  PIPE TRAVEL TIME(MIN.) =   1.22    Tc(MIN.) =   11.08
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2418.00 =    2035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2418.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       19.64    11.08       5.519       12.88
  LONGEST FLOWPATH FROM NODE   2421.00 TO NODE   2418.00 =    2035.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      131.82    19.37       3.850      155.51
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2418.00 =    7542.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      95.06      11.08        5.519
      2     145.52      19.37        3.850

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     145.52   Tc(MIN.) =   19.37
  TOTAL AREA(ACRES) =      168.4

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2418.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2418.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2418.90 TO NODE   2418.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    922.00
  DOWNSTREAM ELEVATION(FEET) =    920.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.999
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE   2418.80 TO NODE   2418.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
```

```
================================================================================
  UPSTREAM ELEVATION(FEET) =  920.00  DOWNSTREAM ELEVATION(FEET) =  907.00
  STREET LENGTH(FEET) =   660.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   3.78   Tc(MIN.) =   10.78
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.617
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.510
  SUBAREA AREA(ACRES) =    2.71      SUBAREA RUNOFF(CFS) =    7.76
  TOTAL AREA(ACRES) =        3.0        PEAK FLOW RATE(CFS) =       8.45

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.78
  FLOW VELOCITY(FEET/SEC.) =  3.30   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  LONGEST FLOWPATH FROM NODE   2418.90 TO NODE   2418.20 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.20 TO NODE   2418.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.78
  RAINFALL INTENSITY(INCH/HR) =   5.62
  TOTAL STREAM AREA(ACRES) =     2.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.45

****************************************************************************
  FLOW PROCESS FROM NODE   2417.84 TO NODE   2417.85 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    919.00
  DOWNSTREAM ELEVATION(FEET) =    918.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.087
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.364
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE   2417.85 TO NODE   2418.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  918.00  DOWNSTREAM ELEVATION(FEET) =  907.00
  STREET LENGTH(FEET) =  1005.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
  STREET FLOW TRAVEL TIME(MIN.) =   6.91   Tc(MIN.) =   14.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.748
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    3.99      SUBAREA RUNOFF(CFS) =   10.80
  TOTAL AREA(ACRES) =        4.1        PEAK FLOW RATE(CFS) =      11.01
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.59
  FLOW VELOCITY(FEET/SEC.) =  2.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.12
  LONGEST FLOWPATH FROM NODE   2417.84 TO NODE   2418.20 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.20 TO NODE   2418.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.00
  RAINFALL INTENSITY(INCH/HR) =   4.75
  TOTAL STREAM AREA(ACRES) =     4.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.45    10.78        5.617          2.95
      2       11.01    14.00        4.748          4.07

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.94    10.78       5.617
      2       18.16    14.00       4.748

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.16   Tc(MIN.) =   14.00
  TOTAL AREA(ACRES) =        7.0
  LONGEST FLOWPATH FROM NODE   2417.84 TO NODE   2418.20 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.20 TO NODE   2418.70 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    907.00  DOWNSTREAM(FEET) =    902.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   425.00   CHANNEL SLOPE =  0.0118
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
```

```
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.399
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.04
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =   15.75
  SUBAREA AREA(ACRES) =     0.69       SUBAREA RUNOFF(CFS) =    1.73
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.547
  TOTAL AREA(ACRES) =        7.7         PEAK FLOW RATE(CFS) =      18.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   3.99
  LONGEST FLOWPATH FROM NODE   2417.84 TO NODE   2418.70 =    1500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.70 TO NODE   2418.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.00  DOWNSTREAM(FEET) =   890.00
  FLOW LENGTH(FEET) =   145.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.01
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.56
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   15.94
  LONGEST FLOWPATH FROM NODE   2417.84 TO NODE   2418.60 =    1645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.60 TO NODE   2418.60 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2418.50 TO NODE   2418.40 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1105.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1055.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE   2418.40 TO NODE   2418.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =    909.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.3561
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.845
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.20
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   0.83
  Tc(MIN.) =    7.94
  SUBAREA AREA(ACRES) =     4.91       SUBAREA RUNOFF(CFS) =    8.40
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =       8.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =  10.51
  LONGEST FLOWPATH FROM NODE   2418.50 TO NODE   2418.30 =     510.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.30 TO NODE   2418.32 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   903.00  DOWNSTREAM(FEET) =   900.00
  FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.02
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.83
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =    8.88
  LONGEST FLOWPATH FROM NODE   2418.50 TO NODE   2418.32 =     850.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2418.32 TO NODE   2418.32 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.88
  RAINFALL INTENSITY(INCH/HR) =   6.37
  TOTAL STREAM AREA(ACRES) =     5.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.83

****************************************************************************
  FLOW PROCESS FROM NODE   2418.10 TO NODE   2417.90 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    925.00
  DOWNSTREAM ELEVATION(FEET) =    918.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.072
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE   2417.90 TO NODE   2417.91 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  918.00  DOWNSTREAM ELEVATION(FEET) =  912.00
  STREET LENGTH(FEET) =   115.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
```

```
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.75
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    3.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
  STREET FLOW TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =    4.59
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.567
  SUBAREA AREA(ACRES) =    0.51      SUBAREA RUNOFF(CFS) =    2.68
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       3.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   5.25
  FLOW VELOCITY(FEET/SEC.) =  3.92   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
  LONGEST FLOWPATH FROM NODE   2418.10 TO NODE   2417.91 =     190.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2417.91 TO NODE   2417.80 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    912.00  DOWNSTREAM(FEET) =    908.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.0075
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.832
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.62
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =    7.96
  SUBAREA AREA(ACRES) =     2.18       SUBAREA RUNOFF(CFS) =    8.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.569
  TOTAL AREA(ACRES) =        2.8         PEAK FLOW RATE(CFS) =      10.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   2.94
  LONGEST FLOWPATH FROM NODE   2418.10 TO NODE   2417.80 =     720.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2417.80 TO NODE   2417.32 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   902.00  DOWNSTREAM(FEET) =   900.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.50
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.78
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.03
  LONGEST FLOWPATH FROM NODE   2418.10 TO NODE   2417.32 =     770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2417.32 TO NODE   2417.32 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.03
  RAINFALL INTENSITY(INCH/HR) =   6.79
  TOTAL STREAM AREA(ACRES) =     2.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.78

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.83     8.88        6.368          5.16
      2       10.78     8.03        6.792          2.77

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       18.77     8.03       6.792
      2       18.93     8.88       6.368

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.93   Tc(MIN.) =    8.88
  TOTAL AREA(ACRES) =        7.9
```

```
 LONGEST FLOWPATH FROM NODE   2418.50 TO NODE   2417.32 =     850.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2418.32 TO NODE   2417.70 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   900.00  DOWNSTREAM(FEET) =   899.00
 FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.24
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      18.93
 PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    9.14
 LONGEST FLOWPATH FROM NODE   2418.50 TO NODE   2417.70 =     965.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2417.70 TO NODE   2417.70 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2417.60 TO NODE   2417.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1185.00
 DOWNSTREAM ELEVATION(FEET) =   1145.00
 ELEVATION DIFFERENCE(FEET) =     40.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
 SUBAREA RUNOFF(CFS) =      0.78
 TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
 FLOW PROCESS FROM NODE   2417.50 TO NODE   2417.40 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =    908.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   580.00   CHANNEL SLOPE =  0.4086
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.929
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.76
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.10
  Tc(MIN.) =    7.79
  SUBAREA AREA(ACRES) =     3.81       SUBAREA RUNOFF(CFS) =    7.92
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.2         PEAK FLOW RATE(CFS) =       8.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =  10.75
  LONGEST FLOWPATH FROM NODE   2417.60 TO NODE   2417.40 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2417.40 TO NODE   2417.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   902.00  DOWNSTREAM(FEET) =   899.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.42
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.63
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    7.98
  LONGEST FLOWPATH FROM NODE   2417.60 TO NODE   2417.30 =     790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2417.30 TO NODE   2417.30 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.98
  RAINFALL INTENSITY(INCH/HR) =   6.82
  TOTAL STREAM AREA(ACRES) =     4.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.63

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2417.20 TO NODE   2417.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1190.00
 DOWNSTREAM ELEVATION(FEET) =   1136.00
 ELEVATION DIFFERENCE(FEET) =     54.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
 SUBAREA RUNOFF(CFS) =      0.48
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
 FLOW PROCESS FROM NODE   2417.10 TO NODE   2417.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1136.00  DOWNSTREAM(FEET) =    910.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1085.00   CHANNEL SLOPE =  0.2083
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.320
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.87
 AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.30
 Tc(MIN.) =    8.98
 SUBAREA AREA(ACRES) =     6.18       SUBAREA RUNOFF(CFS) =   11.72
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
 TOTAL AREA(ACRES) =        6.4         PEAK FLOW RATE(CFS) =      12.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   9.67
 LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2417.30 =    1185.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2417.30 TO NODE   2417.30 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.98
  RAINFALL INTENSITY(INCH/HR) =   6.32
  TOTAL STREAM AREA(ACRES) =     6.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.63     7.98        6.820          4.15
      2       12.12     8.98        6.320          6.39

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.40     7.98       6.820
      2       20.11     8.98       6.320

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.11   Tc(MIN.) =    8.98
  TOTAL AREA(ACRES) =       10.5
  LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2417.30 =    1185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2417.30 TO NODE   2417.70 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   904.00  DOWNSTREAM(FEET) =   899.00
  FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.30
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.11
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.07
  LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2417.70 =    1270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2417.70 TO NODE   2417.70 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.07
  RAINFALL INTENSITY(INCH/HR) =   6.28
  TOTAL STREAM AREA(ACRES) =    10.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.11

****************************************************************************
  FLOW PROCESS FROM NODE   2417.70 TO NODE   2417.70 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  17.34   RAIN INTENSITY(INCH/HOUR) =  4.13
  TOTAL AREA(ACRES) =   193.00   TOTAL RUNOFF(CFS) =    310.57

****************************************************************************
  FLOW PROCESS FROM NODE   2417.70 TO NODE   2417.70 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.34
  RAINFALL INTENSITY(INCH/HR) =   4.13
  TOTAL STREAM AREA(ACRES) =   193.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    310.57

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.11     9.07        6.279         10.54
      2      310.57    17.34        4.135        193.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      182.63     9.07       6.279
      2      323.81    17.34       4.135

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     323.81   Tc(MIN.) =   17.34
  TOTAL AREA(ACRES) =      203.5
  LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2417.70 =    1270.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2417.70 TO NODE   2417.70 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      323.81    17.34       4.135      203.54
  LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2417.70 =    1270.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       18.93     9.14       6.249        7.93
  LONGEST FLOWPATH FROM NODE   2418.50 TO NODE   2417.70 =     965.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     189.65       9.14        6.249
      2     336.34      17.34        4.135

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     336.34   Tc(MIN.) =   17.34
  TOTAL AREA(ACRES) =      211.5

****************************************************************************
  FLOW PROCESS FROM NODE   2417.70 TO NODE   2417.70 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2417.70 TO NODE   2418.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   899.00  DOWNSTREAM(FEET) =   891.00
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  49.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.45
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     336.34
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =   17.81
```

```
 LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2418.60 =    1785.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2418.60 TO NODE   2418.60 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      336.34    17.81       4.065      211.47
 LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2418.60 =    1785.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       18.56    15.94       4.366        7.71
 LONGEST FLOWPATH FROM NODE   2417.84 TO NODE   2418.60 =    1645.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     319.59      15.94        4.366
     2     353.62      17.81        4.065

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     353.62   Tc(MIN.) =   17.81
 TOTAL AREA(ACRES) =      219.2

****************************************************************************
 FLOW PROCESS FROM NODE   2418.60 TO NODE   2418.60 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2418.60 TO NODE   2418.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   891.00  DOWNSTREAM(FEET) =   869.00
 FLOW LENGTH(FEET) =   745.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  57.0 INCH PIPE IS  44.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.79
 ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     353.62
```

```
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =   18.33
  LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2418.00 =    2530.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2418.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      353.62    18.33       3.990      219.18
  LONGEST FLOWPATH FROM NODE   2417.20 TO NODE   2418.00 =    2530.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      145.52    19.37       3.850      168.39
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2418.00 =    7542.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     491.30      18.33        3.990
      2     486.74      19.37        3.850

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     491.30   Tc(MIN.) =   18.33
  TOTAL AREA(ACRES) =      387.6

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2418.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2418.00 TO NODE   2380.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   869.00  DOWNSTREAM(FEET) =   858.00
  FLOW LENGTH(FEET) =   325.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  49.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.21
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =     491.30
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   18.53
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2380.20 =    7867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2380.20 TO NODE   2380.20 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2415.90 TO NODE   2415.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    915.00
  DOWNSTREAM ELEVATION(FEET) =    907.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.166
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   2415.80 TO NODE   2415.70 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  907.00  DOWNSTREAM ELEVATION(FEET) =  902.00
  STREET LENGTH(FEET) =   395.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.84
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.84
  STREET FLOW TRAVEL TIME(MIN.) =   2.59   Tc(MIN.) =    6.76
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.591
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    2.43      SUBAREA RUNOFF(CFS) =   10.51
  TOTAL AREA(ACRES) =        2.5        PEAK FLOW RATE(CFS) =      10.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.16
  FLOW VELOCITY(FEET/SEC.) =  2.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.15
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2415.70 =     480.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.70 TO NODE   2415.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.00  DOWNSTREAM(FEET) =   895.00
  FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.85
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.95
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =    7.60
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2415.60 =     725.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.60 TO NODE   2415.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.60
  RAINFALL INTENSITY(INCH/HR) =   7.04
  TOTAL STREAM AREA(ACRES) =     2.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.95

****************************************************************************
  FLOW PROCESS FROM NODE   2415.50 TO NODE   2415.40 IS CODE =  21
```

```
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.75
  UPSTREAM ELEVATION(FEET) =    905.00
  DOWNSTREAM ELEVATION(FEET) =    904.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.981
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.435
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE   2415.40 TO NODE   2415.30 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) =  904.00  DOWNSTREAM ELEVATION(FEET) =  898.00
  STREET LENGTH(FEET) =   420.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    7.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.38
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.68
  STREET FLOW TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =    9.92
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.926
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.93      SUBAREA RUNOFF(CFS) =    6.52
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       6.76
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.53
  FLOW VELOCITY(FEET/SEC.) =  2.75   DEPTH*VELOCITY(FT*FT/SEC.) =   0.93
  LONGEST FLOWPATH FROM NODE   2415.50 TO NODE   2415.30 =     488.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.30 TO NODE   2415.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   892.00  DOWNSTREAM(FEET) =   891.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.57
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.76
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   10.00
  LONGEST FLOWPATH FROM NODE   2415.50 TO NODE   2415.60 =     528.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.60 TO NODE   2415.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.00
  RAINFALL INTENSITY(INCH/HR) =   5.90
  TOTAL STREAM AREA(ACRES) =     2.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.76

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.95     7.60        7.038          2.53
      2        6.76    10.00        5.896          2.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.08     7.60       7.038
```

```
     2       15.93    10.00       5.896

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.08   Tc(MIN.) =    7.60
  TOTAL AREA(ACRES) =        4.5
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2415.60 =     725.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.60 TO NODE   2415.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   891.00  DOWNSTREAM(FEET) =   874.00
  FLOW LENGTH(FEET) =   600.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.81
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.08
  PIPE TRAVEL TIME(MIN.) =   0.93    Tc(MIN.) =    8.53
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2415.20 =    1325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.20 TO NODE   2415.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.53
  RAINFALL INTENSITY(INCH/HR) =   6.54
  TOTAL STREAM AREA(ACRES) =     4.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.08

****************************************************************************
  FLOW PROCESS FROM NODE   2415.10 TO NODE   2414.90 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.58
  UPSTREAM ELEVATION(FEET) =    902.00
  DOWNSTREAM ELEVATION(FEET) =    900.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.391
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.872
```

```
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE   2414.90 TO NODE   2415.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  900.00  DOWNSTREAM ELEVATION(FEET) =  880.00
  STREET LENGTH(FEET) =   725.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
  STREET FLOW TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =    9.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.944
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    3.27      SUBAREA RUNOFF(CFS) =   11.08
  TOTAL AREA(ACRES) =        3.4        PEAK FLOW RATE(CFS) =      11.49

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.47
  FLOW VELOCITY(FEET/SEC.) =  4.01   DEPTH*VELOCITY(FT*FT/SEC.) =   1.42
  LONGEST FLOWPATH FROM NODE   2415.10 TO NODE   2415.20 =     806.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.20 TO NODE   2415.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.88
  RAINFALL INTENSITY(INCH/HR) =   5.94
  TOTAL STREAM AREA(ACRES) =     3.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.49

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.08     8.53        6.535          4.53
      2       11.49     9.88        5.944          3.39

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.00     8.53       6.535
      2       26.11     9.88       5.944

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.11   Tc(MIN.) =    9.88
  TOTAL AREA(ACRES) =        7.9
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2415.20 =    1325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2415.20 TO NODE   2414.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   874.00  DOWNSTREAM(FEET) =   849.00
  FLOW LENGTH(FEET) =    55.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  35.64
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.11
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    9.90
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2414.80 =    1380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2414.80 TO NODE   2414.70 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    855.00  DOWNSTREAM(FEET) =    854.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.0074
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.734
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   0.54
  Tc(MIN.) =   10.44
  SUBAREA AREA(ACRES) =     8.65       SUBAREA RUNOFF(CFS) =   28.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =       16.6         PEAK FLOW RATE(CFS) =      54.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   4.49
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2414.70 =    1515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2414.70 TO NODE   2414.70 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.44   RAIN INTENSITY(INCH/HOUR) =  5.74
  TOTAL AREA(ACRES) =    16.60   TOTAL RUNOFF(CFS) =      3.70

****************************************************************************
  FLOW PROCESS FROM NODE   2414.70 TO NODE   2380.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   848.00  DOWNSTREAM(FEET) =   847.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.70
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   10.78
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2380.20 =    1620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2380.20 TO NODE   2380.20 IS CODE =  11
```

```
------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.70     10.78        5.618       16.60
  LONGEST FLOWPATH FROM NODE   2415.90 TO NODE   2380.20 =    1620.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1      491.30     18.53        3.962      387.57
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2380.20 =    7867.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     289.62      10.78        5.618
      2     493.91      18.53        3.962

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     493.91   Tc(MIN.) =   18.53
  TOTAL AREA(ACRES) =      404.2

************************************************************************
  FLOW PROCESS FROM NODE   2380.20 TO NODE   2380.20 IS CODE =  12
------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
========================================================================

************************************************************************
  FLOW PROCESS FROM NODE   2380.20 TO NODE   2380.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   847.00  DOWNSTREAM(FEET) =   831.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  58.03
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     493.91
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   18.54
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2380.00 =    7932.00 FEET.

************************************************************************
```

```
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2413.00 TO NODE   2412.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    891.00
  DOWNSTREAM ELEVATION(FEET) =    888.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
  FLOW PROCESS FROM NODE   2412.00 TO NODE   2412.50 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  888.00  DOWNSTREAM ELEVATION(FEET) =  882.00
  STREET LENGTH(FEET) =   358.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.06
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
  STREET FLOW TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =    8.29
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.656
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .5700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =    6.98
TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       7.36

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.03
FLOW VELOCITY(FEET/SEC.) =  3.53   DEPTH*VELOCITY(FT*FT/SEC.) =   1.43
LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2412.50 =     453.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2412.50 TO NODE   2411.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   876.00  DOWNSTREAM(FEET) =   874.00
FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   4.79
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       7.36
PIPE TRAVEL TIME(MIN.) =   1.25    Tc(MIN.) =    9.54
LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2411.00 =     813.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2411.00 TO NODE   2411.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =    9.54
RAINFALL INTENSITY(INCH/HR) =   6.08
TOTAL STREAM AREA(ACRES) =     1.94
PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.36

****************************************************************************
FLOW PROCESS FROM NODE   2410.00 TO NODE   2409.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .5700
S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.75
  UPSTREAM ELEVATION(FEET) =    895.00
  DOWNSTREAM ELEVATION(FEET) =    894.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.981
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.435
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE   2409.00 TO NODE   2411.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  894.00  DOWNSTREAM ELEVATION(FEET) =  880.00
  STREET LENGTH(FEET) =   495.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.24
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.13
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =    9.25
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.202
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    3.81      SUBAREA RUNOFF(CFS) =   13.47
  TOTAL AREA(ACRES) =        3.9        PEAK FLOW RATE(CFS) =      13.72

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.28
  FLOW VELOCITY(FEET/SEC.) =  4.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.57
  LONGEST FLOWPATH FROM NODE   2410.00 TO NODE   2411.00 =     563.75 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2411.00 TO NODE   2411.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.25
  RAINFALL INTENSITY(INCH/HR) =   6.20
  TOTAL STREAM AREA(ACRES) =     3.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.36     9.54        6.078          1.94
      2       13.72     9.25        6.202          3.88

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       20.85     9.25       6.202
      2       20.80     9.54       6.078

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.85   Tc(MIN.) =    9.25
  TOTAL AREA(ACRES) =        5.8
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2411.00 =     813.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2411.00 TO NODE   2408.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   874.00  DOWNSTREAM(FEET) =   873.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.38
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.85
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    9.36
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2408.00 =     878.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2408.00 TO NODE   2408.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.36
  RAINFALL INTENSITY(INCH/HR) =   6.15
  TOTAL STREAM AREA(ACRES) =     5.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.85

****************************************************************************
  FLOW PROCESS FROM NODE   2407.00 TO NODE   2406.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    885.00
  DOWNSTREAM ELEVATION(FEET) =    883.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.613
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.700
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE   2406.00 TO NODE   2405.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  883.00  DOWNSTREAM ELEVATION(FEET) =  880.00
  STREET LENGTH(FEET) =   285.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.38
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =    8.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.364
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    5.84
  TOTAL AREA(ACRES) =        1.7        PEAK FLOW RATE(CFS) =       6.20

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.84
  FLOW VELOCITY(FEET/SEC.) =  2.40   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
  LONGEST FLOWPATH FROM NODE   2407.00 TO NODE   2405.00 =     370.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2405.00 TO NODE   2408.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   874.00  DOWNSTREAM(FEET) =   873.00
  FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.78
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.20
  PIPE TRAVEL TIME(MIN.) =   1.46    Tc(MIN.) =   10.34
  LONGEST FLOWPATH FROM NODE   2407.00 TO NODE   2408.00 =     700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2408.00 TO NODE   2408.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.34
  RAINFALL INTENSITY(INCH/HR) =   5.77
  TOTAL STREAM AREA(ACRES) =     1.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.20
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.85     9.36        6.152          5.82
      2        6.20    10.34        5.771          1.71

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.47     9.36       6.152
      2       25.76    10.34       5.771

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.47   Tc(MIN.) =    9.36
  TOTAL AREA(ACRES) =        7.5
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2408.00 =     878.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2408.00 TO NODE   2404.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   873.00  DOWNSTREAM(FEET) =   867.00
  FLOW LENGTH(FEET) =   395.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.94
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.47
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   10.03
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2404.00 =    1273.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2404.00 TO NODE   2404.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.03
  RAINFALL INTENSITY(INCH/HR) =   5.89
  TOTAL STREAM AREA(ACRES) =     7.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.47

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2403.00 TO NODE   2402.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    66.67
 UPSTREAM ELEVATION(FEET) =    885.00
 DOWNSTREAM ELEVATION(FEET) =    884.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.805
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.559
 SUBAREA RUNOFF(CFS) =      0.56
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2404.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  884.00  DOWNSTREAM ELEVATION(FEET) =  873.00
 STREET LENGTH(FEET) =   425.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.03
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.27
   HALFSTREET FLOOD WIDTH(FEET) =    7.31
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.84
 STREET FLOW TRAVEL TIME(MIN.) =   2.29   Tc(MIN.) =    9.10
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.268
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
 SUBAREA AREA(ACRES) =    1.93      SUBAREA RUNOFF(CFS) =    6.89
```

```
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       7.36

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.63
  FLOW VELOCITY(FEET/SEC.) =  3.52   DEPTH*VELOCITY(FT*FT/SEC.) =   1.12
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2404.00 =     491.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2404.00 TO NODE   2404.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.10
  RAINFALL INTENSITY(INCH/HR) =   6.27
  TOTAL STREAM AREA(ACRES) =     2.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.36

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.47    10.03        5.887          7.53
      2        7.36     9.10        6.268          2.06

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       32.22     9.10       6.268
      2       33.38    10.03       5.887

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.38   Tc(MIN.) =   10.03
  TOTAL AREA(ACRES) =        9.6
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2404.00 =    1273.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2404.00 TO NODE   2401.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   867.00  DOWNSTREAM(FEET) =   830.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.31
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.38
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   10.12
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2401.00 =    1433.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2401.00 TO NODE   2380.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    830.00  DOWNSTREAM(FEET) =    829.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    95.00   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.728
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   1.37   TRAVEL TIME(MIN.) =   0.34
  Tc(MIN.) =   10.46
  SUBAREA AREA(ACRES) =     1.66       SUBAREA RUNOFF(CFS) =    5.42
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =       11.2         PEAK FLOW RATE(CFS) =      36.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2380.00 =    1528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2390.00 TO NODE   2389.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
```

```
  UPSTREAM ELEVATION(FEET) =    900.00
  DOWNSTREAM ELEVATION(FEET) =    895.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.579
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.592
  SUBAREA RUNOFF(CFS) =      0.98
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.98

****************************************************************************
  FLOW PROCESS FROM NODE   2389.00 TO NODE   2389.50 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  895.00  DOWNSTREAM ELEVATION(FEET) =  876.00
  STREET LENGTH(FEET) =   565.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.17
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.75
  STREET FLOW TRAVEL TIME(MIN.) =   2.97   Tc(MIN.) =    8.55
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.526
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.91      SUBAREA RUNOFF(CFS) =    3.38
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       4.13

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.91
  FLOW VELOCITY(FEET/SEC.) =  3.46   DEPTH*VELOCITY(FT*FT/SEC.) =   0.92
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2389.50 =     665.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2389.50 TO NODE   2388.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   870.00  DOWNSTREAM(FEET) =   867.00
 FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.89
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.13
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    8.69
 LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2388.00 =     740.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2388.00 TO NODE   2388.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.69
 RAINFALL INTENSITY(INCH/HR) =   6.46
 TOTAL STREAM AREA(ACRES) =     1.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.13

****************************************************************************
 FLOW PROCESS FROM NODE   2387.00 TO NODE   2386.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =    881.00
 DOWNSTREAM ELEVATION(FEET) =    878.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE   2386.00 TO NODE   2385.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  878.00  DOWNSTREAM ELEVATION(FEET) =  874.00
  STREET LENGTH(FEET) =   170.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.44
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.65
  STREET FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    7.39
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.168
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.95      SUBAREA RUNOFF(CFS) =    3.88
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       4.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.71
  FLOW VELOCITY(FEET/SEC.) =  3.04   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE   2387.00 TO NODE   2385.00 =     265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2385.00 TO NODE   2388.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   868.00  DOWNSTREAM(FEET) =   867.00
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.99
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.33
```

```
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    7.46
  LONGEST FLOWPATH FROM NODE   2387.00 TO NODE   2388.00 =     300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2388.00 TO NODE   2388.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.46
  RAINFALL INTENSITY(INCH/HR) =   7.12
  TOTAL STREAM AREA(ACRES) =     1.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.13     8.69        6.457          1.11
      2        4.33     7.46        7.122          1.06

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.88     7.46       7.122
      2        8.06     8.69       6.457

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.06   Tc(MIN.) =    8.69
  TOTAL AREA(ACRES) =        2.2
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2388.00 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2388.00 TO NODE   2384.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   867.00  DOWNSTREAM(FEET) =   859.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.68
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       8.06
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    9.00
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2384.00 =     940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2384.00 TO NODE   2384.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.00
  RAINFALL INTENSITY(INCH/HR) =   6.31
  TOTAL STREAM AREA(ACRES) =     2.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.06

****************************************************************************
  FLOW PROCESS FROM NODE   2383.00 TO NODE   2382.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.50
  UPSTREAM ELEVATION(FEET) =    876.00
  DOWNSTREAM ELEVATION(FEET) =    872.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.885
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.302
  SUBAREA RUNOFF(CFS) =      0.95
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.95

****************************************************************************
  FLOW PROCESS FROM NODE   2382.00 TO NODE   2384.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  872.00  DOWNSTREAM ELEVATION(FEET) =  865.00
  STREET LENGTH(FEET) =   150.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```

```
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.18
    HALFSTREET FLOOD WIDTH(FEET) =    2.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.64
  STREET FLOW TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =    6.61
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.705
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.88
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       1.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   3.72
  FLOW VELOCITY(FEET/SEC.) =  3.42   DEPTH*VELOCITY(FT*FT/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE   2383.00 TO NODE   2384.00 =     247.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2384.00 TO NODE   2384.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.61
  RAINFALL INTENSITY(INCH/HR) =   7.70
  TOTAL STREAM AREA(ACRES) =     0.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.76

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.06     9.00        6.312          2.17
      2        1.76     6.61        7.705          0.40

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        8.36     6.61       7.705
      2        9.49     9.00       6.312

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.49   Tc(MIN.) =    9.00
  TOTAL AREA(ACRES) =        2.6
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2384.00 =     940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2384.00 TO NODE   2381.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   859.00  DOWNSTREAM(FEET) =   832.00
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.17
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.49
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.06
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2381.00 =    1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2381.00 TO NODE   2380.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.00  DOWNSTREAM(FEET) =    830.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    80.00   CHANNEL SLOPE =  0.0250
  CHANNEL FLOW THRU SUBAREA(CFS) =       9.49
  FLOW VELOCITY(FEET/SEC) =   3.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.34   Tc(MIN.) =    9.41
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2380.00 =    1110.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        9.49     9.41       6.135        2.57
```

```
  LONGEST FLOWPATH FROM NODE   2390.00 TO NODE   2380.00 =    1110.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       36.73    10.46       5.728       11.25
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2380.00 =    1528.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      42.52       9.41        6.135
      2      45.59      10.46        5.728

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      45.59   Tc(MIN.) =   10.46
  TOTAL AREA(ACRES) =       13.8

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.46   RAIN INTENSITY(INCH/HOUR) =  5.73
  TOTAL AREA(ACRES) =    13.80   TOTAL RUNOFF(CFS) =      7.40

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.40    10.46       5.729       13.80
  LONGEST FLOWPATH FROM NODE   2413.00 TO NODE   2380.00 =    1528.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
```

```
      1      493.91    18.54       3.959      404.17
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2380.00 =    7932.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     285.98      10.46        5.729
      2     499.03      18.54        3.959

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     499.03   Tc(MIN.) =   18.54
  TOTAL AREA(ACRES) =      418.0

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2380.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2380.00 TO NODE   2379.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    837.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   170.00   CHANNEL SLOPE =  0.0706
  CHANNEL FLOW THRU SUBAREA(CFS) =     499.03
  FLOW VELOCITY(FEET/SEC) =  20.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.14   Tc(MIN.) =   18.68
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2379.00 =    8102.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2379.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2378.00 TO NODE   2377.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1175.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1155.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.548
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.749
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
  FLOW PROCESS FROM NODE   2377.00 TO NODE   2376.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1155.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2833
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.126
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.50
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   0.91
  Tc(MIN.) =    7.46
  SUBAREA AREA(ACRES) =     1.84       SUBAREA RUNOFF(CFS) =    3.28
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        1.9         PEAK FLOW RATE(CFS) =       3.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   7.00
  LONGEST FLOWPATH FROM NODE   2378.00 TO NODE   2376.00 =     385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2376.00 TO NODE   2375.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =    955.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   605.00   CHANNEL SLOPE =  0.1901
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.529
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.30
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   1.08
  Tc(MIN.) =    8.54
  SUBAREA AREA(ACRES) =    10.41       SUBAREA RUNOFF(CFS) =   16.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =       12.4         PEAK FLOW RATE(CFS) =      20.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =  10.94
  LONGEST FLOWPATH FROM NODE   2378.00 TO NODE   2375.00 =     990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2375.00 TO NODE   2374.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.1538
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.230
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.80
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   0.64
  Tc(MIN.) =    9.18
  SUBAREA AREA(ACRES) =    16.11       SUBAREA RUNOFF(CFS) =   26.10
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.256
  TOTAL AREA(ACRES) =       28.5         PEAK FLOW RATE(CFS) =      45.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =  12.89
  LONGEST FLOWPATH FROM NODE   2378.00 TO NODE   2374.00 =    1445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2374.00 TO NODE   2379.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    885.00  DOWNSTREAM(FEET) =    855.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   420.00   CHANNEL SLOPE =  0.0714
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.944
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.08
 AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   0.69
 Tc(MIN.) =    9.88
 SUBAREA AREA(ACRES) =     4.23       SUBAREA RUNOFF(CFS) =    7.54
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.261
 TOTAL AREA(ACRES) =       32.7         PEAK FLOW RATE(CFS) =      50.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =  10.13
 LONGEST FLOWPATH FROM NODE   2378.00 TO NODE   2379.20 =    1865.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2379.20 TO NODE   2379.20 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2373.00 TO NODE   2372.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
 UPSTREAM ELEVATION(FEET) =    925.00
 DOWNSTREAM ELEVATION(FEET) =    924.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.663
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.663
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
 FLOW PROCESS FROM NODE   2372.00 TO NODE   2371.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  924.00  DOWNSTREAM ELEVATION(FEET) =  914.00
 STREET LENGTH(FEET) =   290.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.25
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
  STREET FLOW TRAVEL TIME(MIN.) =   1.49   Tc(MIN.) =    8.15
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.729
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.30      SUBAREA RUNOFF(CFS) =    4.99
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       5.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.78
  FLOW VELOCITY(FEET/SEC.) =  3.69   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2371.00 =     355.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2371.00 TO NODE   2370.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   908.00  DOWNSTREAM(FEET) =   906.00
  FLOW LENGTH(FEET) =   310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.85
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.33
  PIPE TRAVEL TIME(MIN.) =   1.07    Tc(MIN.) =    9.21
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2370.00 =     665.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2370.00 TO NODE   2370.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.21
  RAINFALL INTENSITY(INCH/HR) =   6.22
  TOTAL STREAM AREA(ACRES) =     1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.33

****************************************************************************
  FLOW PROCESS FROM NODE   2369.00 TO NODE   2368.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    920.00
  DOWNSTREAM ELEVATION(FEET) =    917.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   2368.00 TO NODE   2370.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  917.00  DOWNSTREAM ELEVATION(FEET) =  912.00
  STREET LENGTH(FEET) =   360.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.20
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
```

```
   HALFSTREET FLOOD WIDTH(FEET) =    8.57
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.46
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
  STREET FLOW TRAVEL TIME(MIN.) =   2.44   Tc(MIN.) =    8.78
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.415
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    2.01      SUBAREA RUNOFF(CFS) =    7.35
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       7.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.22
  FLOW VELOCITY(FEET/SEC.) =  2.82   DEPTH*VELOCITY(FT*FT/SEC.) =   0.99
  LONGEST FLOWPATH FROM NODE   2369.00 TO NODE   2370.00 =     455.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2370.00 TO NODE   2370.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.78
  RAINFALL INTENSITY(INCH/HR) =   6.41
  TOTAL STREAM AREA(ACRES) =     2.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.33     9.21        6.216          1.39
      2        7.75     8.78        6.415          2.12

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.83     8.78       6.415
      2       12.84     9.21       6.216

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.84   Tc(MIN.) =    9.21
  TOTAL AREA(ACRES) =        3.5
```

```
 LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2370.00 =     665.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2370.00 TO NODE   2367.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   906.00  DOWNSTREAM(FEET) =   894.00
 FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.98
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.84
 PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    9.63
 LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2367.00 =     965.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2367.00 TO NODE   2367.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.63
 RAINFALL INTENSITY(INCH/HR) =   6.04
 TOTAL STREAM AREA(ACRES) =     3.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.84

****************************************************************************
 FLOW PROCESS FROM NODE   2366.00 TO NODE   2365.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.58
 UPSTREAM ELEVATION(FEET) =    911.00
 DOWNSTREAM ELEVATION(FEET) =    909.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.391
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.872
 SUBAREA RUNOFF(CFS) =      0.27
 TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
 FLOW PROCESS FROM NODE   2365.00 TO NODE   2367.00 IS CODE =  62
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) =  909.00  DOWNSTREAM ELEVATION(FEET) =  900.00
  STREET LENGTH(FEET) =   405.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.90
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.08
  STREET FLOW TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =    8.41
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.594
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.80      SUBAREA RUNOFF(CFS) =    6.77
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       6.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  12.97
  FLOW VELOCITY(FEET/SEC.) =  3.88   DEPTH*VELOCITY(FT*FT/SEC.) =   1.50
  LONGEST FLOWPATH FROM NODE   2366.00 TO NODE   2367.00 =     486.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2367.00 TO NODE   2367.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.41
  RAINFALL INTENSITY(INCH/HR) =   6.59
  TOTAL STREAM AREA(ACRES) =     1.86
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.99

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       12.84     9.63        6.041          3.51
      2        6.99     8.41        6.594          1.86

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       18.76     8.41       6.594
      2       19.25     9.63       6.041

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.25   Tc(MIN.) =    9.63
  TOTAL AREA(ACRES) =        5.4
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2367.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2367.00 TO NODE   2364.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   894.00  DOWNSTREAM(FEET) =   887.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.47
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.25
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    9.91
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2364.00 =    1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2364.00 TO NODE   2364.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.91
  RAINFALL INTENSITY(INCH/HR) =   5.93
  TOTAL STREAM AREA(ACRES) =     5.37
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.25
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2363.00 TO NODE   2362.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.33
  UPSTREAM ELEVATION(FEET) =    905.00
  DOWNSTREAM ELEVATION(FEET) =    903.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.505
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.782
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE   2362.00 TO NODE   2364.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  903.00  DOWNSTREAM ELEVATION(FEET) =  894.00
  STREET LENGTH(FEET) =   230.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.51
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
  STREET FLOW TRAVEL TIME(MIN.) =   1.00   Tc(MIN.) =    7.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.098
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.02      SUBAREA RUNOFF(CFS) =    4.13
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       4.53

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.63
  FLOW VELOCITY(FEET/SEC.) =  4.33   DEPTH*VELOCITY(FT*FT/SEC.) =   1.38
  LONGEST FLOWPATH FROM NODE   2363.00 TO NODE   2364.00 =     313.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2364.00 TO NODE   2364.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.50
  RAINFALL INTENSITY(INCH/HR) =   7.10
  TOTAL STREAM AREA(ACRES) =     1.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.53

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       19.25     9.91        5.933          5.37
      2        4.53     7.50        7.098          1.12

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       20.62     7.50       7.098
      2       23.04     9.91       5.933

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.04   Tc(MIN.) =    9.91
  TOTAL AREA(ACRES) =        6.5
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2364.00 =    1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2364.00 TO NODE   2361.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   888.00  DOWNSTREAM(FEET) =   884.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.78
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.04
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   10.03
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2361.00 =    1270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2361.00 TO NODE   2361.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.03
  RAINFALL INTENSITY(INCH/HR) =   5.89
  TOTAL STREAM AREA(ACRES) =     6.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.04

****************************************************************************
  FLOW PROCESS FROM NODE   2360.00 TO NODE   2359.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    898.00
  DOWNSTREAM ELEVATION(FEET) =    895.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.338
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.914
  SUBAREA RUNOFF(CFS) =      0.63
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.63

****************************************************************************
  FLOW PROCESS FROM NODE   2359.00 TO NODE   2361.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  895.00  DOWNSTREAM ELEVATION(FEET) =  890.00
  STREET LENGTH(FEET) =   195.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.44
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.29
   HALFSTREET FLOOD WIDTH(FEET) =    7.97
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.23
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
 STREET FLOW TRAVEL TIME(MIN.) =   1.00   Tc(MIN.) =    7.34
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.197
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
 SUBAREA AREA(ACRES) =    0.88      SUBAREA RUNOFF(CFS) =    3.61
 TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       4.18

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.16
 FLOW VELOCITY(FEET/SEC.) =  3.64   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
 LONGEST FLOWPATH FROM NODE   2360.00 TO NODE   2361.00 =     290.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2361.00 TO NODE   2361.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.34
 RAINFALL INTENSITY(INCH/HR) =   7.20
 TOTAL STREAM AREA(ACRES) =     1.02
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.18

 ** CONFLUENCE DATA **
 STREAM     RUNOFF        Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       23.04    10.03        5.887          6.49
     2        4.18     7.34        7.197          1.02
```

```
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       23.03     7.34       7.197
     2       26.46    10.03       5.887

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      26.46   Tc(MIN.) =   10.03
 TOTAL AREA(ACRES) =        7.5
 LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2361.00 =    1270.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2361.00 TO NODE   2358.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   884.00  DOWNSTREAM(FEET) =   879.00
 FLOW LENGTH(FEET) =   145.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.20
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      26.46
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   10.21
 LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2358.00 =    1415.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2358.00 TO NODE   2358.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.21
 RAINFALL INTENSITY(INCH/HR) =   5.82
 TOTAL STREAM AREA(ACRES) =     7.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.46

****************************************************************************
 FLOW PROCESS FROM NODE   2357.00 TO NODE   2356.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    895.00
  DOWNSTREAM ELEVATION(FEET) =    892.40
  ELEVATION DIFFERENCE(FEET) =      2.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.059
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.147
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE   2356.00 TO NODE   2358.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  892.40  DOWNSTREAM ELEVATION(FEET) =  885.00
  STREET LENGTH(FEET) =   370.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
  STREET FLOW TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =    8.28
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.660
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.77      SUBAREA RUNOFF(CFS) =    6.72
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       7.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =   9.97
  FLOW VELOCITY(FEET/SEC.) =  3.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
  LONGEST FLOWPATH FROM NODE   2357.00 TO NODE   2358.00 =     455.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2358.00 TO NODE   2358.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.28
  RAINFALL INTENSITY(INCH/HR) =   6.66
  TOTAL STREAM AREA(ACRES) =     1.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.10

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.46    10.21        5.819          7.51
      2        7.10     8.28        6.660          1.87

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       30.21     8.28       6.660
      2       32.66    10.21       5.819

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      32.66   Tc(MIN.) =   10.21
  TOTAL AREA(ACRES) =        9.4
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2358.00 =    1415.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2358.00 TO NODE   2555.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   879.00  DOWNSTREAM(FEET) =   865.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.27
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.66
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   10.40
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2555.00 =    1620.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2555.00 TO NODE   2554.80 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.00  DOWNSTREAM(FEET) =    864.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0200
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.699
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.69
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   0.15
  Tc(MIN.) =   10.54
  SUBAREA AREA(ACRES) =     0.78       SUBAREA RUNOFF(CFS) =    1.33
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.549
  TOTAL AREA(ACRES) =       10.2         PEAK FLOW RATE(CFS) =      32.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2554.80 =    1670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2554.80 TO NODE   2379.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    864.00  DOWNSTREAM(FEET) =    855.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0300
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.455
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.75
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   0.74
  Tc(MIN.) =   11.28
  SUBAREA AREA(ACRES) =     4.94       SUBAREA RUNOFF(CFS) =    7.55
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.461
  TOTAL AREA(ACRES) =       15.1         PEAK FLOW RATE(CFS) =      37.99
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   6.83
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2379.20 =    1970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2379.20 TO NODE   2379.20 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       37.99    11.28       5.455       15.10
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2379.20 =    1970.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       50.79     9.88       5.944       32.69
  LONGEST FLOWPATH FROM NODE   2378.00 TO NODE   2379.20 =    1865.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      84.05       9.88        5.944
      2      84.60      11.28        5.455

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.60   Tc(MIN.) =   11.28
  TOTAL AREA(ACRES) =       47.8

****************************************************************************
  FLOW PROCESS FROM NODE   2379.20 TO NODE   2379.20 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2379.20 TO NODE   2379.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    855.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.00   CHANNEL SLOPE =  0.0492
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
```

```
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.167
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.27
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   0.99
  Tc(MIN.) =   12.27
  SUBAREA AREA(ACRES) =     5.40       SUBAREA RUNOFF(CFS) =    8.37
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.322
  TOTAL AREA(ACRES) =       53.2         PEAK FLOW RATE(CFS) =      88.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =  10.30
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2379.00 =    2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2379.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       88.51    12.27       5.167       53.19
  LONGEST FLOWPATH FROM NODE   2373.00 TO NODE   2379.00 =    2580.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      499.03    18.68       3.941      417.97
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2379.00 =    8102.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     416.38      12.27        5.167
      2     566.53      18.68        3.941

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     566.53   Tc(MIN.) =   18.68
  TOTAL AREA(ACRES) =      471.2

****************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2379.00 IS CODE =  12
----------------------------------------------------------------------------
```

```
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2379.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.68
  RAINFALL INTENSITY(INCH/HR) =   3.94
  TOTAL STREAM AREA(ACRES) =   471.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    566.53

********************************************************************************
  FLOW PROCESS FROM NODE   2370.00 TO NODE   2369.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1065.00
  DOWNSTREAM ELEVATION(FEET) =   1020.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.538
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.633
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.40

********************************************************************************
  FLOW PROCESS FROM NODE   2369.00 TO NODE   2368.00 IS CODE =  53
--------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1020.00  DOWNSTREAM(FEET) =    860.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   360.00   CHANNEL SLOPE =  0.4444
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2193 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.40
  FLOW VELOCITY(FEET/SEC) =   2.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.29   Tc(MIN.) =    7.83
  LONGEST FLOWPATH FROM NODE   2370.00 TO NODE   2368.00 =     455.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2369.00 TO NODE   2368.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.907
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =    0.93   SUBAREA RUNOFF(CFS) =    2.70
  TOTAL AREA(ACRES) =        1.0   TOTAL RUNOFF(CFS) =       3.02
  TC(MIN.) =    7.83

****************************************************************************
  FLOW PROCESS FROM NODE   2368.00 TO NODE   2367.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   865.00  DOWNSTREAM(FEET) =   830.00
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.68
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.02
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    7.94
  LONGEST FLOWPATH FROM NODE   2370.00 TO NODE   2367.00 =     570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2367.00 TO NODE   2379.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    830.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   110.00   CHANNEL SLOPE =  0.0455
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0455 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.02
  FLOW VELOCITY(FEET/SEC) =   1.72 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.06   Tc(MIN.) =    9.00
  LONGEST FLOWPATH FROM NODE   2370.00 TO NODE   2379.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2379.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.00
  RAINFALL INTENSITY(INCH/HR) =   6.31
  TOTAL STREAM AREA(ACRES) =     1.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.02

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      566.53    18.68        3.941        471.16
      2        3.02     9.00        6.310          1.04

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      276.06     9.00       6.310
      2      568.41    18.68       3.941

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     568.41   Tc(MIN.) =   18.68
  TOTAL AREA(ACRES) =      472.2
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2379.00 =    8102.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2378.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   655.00   CHANNEL SLOPE =  0.0153
  CHANNEL FLOW THRU SUBAREA(CFS) =     568.41
  FLOW VELOCITY(FEET/SEC) =  10.08 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.08   Tc(MIN.) =   19.76
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2378.00 =    8757.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2379.00 TO NODE   2378.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.800
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2985
  SUBAREA AREA(ACRES) =   13.91   SUBAREA RUNOFF(CFS) =   22.20
  TOTAL AREA(ACRES) =      486.1   TOTAL RUNOFF(CFS) =     568.41
  TC(MIN.) =   19.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE   2378.00 TO NODE   2378.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.76
  RAINFALL INTENSITY(INCH/HR) =   3.80
  TOTAL STREAM AREA(ACRES) =   486.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    568.41

****************************************************************************
  FLOW PROCESS FROM NODE   2366.00 TO NODE   2365.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1180.00
  DOWNSTREAM ELEVATION(FEET) =   1175.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.944
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.248
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
  FLOW PROCESS FROM NODE   2365.00 TO NODE   2364.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =    860.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.00   CHANNEL SLOPE =  0.4737
```

```
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2224 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.45
  FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.20   Tc(MIN.) =   10.14
  LONGEST FLOWPATH FROM NODE   2366.00 TO NODE   2364.00 =     745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2365.00 TO NODE   2364.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.844
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =    3.34   SUBAREA RUNOFF(CFS) =    8.20
  TOTAL AREA(ACRES) =        3.5   TOTAL RUNOFF(CFS) =       8.52
  TC(MIN.) =   10.14

****************************************************************************
  FLOW PROCESS FROM NODE   2364.00 TO NODE   2363.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   860.00  DOWNSTREAM(FEET) =   842.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.72
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.52
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   10.23
  LONGEST FLOWPATH FROM NODE   2366.00 TO NODE   2363.00 =     845.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2363.00 TO NODE   2378.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    842.00  DOWNSTREAM(FEET) =    815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00   CHANNEL SLOPE =  0.0600
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0600 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.52
  FLOW VELOCITY(FEET/SEC) =   2.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.68   Tc(MIN.) =   12.91
  LONGEST FLOWPATH FROM NODE   2366.00 TO NODE   2378.00 =    1295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2378.00 TO NODE   2378.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.91
  RAINFALL INTENSITY(INCH/HR) =   5.00
  TOTAL STREAM AREA(ACRES) =     3.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.52

****************************************************************************
  FLOW PROCESS FROM NODE   2362.00 TO NODE   2361.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1175.00
  DOWNSTREAM ELEVATION(FEET) =   1165.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.082
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.125
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   2361.00 TO NODE   2360.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1165.00  DOWNSTREAM(FEET) =    865.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   580.00   CHANNEL SLOPE =  0.5172
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2259 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.38
  FLOW VELOCITY(FEET/SEC) =   2.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
 TRAVEL TIME(MIN.) =   3.63   Tc(MIN.) =    8.71
 LONGEST FLOWPATH FROM NODE   2362.00 TO NODE   2360.00 =     660.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2361.00 TO NODE   2360.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.445
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
 SUBAREA AREA(ACRES) =    2.99   SUBAREA RUNOFF(CFS) =    8.09
 TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       8.36
 TC(MIN.) =    8.71

****************************************************************************
 FLOW PROCESS FROM NODE   2360.00 TO NODE   2359.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   865.00  DOWNSTREAM(FEET) =   839.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.23
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.36
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.79
 LONGEST FLOWPATH FROM NODE   2362.00 TO NODE   2359.00 =     760.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2359.00 TO NODE   2378.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    839.00  DOWNSTREAM(FEET) =    815.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   310.00   CHANNEL SLOPE =  0.0774
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0774 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =       8.36
 FLOW VELOCITY(FEET/SEC) =   3.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   10.43
 LONGEST FLOWPATH FROM NODE   2362.00 TO NODE   2378.00 =    1070.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2378.00 TO NODE   2378.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.43
  RAINFALL INTENSITY(INCH/HR) =   5.74
  TOTAL STREAM AREA(ACRES) =     3.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.36

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      568.41    19.76        3.800        486.11
      2        8.52    12.91        5.002          3.47
      3        8.36    10.43        5.740          3.09

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      391.55    10.43       5.740
      2      447.68    12.91       5.002
      3      580.42    19.76       3.800

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     580.42   Tc(MIN.) =   19.76
  TOTAL AREA(ACRES) =      492.7
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE   2378.00 =    8757.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2378.00 TO NODE     25.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.00  DOWNSTREAM(FEET) =    795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   935.00   CHANNEL SLOPE =  0.0214
  CHANNEL FLOW THRU SUBAREA(CFS) =     580.42
  FLOW VELOCITY(FEET/SEC) =  12.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.30   Tc(MIN.) =   21.06
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE     25.00 =    9692.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2378.00 TO NODE     25.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.648
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3013
  SUBAREA AREA(ACRES) =    4.80   SUBAREA RUNOFF(CFS) =    7.35
  TOTAL AREA(ACRES) =      497.5   TOTAL RUNOFF(CFS) =     580.42
  TC(MIN.) =   21.06
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.06
  RAINFALL INTENSITY(INCH/HR) =   3.65
  TOTAL STREAM AREA(ACRES) =   497.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    580.42

****************************************************************************
  FLOW PROCESS FROM NODE     25.30 TO NODE     25.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1175.00
  DOWNSTREAM ELEVATION(FEET) =   1150.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.707
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.467
  SUBAREA RUNOFF(CFS) =      0.93
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.93

****************************************************************************
  FLOW PROCESS FROM NODE     25.20 TO NODE     25.10 IS CODE =  53
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    935.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   590.00   CHANNEL SLOPE =  0.3644
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2078 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.93
  FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.85   Tc(MIN.) =    9.56
  LONGEST FLOWPATH FROM NODE     25.30 TO NODE     25.10 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.20 TO NODE     25.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.071
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3800
  SUBAREA AREA(ACRES) =    9.55   SUBAREA RUNOFF(CFS) =   22.03
  TOTAL AREA(ACRES) =        9.8   TOTAL RUNOFF(CFS) =      22.70
  TC(MIN.) =    9.56

****************************************************************************
  FLOW PROCESS FROM NODE     25.10 TO NODE     25.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    935.00  DOWNSTREAM(FEET) =    795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2310.00   CHANNEL SLOPE =  0.0606
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0606 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      22.70
  FLOW VELOCITY(FEET/SEC) =   3.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   9.87   Tc(MIN.) =   19.43
  LONGEST FLOWPATH FROM NODE     25.30 TO NODE     25.00 =    2990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.10 TO NODE     25.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.842
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3649
  SUBAREA AREA(ACRES) =   30.51   SUBAREA RUNOFF(CFS) =   42.20
  TOTAL AREA(ACRES) =       40.3   TOTAL RUNOFF(CFS) =      56.56
  TC(MIN.) =   19.43

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.43
  RAINFALL INTENSITY(INCH/HR) =   3.84
  TOTAL STREAM AREA(ACRES) =    40.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     56.56

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      580.42    21.06        3.648        497.47
      2       56.56    19.43        3.842         40.35

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      607.63    19.43       3.842
      2      634.12    21.06       3.648

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     634.12   Tc(MIN.) =   21.06
  TOTAL AREA(ACRES) =      537.8
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE     25.00 =    9692.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     24.90 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    795.00  DOWNSTREAM(FEET) =    763.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1270.00   CHANNEL SLOPE =  0.0252
  CHANNEL FLOW THRU SUBAREA(CFS) =     634.12
  FLOW VELOCITY(FEET/SEC) =  13.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.58   Tc(MIN.) =   22.64
  LONGEST FLOWPATH FROM NODE   2599.00 TO NODE     24.90 =   10962.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     24.90 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.481
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3089
  SUBAREA AREA(ACRES) =   15.21   SUBAREA RUNOFF(CFS) =   21.71
  TOTAL AREA(ACRES) =      553.0   TOTAL RUNOFF(CFS) =     634.12
  TC(MIN.) =   22.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      553.0  TC(MIN.) =     22.64
  PEAK FLOW RATE(CFS)   =     634.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-34-9.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2340	2339	2	867.7	865	75	0.9	0.11				
2339	2338	6	865	853	700	0.9	1.50	1 SIDE			
2338	2335	3	847	834	410						
2335	2335	1						1 OF 2			
2337	2336	2	854.7	851.9	85	0.9	0.11				
2336	2335	6	851.9	840	370	0.9	1.00	1 SIDE			
2335	2335	1						2 OF 2			
2335	2332	3	834	818.2	355						
2332	2332	1						1 OF 2			
2334	2333	2	841.7	837.7	85	0.9	0.10				
2333	2332	6	837.7	820	315	0.9	0.41	1 SIDE			
2332	2332	1						2 OF 2			
2332	2331	3	818.2	817	120						
2331	2330	5	817	816.7	25			VALLEY			
2330	2330	10						SAVE TO BANK 1			
2358	2357	2	1180	1165	90	0.42	0.14				
2357	2356	5	1165	1055	490			MTN			
2357	2356	8				0.42	6.15				
2356	2355	5	1055	850	935			MTN			
2356	2355	8				0.42	13.59				
2355	2346	3	824	814	185						
2346	2346	10						SAVE TO BANK 2			
2354	2353	2	1300	1275	100	0.42	0.09				
2353	2352	5	1275	1055	580			MTN			
2353	2352	8				0.42	5.10				
2352	2351	5	1055	845	950			MTN			
2352	2351	8				0.42	10.54				
2351	2348	3	839	821	390						
2348	2348	1						1 OF 2			
2350	2349.5	2	842	841	90	0.6	0.13				
2349.5	2349	5	841	835	235			VALLEY			
2349.5	2349	8				0.6	2.68				
2349	2348	3	829	821	105						
2348	2348	1						2 OF 2			

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Newland Sierra

Job #: 2660-02

Run Name:
P-34-9.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2348	2346	3	821	814	205						
2346	2346	11						ADD BANK 2			
2346	2346	12						CLEAR BANK 2			
2346	2329	3	814	803	100						
2329	2329	10						SAVE TO BANK 2			
2347	2346.5	2	832	830	100	0.6	0.13				
2346.5	2330	5	830	817	420			VALLEY			
2346.5	2330	8				0.6	2.24				
2330	2330	11						ADD BANK 1			
2330	2330	12						CLEAR BANK 1			
2330	2329	3	812	803	60						
2329	2329	1						1 OF 2			
2327	2326.9	2	827	825	100	0.6	0.29				
2326.9	2325.8	5	825	821	200			VALLEY			
2326.9	2325.8	8				0.6	0.96				
2326.8	2326.7	3	821	808.5	65						
2326.7	2326.6	5	808.5	808	50			VALLEY			
2326.7	2326.6	8				0.3	0.14				
2326.6	2329	3	803.5	803	50						
2329	2329	1						2 OF 2			
2329	2329	11						ADD BANK 2			
2329	2329	12						CLEAR BANK 2			
2329	3495	3	803	766							
3495	3495	10						SAVE TO BANK 1			
2328	2326.5	2	820	815	85	0.9	0.12				
2326.5	2326	6	815	803.9	220	0.9	0.31				
2326	2323	3	797.9	787.1	320						
2323	2323	1						1 OF 2			
2325	2324	2	803.9	801.5	75	0.9	0.10				
2324	2323	6	801.5	793.1	320	0.9	0.45	2 SIDES			
2323	2323	1						2 OF 2			
2323	2321	3	787.1	773	405						
2321	2321	1						1 OF 2			
2323	2322	2	793.1	791	75	0.9	0.10				
2322	2321	6	791	783	325	0.9	0.46	2 SIDES			
2321	2321	1						2 OF 2			
2321	2319	3	773	766	535						
2319	2319	1						1 OF 2			

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Newland Sierra

Job #: 2660-02

Run Name:
P-34-9.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2321	2320	2	783	781.2	75	0.9	0.11				
2320	2319	6	781.2	772	440	0.9	0.78	2 SIDES			
2319	2319	1						2 OF 2			
2319	2318	3	766	760.2	90						
2318	2317	5	760.2	760	20			VALLEY			
2318	2317	8				0.3	0.56				
2317	3500	3	760	759.4	85						
3500	3500	10						SAVE TO BANK 2			
3575	3572	2	812.2	811.3	80	0.9	0.09				
3572	3571	6	811.3	806.3	300	0.9	0.37	1 SIDE			
3571	3569	5	805	804.2	80			VALLEY			
3571	3569	8				0.3	0.10				
3569	3565.5	3	798.2	797.3	90						
3565.5	3565.5	1						1 OF 2			
2412	2411	2	985	955	90	0.42	0.08				
2411	2410.8	5	955	805	1220						
2411	2410.8	8				0.42	9.72				
2410.8	3565.5	3	805	797.3	50						
3565.5	3565.5	1						2 OF 2			
3565.5	3565	3	797.3	787.3	240						
3565	3565	1						1 OF 2			
3568	3567	2	806.4	803.8	80	0.9	0.09				
3567	3566.5	6	803.8	794	260	0.9	0.30	1 SIDE			
3566.5	3566	5	794	793.8	15			VALLEY			
3566.5	3566	8				0.3	0.07				
3566	3565	3	787.8	787.3	50						
3565	3565	1						2 OF 2			
3565	3500	3	787.3	759.4	620						
3500	3500	11						ADD BANK 2			
3500	3500	12									
3500	3495	3	759.4	758.5	84						
3495	3495	11						ADD BANK 1			
3495	34.9	3	758.5	756.2	235						

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 34.9                                                         *
 ************************************************************************

  FILE NAME: P-34-9.DAT
  TIME/DATE OF STUDY: 13:37 12/08/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2340.00 TO NODE   2339.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    867.70
  DOWNSTREAM ELEVATION(FEET) =    865.00
  ELEVATION DIFFERENCE(FEET) =      2.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.034
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE   2339.00 TO NODE   2338.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  865.00  DOWNSTREAM ELEVATION(FEET) =  853.00
  STREET LENGTH(FEET) =   700.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   13.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.39
  STREET FLOW TRAVEL TIME(MIN.) =   3.35   Tc(MIN.) =    5.38
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.793
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.50      SUBAREA RUNOFF(CFS) =   11.87
  TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =      12.74

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.39
  FLOW VELOCITY(FEET/SEC.) =  4.05   DEPTH*VELOCITY(FT*FT/SEC.) =   1.92
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2338.00 =     775.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2338.00 TO NODE   2335.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   847.00  DOWNSTREAM(FEET) =   834.00
  FLOW LENGTH(FEET) =   410.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.74
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    6.01
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2335.00 =    1185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2335.00 TO NODE   2335.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.01
  RAINFALL INTENSITY(INCH/HR) =   8.19
  TOTAL STREAM AREA(ACRES) =     1.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.74

****************************************************************************
  FLOW PROCESS FROM NODE   2337.00 TO NODE   2336.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    854.70
  DOWNSTREAM ELEVATION(FEET) =    851.90
```

```
  ELEVATION DIFFERENCE(FEET) =      2.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.231
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE   2336.00 TO NODE   2335.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  851.90  DOWNSTREAM ELEVATION(FEET) =  840.00
  STREET LENGTH(FEET) =   370.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.49
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.40
  STREET FLOW TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =    3.71
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    8.30
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       9.21

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.50
  FLOW VELOCITY(FEET/SEC.) =  4.75   DEPTH*VELOCITY(FT*FT/SEC.) =   1.88
  LONGEST FLOWPATH FROM NODE   2337.00 TO NODE   2335.00 =     455.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2335.00 TO NODE   2335.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.71
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     1.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.21

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       12.74     6.01        8.191          1.61
     2        9.21     3.71        9.222          1.11

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       17.09     3.71       9.222
     2       20.92     6.01       8.191

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      20.92   Tc(MIN.) =    6.01
 TOTAL AREA(ACRES) =        2.7
 LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2335.00 =    1185.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2335.00 TO NODE   2332.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   834.00  DOWNSTREAM(FEET) =   818.20
 FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.56
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      20.92
 PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    6.44
 LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2332.00 =    1540.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2332.00 TO NODE   2332.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.44
 RAINFALL INTENSITY(INCH/HR) =   7.83
 TOTAL STREAM AREA(ACRES) =     2.72
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.92

****************************************************************************
 FLOW PROCESS FROM NODE   2334.00 TO NODE   2333.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
 UPSTREAM ELEVATION(FEET) =    841.70
 DOWNSTREAM ELEVATION(FEET) =    837.70
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.981
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.83
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
 FLOW PROCESS FROM NODE   2333.00 TO NODE   2332.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  837.70  DOWNSTREAM ELEVATION(FEET) =  820.00
 STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 39.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.53
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.26
  HALFSTREET FLOOD WIDTH(FEET) =    6.73
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.43
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
 STREET FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =    3.16
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 SUBAREA AREA(ACRES) =    0.41      SUBAREA RUNOFF(CFS) =    3.40
 TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       4.23

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.58
 FLOW VELOCITY(FEET/SEC.) =  4.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.48
 LONGEST FLOWPATH FROM NODE   2334.00 TO NODE   2332.00 =     400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2332.00 TO NODE   2332.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.16
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     0.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.23

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       20.92     6.44        7.829          2.72
     2        4.23     3.16        9.222          0.51

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       22.00     3.16       9.222
     2       24.52     6.44       7.829
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      24.52   Tc(MIN.) =    6.44
  TOTAL AREA(ACRES) =        3.2
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2332.00 =    1540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   818.20  DOWNSTREAM(FEET) =   817.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.27
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.52
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    6.69
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2331.00 =    1660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    817.00  DOWNSTREAM(FEET) =    816.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =    25.00   CHANNEL SLOPE =  0.0120
  CHANNEL FLOW THRU SUBAREA(CFS) =      24.52
  FLOW VELOCITY(FEET/SEC) =   3.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.12   Tc(MIN.) =    6.81
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2330.00 =    1685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2330.00 TO NODE   2330.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2358.00 TO NODE   2357.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1180.00
  DOWNSTREAM ELEVATION(FEET) =   1165.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.390
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.785
  SUBAREA RUNOFF(CFS) =      0.52
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
  FLOW PROCESS FROM NODE   2357.00 TO NODE   2356.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1165.00  DOWNSTREAM(FEET) =   1055.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   490.00   CHANNEL SLOPE =  0.2245
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1715 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.52
  FLOW VELOCITY(FEET/SEC) =   2.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.52   Tc(MIN.) =    8.91
  LONGEST FLOWPATH FROM NODE   2358.00 TO NODE   2356.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2357.00 TO NODE   2356.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.352
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =    6.15   SUBAREA RUNOFF(CFS) =   16.41
  TOTAL AREA(ACRES) =        6.3   TOTAL RUNOFF(CFS) =      16.78
  TC(MIN.) =    8.91

****************************************************************************
  FLOW PROCESS FROM NODE   2356.00 TO NODE   2355.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =    850.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   935.00   CHANNEL SLOPE =  0.2193
```

```
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1696 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      16.78
  FLOW VELOCITY(FEET/SEC) =   5.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.64   Tc(MIN.) =   11.55
  LONGEST FLOWPATH FROM NODE   2358.00 TO NODE   2355.00 =    1515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2356.00 TO NODE   2355.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.373
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =   13.59   SUBAREA RUNOFF(CFS) =   30.67
  TOTAL AREA(ACRES) =       19.9   TOTAL RUNOFF(CFS) =      44.86
  TC(MIN.) =   11.55

****************************************************************************
  FLOW PROCESS FROM NODE   2355.00 TO NODE   2346.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   824.00  DOWNSTREAM(FEET) =   814.00
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.97
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      44.86
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   11.72
  LONGEST FLOWPATH FROM NODE   2358.00 TO NODE   2346.00 =    1700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2346.00 TO NODE   2346.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2354.00 TO NODE   2353.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1300.00
  DOWNSTREAM ELEVATION(FEET) =   1275.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.682
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.492
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE   2353.00 TO NODE   2352.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1275.00  DOWNSTREAM(FEET) =   1055.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   580.00   CHANNEL SLOPE =  0.3793
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2104 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.32
  FLOW VELOCITY(FEET/SEC) =   2.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =    9.45
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2352.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2353.00 TO NODE   2352.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.118
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =    5.10   SUBAREA RUNOFF(CFS) =   13.11
  TOTAL AREA(ACRES) =        5.2   TOTAL RUNOFF(CFS) =      13.34
  TC(MIN.) =    9.45

****************************************************************************
  FLOW PROCESS FROM NODE   2352.00 TO NODE   2351.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =    845.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   950.00   CHANNEL SLOPE =  0.2211
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1704 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      13.34
 FLOW VELOCITY(FEET/SEC) =   5.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   12.34
 LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2351.00 =    1630.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2352.00 TO NODE   2351.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.150
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
 SUBAREA AREA(ACRES) =   10.54   SUBAREA RUNOFF(CFS) =   22.80
 TOTAL AREA(ACRES) =       15.7   TOTAL RUNOFF(CFS) =      34.03
 TC(MIN.) =   12.34

****************************************************************************
 FLOW PROCESS FROM NODE   2351.00 TO NODE   2348.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   839.00  DOWNSTREAM(FEET) =   821.00
 FLOW LENGTH(FEET) =   390.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.05
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      34.03
 PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   12.74
 LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2348.00 =    2020.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2348.00 TO NODE   2348.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.74
 RAINFALL INTENSITY(INCH/HR) =   5.04
 TOTAL STREAM AREA(ACRES) =    15.73
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.03

****************************************************************************
  FLOW PROCESS FROM NODE   2350.00 TO NODE   2349.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =    842.00
  DOWNSTREAM ELEVATION(FEET) =    841.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.095
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.67
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.358
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2349.50 TO NODE   2349.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    841.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   235.00   CHANNEL SLOPE =  0.0255
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.57
  FLOW VELOCITY(FEET/SEC) =   2.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =    8.73
  LONGEST FLOWPATH FROM NODE   2350.00 TO NODE   2349.00 =     325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2349.50 TO NODE   2349.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.438
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6000
  SUBAREA AREA(ACRES) =    2.68   SUBAREA RUNOFF(CFS) =   10.35
```

```
  TOTAL AREA(ACRES) =        2.8   TOTAL RUNOFF(CFS) =      10.85
  TC(MIN.) =    8.73

****************************************************************************
  FLOW PROCESS FROM NODE   2349.00 TO NODE   2348.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   829.00  DOWNSTREAM(FEET) =   821.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.65
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.85
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    8.85
  LONGEST FLOWPATH FROM NODE   2350.00 TO NODE   2348.00 =     430.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2348.00 TO NODE   2348.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.85
  RAINFALL INTENSITY(INCH/HR) =   6.38
  TOTAL STREAM AREA(ACRES) =     2.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.85

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       34.03    12.74        5.044         15.73
      2       10.85     8.85        6.381          2.81

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       34.48     8.85       6.381
      2       42.60    12.74       5.044

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      42.60   Tc(MIN.) =   12.74
  TOTAL AREA(ACRES) =       18.5
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2348.00 =    2020.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2348.00 TO NODE   2346.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   821.00  DOWNSTREAM(FEET) =   814.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.12
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.60
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   12.97
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2346.00 =    2225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2346.00 TO NODE   2346.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       42.60    12.97       4.987       18.54
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2346.00 =    2225.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       44.86    11.72       5.322       19.88
  LONGEST FLOWPATH FROM NODE   2358.00 TO NODE   2346.00 =    1700.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      83.38      11.72        5.322
      2      84.64      12.97        4.987

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.64   Tc(MIN.) =   12.97
  TOTAL AREA(ACRES) =       38.4

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2346.00 TO NODE   2346.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2346.00 TO NODE   2329.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   814.00  DOWNSTREAM(FEET) =   803.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.60
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      84.64
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   13.03
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2329.00 =    2325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2329.00 TO NODE   2329.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2347.00 TO NODE   2346.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    832.00
  DOWNSTREAM ELEVATION(FEET) =    830.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.389
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.873
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2346.50 TO NODE   2330.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    830.00  DOWNSTREAM(FEET) =    817.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   420.00   CHANNEL SLOPE =  0.0310
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.61
 FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =    9.04
 LONGEST FLOWPATH FROM NODE   2347.00 TO NODE   2330.00 =     520.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2346.50 TO NODE   2330.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.293
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6000
 SUBAREA AREA(ACRES) =    2.24   SUBAREA RUNOFF(CFS) =    8.46
 TOTAL AREA(ACRES) =        2.4   TOTAL RUNOFF(CFS) =       8.95
 TC(MIN.) =    9.04

****************************************************************************
 FLOW PROCESS FROM NODE   2330.00 TO NODE   2330.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        8.95     9.04       6.293        2.37
 LONGEST FLOWPATH FROM NODE   2347.00 TO NODE   2330.00 =     520.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       24.52     6.81       7.558        3.23
 LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2330.00 =    1685.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
```

```
     1      31.25       6.81        7.558
     2      29.36       9.04        6.293

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.25   Tc(MIN.) =    6.81
  TOTAL AREA(ACRES) =        5.6

****************************************************************************
  FLOW PROCESS FROM NODE   2330.00 TO NODE   2330.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2330.00 TO NODE   2329.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   812.00  DOWNSTREAM(FEET) =   803.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.32
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.25
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.85
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2329.00 =    1745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2329.00 TO NODE   2329.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.85
  RAINFALL INTENSITY(INCH/HR) =   7.53
  TOTAL STREAM AREA(ACRES) =     5.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.25

****************************************************************************
  FLOW PROCESS FROM NODE   2327.00 TO NODE   2326.90 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    827.00
  DOWNSTREAM ELEVATION(FEET) =    825.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.389
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.873
  SUBAREA RUNOFF(CFS) =      1.37
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.37

****************************************************************************
  FLOW PROCESS FROM NODE   2326.90 TO NODE   2326.80 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    821.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   200.00   CHANNEL SLOPE =  0.0200
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.37
  FLOW VELOCITY(FEET/SEC) =   2.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =    7.87
  LONGEST FLOWPATH FROM NODE   2327.00 TO NODE   2326.80 =     300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2326.90 TO NODE   2326.80 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.883
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6000
  SUBAREA AREA(ACRES) =    0.96   SUBAREA RUNOFF(CFS) =    3.96
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       5.16
  TC(MIN.) =    7.87

****************************************************************************
  FLOW PROCESS FROM NODE   2326.80 TO NODE   2326.70 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   821.00  DOWNSTREAM(FEET) =   808.50
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
```

```
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.60
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.16
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    7.93
  LONGEST FLOWPATH FROM NODE   2327.00 TO NODE   2326.70 =     365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2326.70 TO NODE   2326.60 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    808.50  DOWNSTREAM(FEET) =    808.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       5.16
  FLOW VELOCITY(FEET/SEC) =   2.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.39   Tc(MIN.) =    8.33
  LONGEST FLOWPATH FROM NODE   2327.00 TO NODE   2326.60 =     415.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2326.70 TO NODE   2326.60 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.637
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5698
  SUBAREA AREA(ACRES) =    0.14   SUBAREA RUNOFF(CFS) =    0.28
  TOTAL AREA(ACRES) =        1.4   TOTAL RUNOFF(CFS) =       5.26
  TC(MIN.) =    8.33

****************************************************************************
  FLOW PROCESS FROM NODE   2326.60 TO NODE   2329.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   803.50  DOWNSTREAM(FEET) =   803.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.26
```

```
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    8.47
  LONGEST FLOWPATH FROM NODE   2327.00 TO NODE   2329.00 =     465.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2329.00 TO NODE   2329.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.47
  RAINFALL INTENSITY(INCH/HR) =   6.56
  TOTAL STREAM AREA(ACRES) =     1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.26

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       31.25     6.85        7.529          5.60
      2        5.26     8.47        6.563          1.39

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       35.50     6.85       7.529
      2       32.50     8.47       6.563

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      35.50   Tc(MIN.) =    6.85
  TOTAL AREA(ACRES) =        7.0
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2329.00 =    1745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2329.00 TO NODE   2329.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       35.50     6.85       7.529        6.99
  LONGEST FLOWPATH FROM NODE   2340.00 TO NODE   2329.00 =    1745.00 FEET.
```

```
  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       84.64    13.03        4.972       38.42
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   2329.00 =    2325.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF        Tc       INTENSITY
  NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
      1      79.99        6.85        7.529
      2     108.09       13.03        4.972

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     108.09   Tc(MIN.) =   13.03
  TOTAL AREA(ACRES) =       45.4

****************************************************************************
  FLOW PROCESS FROM NODE   2329.00 TO NODE   2329.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2329.00 TO NODE   3495.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   803.00  DOWNSTREAM(FEET) =   766.00
  FLOW LENGTH(FEET) =  1635.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.11
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     108.09
  PIPE TRAVEL TIME(MIN.) =   1.69    Tc(MIN.) =   14.72
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   3495.00 =    3960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3495.00 TO NODE   3495.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2328.00 TO NODE   2326.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    820.00
  DOWNSTREAM ELEVATION(FEET) =    815.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.839
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.00
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE   2326.50 TO NODE   2326.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  815.00  DOWNSTREAM ELEVATION(FEET) =  803.90
  STREET LENGTH(FEET) =   220.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.28
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
  STREET FLOW TRAVEL TIME(MIN.) =   1.00   Tc(MIN.) =    2.84
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.31      SUBAREA RUNOFF(CFS) =    2.57
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.57
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.77
  FLOW VELOCITY(FEET/SEC.) =  3.95   DEPTH*VELOCITY(FT*FT/SEC.) =   0.96
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2326.00 =     305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2326.00 TO NODE   2323.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   797.90  DOWNSTREAM(FEET) =   787.10
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.03
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.57
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =    3.51
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2323.00 =     625.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2323.00 TO NODE   2323.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.51
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.57

****************************************************************************
  FLOW PROCESS FROM NODE   2325.00 TO NODE   2324.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    803.90
  DOWNSTREAM ELEVATION(FEET) =    801.50
  ELEVATION DIFFERENCE(FEET) =      2.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.116
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   2324.00 TO NODE   2323.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  801.50  DOWNSTREAM ELEVATION(FEET) =  793.10
  STREET LENGTH(FEET) =   320.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.70
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.71
  STREET FLOW TRAVEL TIME(MIN.) =   1.85   Tc(MIN.) =    3.96
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    3.73
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       4.56

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.69
  FLOW VELOCITY(FEET/SEC.) =  3.22   DEPTH*VELOCITY(FT*FT/SEC.) =   0.90
  LONGEST FLOWPATH FROM NODE   2325.00 TO NODE   2323.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2323.00 TO NODE   2323.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.96
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.56

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.57     3.51        9.222          0.43
      2        4.56     3.96        9.222          0.55

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.61     3.51       9.222
      2        8.13     3.96       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.13   Tc(MIN.) =    3.96
  TOTAL AREA(ACRES) =        1.0
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2323.00 =     625.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2323.00 TO NODE   2321.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   787.10  DOWNSTREAM(FEET) =   773.00
  FLOW LENGTH(FEET) =   405.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.17
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.13
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =    4.63
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2321.00 =    1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2321.00 TO NODE   2321.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.63
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.13

******************************************************************************
  FLOW PROCESS FROM NODE   2323.00 TO NODE   2322.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    793.10
  DOWNSTREAM ELEVATION(FEET) =    791.00
  ELEVATION DIFFERENCE(FEET) =      2.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.212
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

******************************************************************************
  FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) =  791.00  DOWNSTREAM ELEVATION(FEET) =  783.00
  STREET LENGTH(FEET) =   325.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.74
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
```

```
   HALFSTREET FLOOD WIDTH(FEET) =    6.11
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
  STREET FLOW TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =    4.16
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.46      SUBAREA RUNOFF(CFS) =    3.82
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       4.65

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.89
  FLOW VELOCITY(FEET/SEC.) =  3.14   DEPTH*VELOCITY(FT*FT/SEC.) =   0.89
  LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2321.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2321.00 TO NODE   2321.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.16
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.65

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.13     4.63        9.222          0.98
      2        4.65     4.16        9.222          0.56

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.78     4.16       9.222
      2       12.78     4.63       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.78   Tc(MIN.) =    4.63
```

```
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2321.00 =    1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2321.00 TO NODE   2319.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   773.00  DOWNSTREAM(FEET) =   766.00
  FLOW LENGTH(FEET) =   535.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.83
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.78
  PIPE TRAVEL TIME(MIN.) =   1.14    Tc(MIN.) =    5.77
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2319.00 =    1565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2319.00 TO NODE   2319.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.77
  RAINFALL INTENSITY(INCH/HR) =   8.41
  TOTAL STREAM AREA(ACRES) =     1.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.78

****************************************************************************
  FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    783.00
  DOWNSTREAM ELEVATION(FEET) =    781.20
  ELEVATION DIFFERENCE(FEET) =      1.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.329
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.91
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2320.00 TO NODE   2319.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  781.20  DOWNSTREAM ELEVATION(FEET) =  772.00
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.75
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
  STREET FLOW TRAVEL TIME(MIN.) =   2.54   Tc(MIN.) =    4.87
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.78      SUBAREA RUNOFF(CFS) =    6.47
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       7.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.08
  FLOW VELOCITY(FEET/SEC.) =  3.26   DEPTH*VELOCITY(FT*FT/SEC.) =   1.07
  LONGEST FLOWPATH FROM NODE   2321.00 TO NODE   2319.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2319.00 TO NODE   2319.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    4.87
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       12.78     5.77        8.412          1.54
      2        7.39     4.87        9.222          0.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.04     4.87       9.222
      2       19.52     5.77       8.412

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.52   Tc(MIN.) =    5.77
  TOTAL AREA(ACRES) =        2.4
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2319.00 =    1565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2319.00 TO NODE   2318.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   766.00  DOWNSTREAM(FEET) =   760.20
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.80
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.52
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    5.86
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2318.00 =    1655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2318.00 TO NODE   2317.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    760.20  DOWNSTREAM(FEET) =    760.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    20.00   CHANNEL SLOPE =  0.0100
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.52
  FLOW VELOCITY(FEET/SEC) =   2.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =    5.97
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   2317.00 =    1675.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2318.00 TO NODE   2317.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.222
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7876
  SUBAREA AREA(ACRES) =    0.56   SUBAREA RUNOFF(CFS) =    1.38
  TOTAL AREA(ACRES) =        3.0   TOTAL RUNOFF(CFS) =      19.52
  TC(MIN.) =    5.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE   2317.00 TO NODE   3500.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   760.00  DOWNSTREAM(FEET) =   759.40
  FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.88
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.52
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    6.18
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   3500.00 =    1760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3500.00 TO NODE   3500.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3575.00 TO NODE   3572.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    812.20
  DOWNSTREAM ELEVATION(FEET) =    811.30
  ELEVATION DIFFERENCE(FEET) =      0.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.831
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.88
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3572.00 TO NODE   3571.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  811.30  DOWNSTREAM ELEVATION(FEET) =  806.30
  STREET LENGTH(FEET) =   300.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.28
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.80
  STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =    4.70
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.37      SUBAREA RUNOFF(CFS) =    3.07
```

```
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       3.82

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.69
  FLOW VELOCITY(FEET/SEC.) =  3.03   DEPTH*VELOCITY(FT*FT/SEC.) =   1.03
  LONGEST FLOWPATH FROM NODE   3575.00 TO NODE   3571.00 =     380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3571.00 TO NODE   3569.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    805.00  DOWNSTREAM(FEET) =    804.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =    80.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.82
  FLOW VELOCITY(FEET/SEC) =   1.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.67   Tc(MIN.) =    5.37
  LONGEST FLOWPATH FROM NODE   3575.00 TO NODE   3569.00 =     460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3571.00 TO NODE   3569.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.803
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7929
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.26
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       3.91
  TC(MIN.) =    5.37

****************************************************************************
  FLOW PROCESS FROM NODE   3569.00 TO NODE   3565.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   798.20  DOWNSTREAM(FEET) =   797.30
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.30
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.91
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    5.66
```

```
 LONGEST FLOWPATH FROM NODE   3575.00 TO NODE   3565.50 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3565.50 TO NODE   3565.50 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.66
 RAINFALL INTENSITY(INCH/HR) =   8.52
 TOTAL STREAM AREA(ACRES) =     0.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.91

****************************************************************************
 FLOW PROCESS FROM NODE   2412.00 TO NODE   2411.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
 UPSTREAM ELEVATION(FEET) =    985.00
 DOWNSTREAM ELEVATION(FEET) =    955.00
 ELEVATION DIFFERENCE(FEET) =     30.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.390
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.785
 SUBAREA RUNOFF(CFS) =      0.30
 TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
 FLOW PROCESS FROM NODE   2411.00 TO NODE   2410.80 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    805.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1220.00   CHANNEL SLOPE =  0.1230
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1170 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.30
 FLOW VELOCITY(FEET/SEC) =   1.92 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  10.62   Tc(MIN.) =   16.01
 LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   2410.80 =    1310.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2411.00 TO NODE   2410.80 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.354
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
  SUBAREA AREA(ACRES) =    9.72   SUBAREA RUNOFF(CFS) =   17.77
  TOTAL AREA(ACRES) =        9.8   TOTAL RUNOFF(CFS) =      17.92
  TC(MIN.) =   16.01

****************************************************************************
  FLOW PROCESS FROM NODE   2410.80 TO NODE   3565.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   805.00  DOWNSTREAM(FEET) =   797.30
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.64
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.92
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   16.05
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3565.50 =    1360.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3565.50 TO NODE   3565.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.05
  RAINFALL INTENSITY(INCH/HR) =   4.35
  TOTAL STREAM AREA(ACRES) =     9.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.92

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.91     5.66        8.516          0.56
      2       17.92    16.05        4.347          9.80
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.23     5.66       8.516
      2       19.92    16.05       4.347

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.92   Tc(MIN.) =   16.05
  TOTAL AREA(ACRES) =       10.4
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3565.50 =    1360.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3565.50 TO NODE   3565.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   797.30  DOWNSTREAM(FEET) =   787.30
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.92
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   16.35
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3565.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3565.00 TO NODE   3565.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.35
  RAINFALL INTENSITY(INCH/HR) =   4.29
  TOTAL STREAM AREA(ACRES) =    10.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.92

****************************************************************************
  FLOW PROCESS FROM NODE   3568.00 TO NODE   3567.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    806.40
  DOWNSTREAM ELEVATION(FEET) =    803.80
  ELEVATION DIFFERENCE(FEET) =      2.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.174
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3567.00 TO NODE   3566.50 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  803.80  DOWNSTREAM ELEVATION(FEET) =  794.00
  STREET LENGTH(FEET) =   260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.99
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.60
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.93
  STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =    3.38
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.30      SUBAREA RUNOFF(CFS) =    2.49
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
 DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.37
 FLOW VELOCITY(FEET/SEC.) =  3.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.16
 LONGEST FLOWPATH FROM NODE   3568.00 TO NODE   3566.50 =     340.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3566.50 TO NODE   3566.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    794.00  DOWNSTREAM(FEET) =    793.80
 CHANNEL LENGTH THRU SUBAREA(FEET) =    15.00   CHANNEL SLOPE =  0.0133
 CHANNEL FLOW THRU SUBAREA(CFS) =       3.24
 FLOW VELOCITY(FEET/SEC) =   2.21 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =    3.49
 LONGEST FLOWPATH FROM NODE   3568.00 TO NODE   3566.00 =     355.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3566.50 TO NODE   3566.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8087
 SUBAREA AREA(ACRES) =    0.07   SUBAREA RUNOFF(CFS) =    0.19
 TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       3.43
 TC(MIN.) =    3.49

****************************************************************************
 FLOW PROCESS FROM NODE   3566.00 TO NODE   3565.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   787.80  DOWNSTREAM(FEET) =   787.30
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.12
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.43
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    3.65
 LONGEST FLOWPATH FROM NODE   3568.00 TO NODE   3565.00 =     405.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3565.00 TO NODE   3565.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.65
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.43

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       19.92    16.35        4.295         10.36
      2        3.43     3.65        9.222          0.46

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.71     3.65       9.222
      2       21.51    16.35       4.295

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.51   Tc(MIN.) =   16.35
  TOTAL AREA(ACRES) =       10.8
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3565.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3565.00 TO NODE   3500.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   787.30  DOWNSTREAM(FEET) =   759.40
  FLOW LENGTH(FEET) =   620.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.23
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.51
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =   17.08
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3500.00 =    2220.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3500.00 TO NODE   3500.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       21.51    17.08       4.176       10.82
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3500.00 =    2220.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       19.52     6.18       8.045        2.99
  LONGEST FLOWPATH FROM NODE   2328.00 TO NODE   3500.00 =    1760.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      27.30       6.18        8.045
      2      31.64      17.08        4.176

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.64   Tc(MIN.) =   17.08
  TOTAL AREA(ACRES) =       13.8

****************************************************************************
  FLOW PROCESS FROM NODE   3500.00 TO NODE   3495.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   759.40  DOWNSTREAM(FEET) =   758.50
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.09
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.64
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   17.23
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3495.00 =    2304.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3495.00 TO NODE   3495.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       31.64    17.23       4.152       13.81
  LONGEST FLOWPATH FROM NODE   2412.00 TO NODE   3495.00 =    2304.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      108.09    14.72       4.596       45.41
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE   3495.00 =    3960.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     135.12      14.72        4.596
      2     129.29      17.23        4.152

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     135.12   Tc(MIN.) =   14.72
  TOTAL AREA(ACRES) =       59.2

****************************************************************************
  FLOW PROCESS FROM NODE   3495.00 TO NODE     34.90 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   758.50  DOWNSTREAM(FEET) =   756.20
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.54
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     135.12
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   15.03
  LONGEST FLOWPATH FROM NODE   2354.00 TO NODE     34.90 =    4195.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       59.2  TC(MIN.) =     15.03
  PEAK FLOW RATE(CFS)   =     135.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-0.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3515	3514	2	731	728.4	80	0.9	0.09				
3514	3513	6	728.4	725.6	405	0.9	0.46	1 SIDE			
3513	35	3	720.7	720	70						
							0.55				

```
**************************************************************************

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            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.0                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-0.DAT
  TIME/DATE OF STUDY: 13:12 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3515.00 TO NODE   3514.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    731.00
  DOWNSTREAM ELEVATION(FEET) =    728.40
  ELEVATION DIFFERENCE(FEET) =      2.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.174
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3514.00 TO NODE   3513.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  728.40  DOWNSTREAM ELEVATION(FEET) =  725.60
  STREET LENGTH(FEET) =   405.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.67
  STREET FLOW TRAVEL TIME(MIN.) =   3.46   Tc(MIN.) =    5.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.539
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.46      SUBAREA RUNOFF(CFS) =    3.54
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       4.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.43
  FLOW VELOCITY(FEET/SEC.) =  2.20   DEPTH*VELOCITY(FT*FT/SEC.) =   0.87
  LONGEST FLOWPATH FROM NODE   3515.00 TO NODE   3513.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3513.00 TO NODE     35.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   720.70  DOWNSTREAM(FEET) =   720.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.41
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.23
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    5.85
  LONGEST FLOWPATH FROM NODE   3515.00 TO NODE     35.00 =     555.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.6  TC(MIN.) =      5.85
  PEAK FLOW RATE(CFS)   =       4.23
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-1.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3524	3523	2	740	737.4	100	0.9	0.07				
3523	3522	6	737.4	729.4	515	0.9	0.57	1 SIDE			
3522	3521	5	728.5	728	50						
3522	3521	8				0.2	0.08				
3521	3517	3	726.2	725.7	50						
3517	3517	1						1 OF 2			
3520	3519	2	736	733.5	45	0.9	0.07				
3519	3518	6	733.5	729.4	260	0.9	0.29	1 SIDE			
3518	3517	5	728	727.5	50						
3517	3517	1						2 OF 2			
3517	35.1	3	725.7	725	70						
							1.08				

```
**************************************************************************

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                              Analysis prepared by:

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                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.1                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-1.DAT
  TIME/DATE OF STUDY: 11:57 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3524.00 TO NODE   3523.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    740.00
  DOWNSTREAM ELEVATION(FEET) =    737.40
  ELEVATION DIFFERENCE(FEET) =      2.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.470
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    89.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3523.00 TO NODE   3522.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  737.40  DOWNSTREAM ELEVATION(FEET) =  729.40
  STREET LENGTH(FEET) =   515.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   3.16   Tc(MIN.) =    5.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.538
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.57      SUBAREA RUNOFF(CFS) =    4.38
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       4.92

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.06
  FLOW VELOCITY(FEET/SEC.) =  3.13   DEPTH*VELOCITY(FT*FT/SEC.) =   1.15
  LONGEST FLOWPATH FROM NODE   3524.00 TO NODE   3522.00 =     615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3522.00 TO NODE   3521.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    728.50  DOWNSTREAM(FEET) =    728.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       4.92
  FLOW VELOCITY(FEET/SEC) =   2.10 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.40   Tc(MIN.) =    6.03
  LONGEST FLOWPATH FROM NODE   3524.00 TO NODE   3521.00 =     665.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3522.00 TO NODE   3521.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.172
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8222
  SUBAREA AREA(ACRES) =    0.08   SUBAREA RUNOFF(CFS) =    0.13
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.92
  TC(MIN.) =    6.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE   3521.00 TO NODE   3517.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   726.20  DOWNSTREAM(FEET) =   725.70
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.62
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.92
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    6.18
  LONGEST FLOWPATH FROM NODE   3524.00 TO NODE   3517.00 =     715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3517.00 TO NODE   3517.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.18
  RAINFALL INTENSITY(INCH/HR) =   8.04
  TOTAL STREAM AREA(ACRES) =     0.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.92

****************************************************************************
  FLOW PROCESS FROM NODE   3520.00 TO NODE   3519.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    736.00
  DOWNSTREAM ELEVATION(FEET) =    733.50
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.364
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3519.00 TO NODE   3518.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  733.50  DOWNSTREAM ELEVATION(FEET) =  729.40
  STREET LENGTH(FEET) =   260.00   CURB HEIGHT(INCHES) =  6.0
```

```
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.78
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.75
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
  STREET FLOW TRAVEL TIME(MIN.) =   1.75   Tc(MIN.) =    3.11
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.29      SUBAREA RUNOFF(CFS) =    2.41
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       2.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.81
  FLOW VELOCITY(FEET/SEC.) =  2.77   DEPTH*VELOCITY(FT*FT/SEC.) =   0.89
  LONGEST FLOWPATH FROM NODE   3520.00 TO NODE   3518.00 =     305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3518.00 TO NODE   3517.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    728.00  DOWNSTREAM(FEET) =    727.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.99
  FLOW VELOCITY(FEET/SEC) =   1.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.44   Tc(MIN.) =    3.56
  LONGEST FLOWPATH FROM NODE   3520.00 TO NODE   3517.00 =     355.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3517.00 TO NODE   3517.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.56
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.99

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.92     6.18        8.045          0.72
      2        2.99     3.56        9.222          0.36

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        5.82     3.56       9.222
      2        7.52     6.18       8.045

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.52   Tc(MIN.) =    6.18
  TOTAL AREA(ACRES) =        1.1
  LONGEST FLOWPATH FROM NODE   3524.00 TO NODE   3517.00 =     715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3517.00 TO NODE     35.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   725.70  DOWNSTREAM(FEET) =   725.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.20
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.52
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    6.37
  LONGEST FLOWPATH FROM NODE   3524.00 TO NODE     35.10 =     785.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.1  TC(MIN.) =      6.37
  PEAK FLOW RATE(CFS)   =       7.52
```

==========
==========

END OF RATIONAL METHOD ANALYSIS

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-2.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3531	3530	2	742.3	739.3	70	0.9	0.06				
3530	3529	6	739.3	737	140	0.9	0.14	1 SIDE			
3529	3526	3	733	730.7	228						
3526	3526	1						1 OF 2			
3528	3527	2	739.7	736.7	70	0.9	0.07				
3527	3526	6	736.7	733.7	190	0.9	0.19	1 SIDE			
3526	3526	1						2 OF 2			
3526	35.2	3	730.7	730	65						
							0.46				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.2                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-2.DAT
  TIME/DATE OF STUDY: 11:42 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3531.00 TO NODE   3530.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    742.30
  DOWNSTREAM ELEVATION(FEET) =    739.30
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.854
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   3530.00 TO NODE   3529.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  739.30  DOWNSTREAM ELEVATION(FEET) =  737.00
  STREET LENGTH(FEET) =   140.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.08
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    5.98
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.56
  STREET FLOW TRAVEL TIME(MIN.) =   1.03   Tc(MIN.) =    2.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.14      SUBAREA RUNOFF(CFS) =    1.16
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       1.66

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.41
  FLOW VELOCITY(FEET/SEC.) =  2.49   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
  LONGEST FLOWPATH FROM NODE   3531.00 TO NODE   3529.00 =     210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3529.00 TO NODE   3526.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   733.00  DOWNSTREAM(FEET) =   730.70
  FLOW LENGTH(FEET) =   228.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.19
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.66
  PIPE TRAVEL TIME(MIN.) =   0.91    Tc(MIN.) =    3.79
  LONGEST FLOWPATH FROM NODE   3531.00 TO NODE   3526.00 =     438.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3526.00 TO NODE   3526.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.79
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.66

****************************************************************************
  FLOW PROCESS FROM NODE   3528.00 TO NODE   3527.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
```

```
  UPSTREAM ELEVATION(FEET) =    739.70
  DOWNSTREAM ELEVATION(FEET) =    736.70
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.854
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3527.00 TO NODE   3526.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  736.70  DOWNSTREAM ELEVATION(FEET) =  733.70
  STREET LENGTH(FEET) =   190.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.62
  STREET FLOW TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =    3.20
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.19      SUBAREA RUNOFF(CFS) =    1.58
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       2.16

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.44
  FLOW VELOCITY(FEET/SEC.) =  2.60   DEPTH*VELOCITY(FT*FT/SEC.) =   0.77
  LONGEST FLOWPATH FROM NODE   3528.00 TO NODE   3526.00 =     260.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3526.00 TO NODE   3526.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.20
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.16

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.66     3.79        9.222          0.20
      2        2.16     3.20        9.222          0.26

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        3.56     3.20       9.222
      2        3.82     3.79       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.82   Tc(MIN.) =    3.79
  TOTAL AREA(ACRES) =        0.5
  LONGEST FLOWPATH FROM NODE   3531.00 TO NODE   3526.00 =     438.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3526.00 TO NODE     35.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   730.70  DOWNSTREAM(FEET) =   730.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.41
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.82
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    3.99
```

```
  LONGEST FLOWPATH FROM NODE   3531.00 TO NODE     35.20 =     503.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =         0.5  TC(MIN.) =      3.99
  PEAK FLOW RATE(CFS)   =        3.82
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-3.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3539	3538	2	748.2	746.3	75	0.9	0.07				
3538	3537	6	746.3	737.8	460	0.9	0.61	1 SIDE			
3538	3537	8				0.9	0.12				
3537	3533	3	741.5	735.6	60						
3533	3533	1						1 OF 2			
3535	3534	2	743	741.9	80	0.9	0.09				
3534	3533	6	741.9	739.7	140	0.9	0.14	1 SIDE			
3533	3533	1						2 OF 2			
3533	35.3	3	735.6	735	60						
							1.03				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.3                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-3.DAT
  TIME/DATE OF STUDY: 11:33 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3539.00 TO NODE   3538.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    748.20
  DOWNSTREAM ELEVATION(FEET) =    746.30
  ELEVATION DIFFERENCE(FEET) =      1.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3538.00 TO NODE   3537.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  746.30  DOWNSTREAM ELEVATION(FEET) =  737.80
  STREET LENGTH(FEET) =   460.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =    4.85
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.61      SUBAREA RUNOFF(CFS) =    5.06
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       5.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.33
  FLOW VELOCITY(FEET/SEC.) =  3.44   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
  LONGEST FLOWPATH FROM NODE   3539.00 TO NODE   3537.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3538.00 TO NODE   3537.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.9000
  SUBAREA AREA(ACRES) =    0.12   SUBAREA RUNOFF(CFS) =    1.00
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       6.64
  TC(MIN.) =    4.85

****************************************************************************
  FLOW PROCESS FROM NODE   3537.00 TO NODE   3533.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   741.50  DOWNSTREAM(FEET) =   735.60
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.64
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    4.92
  LONGEST FLOWPATH FROM NODE   3539.00 TO NODE   3533.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3533.00 TO NODE   3533.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.92
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.64

****************************************************************************
  FLOW PROCESS FROM NODE   3535.00 TO NODE   3534.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    743.00
  DOWNSTREAM ELEVATION(FEET) =    741.90
  ELEVATION DIFFERENCE(FEET) =      1.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.721
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    70.62
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3534.00 TO NODE   3533.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  741.90  DOWNSTREAM ELEVATION(FEET) =  739.70
  STREET LENGTH(FEET) =   140.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.33
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   1.00   Tc(MIN.) =    3.72
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.14      SUBAREA RUNOFF(CFS) =    1.16
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       1.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.03
  FLOW VELOCITY(FEET/SEC.) =  2.50   DEPTH*VELOCITY(FT*FT/SEC.) =   0.72
  LONGEST FLOWPATH FROM NODE   3535.00 TO NODE   3533.00 =     220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3533.00 TO NODE   3533.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.72
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.64     4.92        9.222          0.80
      2        1.91     3.72        9.222          0.23

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.93     3.72       9.222
      2        8.55     4.92       9.222
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       8.55   Tc(MIN.) =    4.92
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE   3539.00 TO NODE   3533.00 =     595.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3533.00 TO NODE     35.30 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   735.60  DOWNSTREAM(FEET) =   735.00
 FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.34
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.55
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    5.08
 LONGEST FLOWPATH FROM NODE   3539.00 TO NODE     35.30 =     655.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.0  TC(MIN.) =      5.08
 PEAK FLOW RATE(CFS)   =       8.55
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-4.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3547	3546	2	754.4	751	75	0.9	0.09				
3546	3545	6	751	747.2	260	0.9	0.30	1 SIDE			
3545	3544	3	743.8	742.5	130						
3544	3540.5	5	742.5	741.3	120						
3544	3540.5	8				0.2	0.13				
3540.5	3540.5	1						1 OF 2			
3543	3542	2	748.9	746.8	80	0.9	0.07				
3542	3541	6	746.8	744.1	150	0.9	0.18	1 SIDE			
3540.5	3540.5	1						2 OF 2			
3540.5	35.4	3	736.5	735	125						
							0.77				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.4                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-4.DAT
  TIME/DATE OF STUDY: 11:24 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3547.00 TO NODE   3546.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    754.40
  DOWNSTREAM ELEVATION(FEET) =    751.00
  ELEVATION DIFFERENCE(FEET) =      3.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.884
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3546.00 TO NODE   3545.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  751.00  DOWNSTREAM ELEVATION(FEET) =  747.20
  STREET LENGTH(FEET) =   260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.99
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =    3.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.30      SUBAREA RUNOFF(CFS) =    2.49
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.28
  FLOW VELOCITY(FEET/SEC.) =  2.75   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
  LONGEST FLOWPATH FROM NODE   3547.00 TO NODE   3545.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3545.00 TO NODE   3544.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   743.80  DOWNSTREAM(FEET) =   742.50
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.24
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    4.07
  LONGEST FLOWPATH FROM NODE   3547.00 TO NODE   3544.00 =     465.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3544.00 TO NODE   3540.50 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    742.50  DOWNSTREAM(FEET) =    741.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   120.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.24
  FLOW VELOCITY(FEET/SEC) =   1.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    5.12
  LONGEST FLOWPATH FROM NODE   3547.00 TO NODE   3540.50 =     585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3544.00 TO NODE   3540.50 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.084
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7250
  SUBAREA AREA(ACRES) =    0.13   SUBAREA RUNOFF(CFS) =    0.24
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       3.42
  TC(MIN.) =    5.12

****************************************************************************
  FLOW PROCESS FROM NODE   3540.50 TO NODE   3540.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.12
  RAINFALL INTENSITY(INCH/HR) =   9.08
  TOTAL STREAM AREA(ACRES) =     0.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.42

****************************************************************************
  FLOW PROCESS FROM NODE   3543.00 TO NODE   3542.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    748.90
  DOWNSTREAM ELEVATION(FEET) =    746.80
  ELEVATION DIFFERENCE(FEET) =      2.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.334
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3542.00 TO NODE   3541.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  746.80  DOWNSTREAM ELEVATION(FEET) =  744.10
  STREET LENGTH(FEET) =   150.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.63
  STREET FLOW TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =    3.36
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.18      SUBAREA RUNOFF(CFS) =    1.49
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       2.07

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.10
  FLOW VELOCITY(FEET/SEC.) =  2.68   DEPTH*VELOCITY(FT*FT/SEC.) =   0.77
  LONGEST FLOWPATH FROM NODE   3543.00 TO NODE   3541.00 =     230.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3540.50 TO NODE   3540.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.36
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.07

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.42     5.12        9.084          0.52
      2        2.07     3.36        9.222          0.25

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        4.32     3.36       9.222
      2        5.47     5.12       9.084

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.47   Tc(MIN.) =    5.12
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE   3547.00 TO NODE   3540.50 =     585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3540.50 TO NODE     35.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   736.50  DOWNSTREAM(FEET) =   735.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.18
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.47
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    5.46
  LONGEST FLOWPATH FROM NODE   3547.00 TO NODE     35.40 =     710.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.8  TC(MIN.) =      5.46
  PEAK FLOW RATE(CFS)   =       5.47
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-5.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3552	3551	2	757.4	755.9	80	0.9	0.08				
3551	3550	6	755.9	747.8	250	0.9	0.28	1 SIDE			
3550	3549	5	747.5	747.4	10						
3550	3549	8				0.2	0.10				
3549	35.5	3	742.5	740	120						
							0.46				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.5                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-5.DAT
  TIME/DATE OF STUDY: 11:08 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3552.00 TO NODE   3551.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    757.40
  DOWNSTREAM ELEVATION(FEET) =    755.90
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.581
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    78.12
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE   3551.00 TO NODE   3550.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  755.90  DOWNSTREAM ELEVATION(FEET) =  747.80
  STREET LENGTH(FEET) =   250.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.85
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.26   Tc(MIN.) =    3.84
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.28      SUBAREA RUNOFF(CFS) =    2.32
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       2.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.30
  FLOW VELOCITY(FEET/SEC.) =  3.70   DEPTH*VELOCITY(FT*FT/SEC.) =   1.08
  LONGEST FLOWPATH FROM NODE   3552.00 TO NODE   3550.00 =     330.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3550.00 TO NODE   3549.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    747.50  DOWNSTREAM(FEET) =    747.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =    10.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.99
  FLOW VELOCITY(FEET/SEC) =   1.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.09   Tc(MIN.) =    3.93
  LONGEST FLOWPATH FROM NODE   3552.00 TO NODE   3549.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3550.00 TO NODE   3549.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7478
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.18
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       3.17
  TC(MIN.) =    3.93

****************************************************************************
  FLOW PROCESS FROM NODE   3549.00 TO NODE     35.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   742.50  DOWNSTREAM(FEET) =   740.00
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.53
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.17
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    4.24
  LONGEST FLOWPATH FROM NODE   3552.00 TO NODE     35.50 =     460.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.5  TC(MIN.) =      4.24
  PEAK FLOW RATE(CFS)   =       3.17
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-6.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3558.5	3558	2	764.6	761.6	80	0.9	0.07				
3558	3557	6	761.6	759.2	130	0.9	0.12				
3557	3554	3	753.2	749.3	190						
3554	3554	1						1 OF 2			
3556	3555	2	760.9	757.9	80	0.9	0.10				
3555	3554	6	757.9	755.3	125	0.9	0.13	1 SIDE			
3554	3554	1						2 OF 2			
3554	35.6	3	749.3	743.4	135						
							0.42				

```
**************************************************************************

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                              Analysis prepared by:

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                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 35.6                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-35-6.DAT
  TIME/DATE OF STUDY: 10:52 11/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3559.00 TO NODE   3558.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    764.60
  DOWNSTREAM ELEVATION(FEET) =    761.60
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.073
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3558.00 TO NODE   3557.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  761.60  DOWNSTREAM ELEVATION(FEET) =  759.20
  STREET LENGTH(FEET) =   130.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.08
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.58
  STREET FLOW TRAVEL TIME(MIN.) =   0.91   Tc(MIN.) =    2.98
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    1.00
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       1.58

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.00
  FLOW VELOCITY(FEET/SEC.) =  2.59   DEPTH*VELOCITY(FT*FT/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE   3559.00 TO NODE   3557.00 =     210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3557.00 TO NODE   3554.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   753.20  DOWNSTREAM(FEET) =   749.30
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.33
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.58
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    3.57
  LONGEST FLOWPATH FROM NODE   3559.00 TO NODE   3554.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3554.00 TO NODE   3554.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.57
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.58

****************************************************************************
  FLOW PROCESS FROM NODE   3556.00 TO NODE   3555.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
```

```
  UPSTREAM ELEVATION(FEET) =    760.90
  DOWNSTREAM ELEVATION(FEET) =    757.90
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.073
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   3555.00 TO NODE   3554.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  757.90  DOWNSTREAM ELEVATION(FEET) =  755.30
  STREET LENGTH(FEET) =   125.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.60
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.66
  STREET FLOW TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =    2.87
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.13      SUBAREA RUNOFF(CFS) =    1.08
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       1.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.48
  FLOW VELOCITY(FEET/SEC.) =  2.82   DEPTH*VELOCITY(FT*FT/SEC.) =   0.78
  LONGEST FLOWPATH FROM NODE   3556.00 TO NODE   3554.00 =     205.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3554.00 TO NODE   3554.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.87
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.58     3.57        9.222          0.19
      2        1.91     2.87        9.222          0.23

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        3.18     2.87       9.222
      2        3.49     3.57       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.49   Tc(MIN.) =    3.57
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE   3559.00 TO NODE   3554.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3554.00 TO NODE     35.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   749.30  DOWNSTREAM(FEET) =   743.40
  FLOW LENGTH(FEET) =   135.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.75
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.49
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    3.83
```

```
  LONGEST FLOWPATH FROM NODE   3559.00 TO NODE     35.60 =     535.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =         0.4  TC(MIN.) =      3.83
  PEAK FLOW RATE(CFS)   =        3.49
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-35-7.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
3575	3574	2	812.2	811.2	80	0.9	0.09				
3574	3573	6	811.2	799.8	490	0.9	0.53				
3573	3559	3	793.8	753.5	1435						
3559	3559	1						1 OF 4			
3573	3564	2	799.8	797.2	75	0.9	0.09				
3564	3563	6	797.2	777.4	500	0.9	1.04				
3563	3559	3	771.4	753.5	940						
3559	3559	1						2 OF 4			
3562	3561	2	782.9	776.4	100	0.9	0.13				
3561	3560	6	776.4	760.6	535	0.9	1.15				
3560	3559	3	757.5	753.5	400						
3559	3559	1						3 OF 4			
3559.4	3559.2	2	767.1	763.8	70	0.9	0.07				
3559.2	3559	6	763.8	754	425	0.9	0.54				
3559	3559	1						4 OF 4			
3559	3558.9	5	754	753	100						
3559	3558.9	8					0.32				
3558.9	35.7	3	748	745	30						
							3.96				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 35.7                                                         *
 ************************************************************************

  FILE NAME: P-35-7.DAT
  TIME/DATE OF STUDY: 09:12 11/29/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3575.00 TO NODE   3574.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    812.20
  DOWNSTREAM ELEVATION(FEET) =    811.20
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.771
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    68.75
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3574.00 TO NODE   3573.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  811.20  DOWNSTREAM ELEVATION(FEET) =  799.80
  STREET LENGTH(FEET) =   490.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   2.53   Tc(MIN.) =    5.31
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.875
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.53      SUBAREA RUNOFF(CFS) =    4.23
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       4.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.17
  FLOW VELOCITY(FEET/SEC.) =  3.62   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
  LONGEST FLOWPATH FROM NODE   3575.00 TO NODE   3573.00 =     570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3573.00 TO NODE   3559.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   793.80  DOWNSTREAM(FEET) =   753.50
  FLOW LENGTH(FEET) =  1435.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.23
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.95
  PIPE TRAVEL TIME(MIN.) =   2.91    Tc(MIN.) =    8.21
  LONGEST FLOWPATH FROM NODE   3575.00 TO NODE   3559.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3559.00 TO NODE   3559.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.21
  RAINFALL INTENSITY(INCH/HR) =   6.70
  TOTAL STREAM AREA(ACRES) =     0.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.95

****************************************************************************
  FLOW PROCESS FROM NODE   3573.00 TO NODE   3564.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    799.80
  DOWNSTREAM ELEVATION(FEET) =    797.20
  ELEVATION DIFFERENCE(FEET) =      2.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.060
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   3564.00 TO NODE   3563.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  797.20  DOWNSTREAM ELEVATION(FEET) =  777.40
  STREET LENGTH(FEET) =   500.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.08
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.46
  STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =    3.93
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    8.63
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       9.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
 DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.02
 FLOW VELOCITY(FEET/SEC.) =  5.17   DEPTH*VELOCITY(FT*FT/SEC.) =   2.00
 LONGEST FLOWPATH FROM NODE   3573.00 TO NODE   3563.00 =     575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3563.00 TO NODE   3559.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   771.40  DOWNSTREAM(FEET) =   753.50
 FLOW LENGTH(FEET) =   940.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.37
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.38
 PIPE TRAVEL TIME(MIN.) =   1.87    Tc(MIN.) =    5.80
 LONGEST FLOWPATH FROM NODE   3573.00 TO NODE   3559.00 =    1515.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3559.00 TO NODE   3559.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  4
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.80
 RAINFALL INTENSITY(INCH/HR) =   8.38
 TOTAL STREAM AREA(ACRES) =     1.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.38

****************************************************************************
 FLOW PROCESS FROM NODE   3562.00 TO NODE   3561.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    782.90
 DOWNSTREAM ELEVATION(FEET) =    776.40
 ELEVATION DIFFERENCE(FEET) =      6.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.929
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.08
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      1.08
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3561.00 TO NODE   3560.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  776.40  DOWNSTREAM ELEVATION(FEET) =  760.60
  STREET LENGTH(FEET) =   535.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.85
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.38
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.47
  STREET FLOW TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =    4.08
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    9.54
  TOTAL AREA(ACRES) =        1.3        PEAK FLOW RATE(CFS) =      10.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.52
  FLOW VELOCITY(FEET/SEC.) =  4.77   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  LONGEST FLOWPATH FROM NODE   3562.00 TO NODE   3560.00 =     635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3560.00 TO NODE   3559.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   757.50  DOWNSTREAM(FEET) =   753.50
```

```
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.77
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.62
  PIPE TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =    5.07
  LONGEST FLOWPATH FROM NODE   3562.00 TO NODE   3559.00 =    1035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3559.00 TO NODE   3559.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.07
  RAINFALL INTENSITY(INCH/HR) =   9.14
  TOTAL STREAM AREA(ACRES) =     1.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.62

****************************************************************************
  FLOW PROCESS FROM NODE   3559.40 TO NODE   3559.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    767.10
  DOWNSTREAM ELEVATION(FEET) =    763.80
  ELEVATION DIFFERENCE(FEET) =      3.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.796
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   3559.20 TO NODE   3559.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  763.80  DOWNSTREAM ELEVATION(FEET) =  754.00
  STREET LENGTH(FEET) =   425.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.82
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.17
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96
  STREET FLOW TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =    4.03
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.54      SUBAREA RUNOFF(CFS) =    4.48
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       5.06

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.31
  FLOW VELOCITY(FEET/SEC.) =  3.62   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
  LONGEST FLOWPATH FROM NODE   3559.40 TO NODE   3559.00 =     495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3559.00 TO NODE   3559.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.03
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.95     8.21        6.697          0.62
      2        9.38     5.80        8.381          1.13
```

3	10.62	5.07	9.144	1.28
4	5.06	4.03	9.222	0.61

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 4 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	22.45	4.03	9.222
2	26.89	5.07	9.144
3	27.21	5.80	8.381
4	23.90	8.21	6.697

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 27.21 Tc(MIN.) = 5.80
TOTAL AREA(ACRES) = 3.6
LONGEST FLOWPATH FROM NODE 3575.00 TO NODE 3559.00 = 2005.00 FEET.

****
FLOW PROCESS FROM NODE 3559.00 TO NODE 3558.90 IS CODE = 52

>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 754.00 DOWNSTREAM(FEET) = 753.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 100.00 CHANNEL SLOPE = 0.0100
CHANNEL FLOW THRU SUBAREA(CFS) = 27.21
FLOW VELOCITY(FEET/SEC) = 3.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.51 Tc(MIN.) = 6.31
LONGEST FLOWPATH FROM NODE 3575.00 TO NODE 3558.90 = 2105.00 FEET.

****
FLOW PROCESS FROM NODE 3559.00 TO NODE 3558.90 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.937
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .2000
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.8434
SUBAREA AREA(ACRES) = 0.32 SUBAREA RUNOFF(CFS) = 0.51
TOTAL AREA(ACRES) = 4.0 TOTAL RUNOFF(CFS) = 27.21
TC(MIN.) = 6.31
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****

```
  FLOW PROCESS FROM NODE   3558.90 TO NODE     35.70 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   748.00  DOWNSTREAM(FEET) =   745.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.21
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.33
  LONGEST FLOWPATH FROM NODE   3575.00 TO NODE     35.70 =    2135.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.0  TC(MIN.) =      6.33
  PEAK FLOW RATE(CFS)   =      27.21
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-1.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
60	55	2	1168	1140	80	0.36	0.10				
55	40	5	1140	757	1590			VALLEY			
55	40	8				0.36	11.91				
40	40	1						1 OF 2			
50	45	2	1160	1125	80	0.36	0.16				
45	40	5	1125	757	1950			VALLEY			
45	40	8				0.36	19.80				
40	40	1						2 OF 2			
40	35	5	757	735	540			VALLEY			
40	35	8				0.4	13.01				
35	30	5	735	688	1770			VALLEY			
35	30	8				0.4	43.69				
30	5	5	688	676	1270			VALLEY			
30	5	8				0.41	10.87				
5	5	1						1 OF 4			
25	20	2	1205	1165	80	0.36	0.17				
20	15	5	1165	840	1610			MTN			
20	15	8				0.36	17.12				
15	10	5	840	775	1025			VALLEY			
15	10	8				0.36	11.50				
10	9	5	775	690	2230			VALLEY			
10	9	8				0.38	40.07				
9	5	5	690	676	1020			VALLEY			
9	5	8				0.4	30.65				
5	5	1						2 OF 4			
4938	4936	2	701	700.4	85	0.9	0.10				
4936	4934	6	700.4	689.9	860	0.9	1.13				
4934	5	3	683.9	676	740						
5	5	1						3 OF 4			
7	6	2	689.8	688	85	0.9	0.10				
6	5	6	688	680.6	670	0.9	0.75	ONE SIDE			
5	5	1						4 OF 4			
5	1	3	676	674.5	135						
1	1	1						1 OF 2			
4	3	2	700.7	700	65	0.9	0.08				
3	2	6	700	680.8	1675	0.9	1.99				
2	1	3	674.5	674	50						
1	1	1					203.20	2 OF 2			

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 1                                                          *
*                                                                        *
 **************************************************************************

  FILE NAME: P-1.DAT
  TIME/DATE OF STUDY: 10:24 12/05/2016
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     55.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1168.00
  DOWNSTREAM ELEVATION(FEET) =   1140.00
  ELEVATION DIFFERENCE(FEET) =     28.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.530
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.641
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     40.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =    757.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1590.00   CHANNEL SLOPE =  0.2409
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.31
  FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.59   Tc(MIN.) =   11.12
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     40.00 =    1670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     40.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.508
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
  SUBAREA AREA(ACRES) =   11.91   SUBAREA RUNOFF(CFS) =   23.62
  TOTAL AREA(ACRES) =       12.0   TOTAL RUNOFF(CFS) =      23.81
  TC(MIN.) =   11.12
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.12
  RAINFALL INTENSITY(INCH/HR) =   5.51
  TOTAL STREAM AREA(ACRES) =    12.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.81

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     45.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1160.00
  DOWNSTREAM ELEVATION(FEET) =   1125.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.530
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.641
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     40.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =    757.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1950.00   CHANNEL SLOPE =  0.1887
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.50
  FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.85   Tc(MIN.) =   12.38
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     40.00 =    2030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     40.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.138
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
  SUBAREA AREA(ACRES) =   19.80   SUBAREA RUNOFF(CFS) =   36.62
  TOTAL AREA(ACRES) =       20.0   TOTAL RUNOFF(CFS) =      36.92
  TC(MIN.) =   12.38

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.38
  RAINFALL INTENSITY(INCH/HR) =   5.14
  TOTAL STREAM AREA(ACRES) =    19.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.92

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       23.81    11.12        5.508         12.01
      2       36.92    12.38        5.138         19.96

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       56.96    11.12       5.508
      2       59.13    12.38       5.138

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      59.13   Tc(MIN.) =   12.38
  TOTAL AREA(ACRES) =       32.0
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     40.00 =    2030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     35.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    757.00  DOWNSTREAM(FEET) =    735.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.0407
  CHANNEL FLOW THRU SUBAREA(CFS) =      59.13
  FLOW VELOCITY(FEET/SEC) =   8.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   13.48
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     35.00 =    2570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     35.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.864
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3716
  SUBAREA AREA(ACRES) =   13.01   SUBAREA RUNOFF(CFS) =   25.31
  TOTAL AREA(ACRES) =       45.0   TOTAL RUNOFF(CFS) =      81.30
  TC(MIN.) =   13.48

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     30.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    688.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1770.00   CHANNEL SLOPE =  0.0266
  CHANNEL FLOW THRU SUBAREA(CFS) =      81.30
  FLOW VELOCITY(FEET/SEC) =   7.27 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.06   Tc(MIN.) =   17.54
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     30.00 =    4340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.105
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3856
  SUBAREA AREA(ACRES) =   43.69   SUBAREA RUNOFF(CFS) =   71.74
  TOTAL AREA(ACRES) =       88.7   TOTAL RUNOFF(CFS) =     140.34
```

```
  TC(MIN.) =   17.54

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE      5.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    688.00  DOWNSTREAM(FEET) =    676.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1270.00   CHANNEL SLOPE =  0.0094
  CHANNEL FLOW THRU SUBAREA(CFS) =     140.34
  FLOW VELOCITY(FEET/SEC) =   5.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.14   Tc(MIN.) =   21.68
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE      5.00 =    5610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE      5.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.580
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3882
  SUBAREA AREA(ACRES) =   10.87   SUBAREA RUNOFF(CFS) =   15.96
  TOTAL AREA(ACRES) =       99.5   TOTAL RUNOFF(CFS) =     140.34
  TC(MIN.) =   21.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.68
  RAINFALL INTENSITY(INCH/HR) =   3.58
  TOTAL STREAM AREA(ACRES) =    99.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    140.34

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     20.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1205.00
  DOWNSTREAM ELEVATION(FEET) =   1165.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.530
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.641
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     15.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1165.00  DOWNSTREAM(FEET) =    840.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1610.00   CHANNEL SLOPE =  0.2019
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1609 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.53
  FLOW VELOCITY(FEET/SEC) =   2.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  11.94   Tc(MIN.) =   17.47
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     15.00 =    1690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     15.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.114
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
  SUBAREA AREA(ACRES) =   17.12   SUBAREA RUNOFF(CFS) =   25.36
  TOTAL AREA(ACRES) =       17.3   TOTAL RUNOFF(CFS) =      25.61
  TC(MIN.) =   17.47

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     10.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    840.00  DOWNSTREAM(FEET) =    775.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.00   CHANNEL SLOPE =  0.0634
 CHANNEL FLOW THRU SUBAREA(CFS) =      25.61
 FLOW VELOCITY(FEET/SEC) =   8.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =   19.59
 LONGEST FLOWPATH FROM NODE     25.00 TO NODE     10.00 =    2715.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     15.00 TO NODE     10.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.822
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
 SUBAREA AREA(ACRES) =   11.50   SUBAREA RUNOFF(CFS) =   15.82
 TOTAL AREA(ACRES) =       28.8   TOTAL RUNOFF(CFS) =      39.61
 TC(MIN.) =   19.59

****************************************************************************
 FLOW PROCESS FROM NODE     10.00 TO NODE      9.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    775.00  DOWNSTREAM(FEET) =    690.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2230.00   CHANNEL SLOPE =  0.0381
 CHANNEL FLOW THRU SUBAREA(CFS) =      39.61
 FLOW VELOCITY(FEET/SEC) =   7.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.26   Tc(MIN.) =   24.85
 LONGEST FLOWPATH FROM NODE     25.00 TO NODE      9.00 =    4945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     10.00 TO NODE      9.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.278
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3716
 SUBAREA AREA(ACRES) =   40.07   SUBAREA RUNOFF(CFS) =   49.92
 TOTAL AREA(ACRES) =       68.9   TOTAL RUNOFF(CFS) =      83.90
 TC(MIN.) =   24.85
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE      5.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    690.00  DOWNSTREAM(FEET) =    676.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1020.00   CHANNEL SLOPE =  0.0137
  CHANNEL FLOW THRU SUBAREA(CFS) =      83.90
  FLOW VELOCITY(FEET/SEC) =   5.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.22   Tc(MIN.) =   28.07
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE      5.00 =    5965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE      5.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.031
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3804
  SUBAREA AREA(ACRES) =   30.65   SUBAREA RUNOFF(CFS) =   37.15
  TOTAL AREA(ACRES) =       99.5   TOTAL RUNOFF(CFS) =     114.71
  TC(MIN.) =   28.07

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.07
  RAINFALL INTENSITY(INCH/HR) =   3.03
  TOTAL STREAM AREA(ACRES) =    99.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    114.71

****************************************************************************
  FLOW PROCESS FROM NODE   4938.00 TO NODE   4936.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
```

```
  UPSTREAM ELEVATION(FEET) =    701.00
  DOWNSTREAM ELEVATION(FEET) =    700.40
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.030
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    56.18
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   4936.00 TO NODE   4934.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  700.40  DOWNSTREAM ELEVATION(FEET) =  689.90
  STREET LENGTH(FEET) =   860.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   12.06
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
  STREET FLOW TRAVEL TIME(MIN.) =   5.23   Tc(MIN.) =    8.26
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.673
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.13      SUBAREA RUNOFF(CFS) =    6.79
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       7.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  3.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.33
  LONGEST FLOWPATH FROM NODE   4938.00 TO NODE   4934.00 =     945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4934.00 TO NODE      5.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   683.90  DOWNSTREAM(FEET) =   676.00
  FLOW LENGTH(FEET) =   740.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.34
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.39
  PIPE TRAVEL TIME(MIN.) =   1.95    Tc(MIN.) =   10.20
  LONGEST FLOWPATH FROM NODE   4938.00 TO NODE      5.00 =    1685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.20
  RAINFALL INTENSITY(INCH/HR) =   5.82
  TOTAL STREAM AREA(ACRES) =     1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.39

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      6.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    689.80
  DOWNSTREAM ELEVATION(FEET) =    688.00
  ELEVATION DIFFERENCE(FEET) =      1.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.535
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.83
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
FLOW PROCESS FROM NODE      6.00 TO NODE      5.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) =  688.00  DOWNSTREAM ELEVATION(FEET) =  680.60
STREET LENGTH(FEET) =   670.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 39.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.37
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.35
  HALFSTREET FLOOD WIDTH(FEET) =   11.10
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.49
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.87
STREET FLOW TRAVEL TIME(MIN.) =   4.48   Tc(MIN.) =    7.01
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.414
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .9000
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
SUBAREA AREA(ACRES) =    0.75      SUBAREA RUNOFF(CFS) =    5.00
TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       5.67

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.77
FLOW VELOCITY(FEET/SEC.) =  2.82   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
LONGEST FLOWPATH FROM NODE      7.00 TO NODE      5.00 =     755.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.01
  RAINFALL INTENSITY(INCH/HR) =   7.41
  TOTAL STREAM AREA(ACRES) =     0.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.67

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      140.34    21.68        3.580         99.54
      2      114.71    28.07        3.031         99.51
      3        7.39    10.20        5.821          1.23
      4        5.67     7.01        7.414          0.85

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  4 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      107.18     7.01       7.414
      2      139.85    10.20       5.821
      3      236.21    21.68       3.580
      4      239.66    28.07       3.031

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     239.66   Tc(MIN.) =   28.07
  TOTAL AREA(ACRES) =      201.1
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE      5.00 =    5965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      1.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   676.00  DOWNSTREAM(FEET) =   674.50
  FLOW LENGTH(FEET) =   135.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  45.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.05
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     239.66
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   28.22
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE      1.00 =    6100.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.22
  RAINFALL INTENSITY(INCH/HR) =   3.02
  TOTAL STREAM AREA(ACRES) =   201.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    239.66

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      3.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =    700.70
  DOWNSTREAM ELEVATION(FEET) =    700.00
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.832
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      2.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  700.00  DOWNSTREAM ELEVATION(FEET) =  680.80
  STREET LENGTH(FEET) =  1675.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.43
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.12
  STREET FLOW TRAVEL TIME(MIN.) =   9.81   Tc(MIN.) =   12.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.069
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.99      SUBAREA RUNOFF(CFS) =    9.08
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       9.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.71
  FLOW VELOCITY(FEET/SEC.) =  3.24   DEPTH*VELOCITY(FT*FT/SEC.) =   1.49
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1675.0 FT WITH ELEVATION-DROP =  19.2 FT, IS   16.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE      2.00
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      2.00 =    1740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      1.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   674.50  DOWNSTREAM(FEET) =   674.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.42
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.44
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   12.77
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      1.00 =    1790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.77
```

```
  RAINFALL INTENSITY(INCH/HR) =   5.04
  TOTAL STREAM AREA(ACRES) =     2.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.44

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      239.66    28.22        3.020        201.13
      2        9.44    12.77        5.036          2.07

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      153.18    12.77       5.036
      2      245.33    28.22       3.020

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     245.33   Tc(MIN.) =   28.22
  TOTAL AREA(ACRES) =      203.2
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE      1.00 =    6100.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      203.2  TC(MIN.) =     28.22
  PEAK FLOW RATE(CFS)   =     245.33
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-2000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	2	3
4998	4996	2	731.2	728.5	110	0.9	0.08				
4996	4994	6	728.5	721.9	820	0.9	1.72				
4994	4988	5	718.5	717	120			VALLEY			
4994	4988	8				0.2	0.20				
4988	4986	3	713.7	713	70						
4986	4986	1						1 OF 2			
4992	4990	2	727.5	727.1	80	0.9	0.09				
4990	4986	6	727.1	723.6	350	0.9	0.67				
4986	4986	1						2 OF 2			
4986	4980	3	713	708	470						
4980	4980	1						1 OF 2			
4985	4984	2	722.6	722.4	80	0.9	0.10				
4984	4983	6	722.4	720	210	0.9	0.31				
4983	4982	5	717.5	717.3	20			VALLEY			
4983	4982	8				0.2	0.10				
4982	4980	3	712.5	708	70						
4980	4980	1						2 OF 2			
4980	4970	3	708	704	400						
4970	4970	1						1 OF 2			
4978	4976	2	725.2	723.5	75	0.9	0.09				
4976	4974	6	723.5	720.5	315	0.9	1.44				
4974	4972	5	717.5	717.3	50			VALLEY			
4974	4972	8				0.3	0.25				
4972	4970	3	717.3	716.7	60						
4970	4970	1						2 OF 2			
4970	4961	3	716.7	708.5	820						
4961	4961	10						SAVE TO BANK 1			
4968	4966	2	723.5	721	80	0.9	0.10				
4966	4964	6	721	715	400	0.9	0.70				
4964	4964	1						1 OF 2			
2030	2029	2	1176	1150	84	0.36	0.07				
2029	2028	5	1150	745	1562			MTN			
2029	2028	8				0.34	13.66				
2028	4964	5	745	713	1840			VALLEY			
2028	4964	8				0.33	41.90				
4964	4964	1						2 OF 2			

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Newland Sierra

Job #: 2660-02

Run Name:
P-2000.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
4964	4961	3	709	708.5	40						
4961	4961	11						ADD BANK 1			
4961	2000	3	708.5	708	50						
							61.48				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 2000                                                         *
 ************************************************************************

  FILE NAME: P-2000.DAT
  TIME/DATE OF STUDY: 15:43 12/08/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   4985.00 TO NODE   4984.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    722.60
  DOWNSTREAM ELEVATION(FEET) =    722.40
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.207
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   4984.00 TO NODE   4983.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  722.40  DOWNSTREAM ELEVATION(FEET) =  720.00
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    8.99
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.53   Tc(MIN.) =    4.74
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.31      SUBAREA RUNOFF(CFS) =    2.57
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.40

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.04
  FLOW VELOCITY(FEET/SEC.) =  2.55   DEPTH*VELOCITY(FT*FT/SEC.) =   0.88
  LONGEST FLOWPATH FROM NODE   4985.00 TO NODE   4983.00 =     290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4983.00 TO NODE   4982.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.50  DOWNSTREAM(FEET) =    717.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =    20.00   CHANNEL SLOPE =  0.0100
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.40
  FLOW VELOCITY(FEET/SEC) =   1.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.17   Tc(MIN.) =    4.91
  LONGEST FLOWPATH FROM NODE   4985.00 TO NODE   4982.00 =     310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4983.00 TO NODE   4982.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7627
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.18
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       3.59
  TC(MIN.) =    4.91

****************************************************************************
  FLOW PROCESS FROM NODE   4982.00 TO NODE   4970.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   712.50  DOWNSTREAM(FEET) =   704.00
  FLOW LENGTH(FEET) =   470.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.43
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.59
  PIPE TRAVEL TIME(MIN.) =   1.22    Tc(MIN.) =    6.13
  LONGEST FLOWPATH FROM NODE   4985.00 TO NODE   4970.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4970.00 TO NODE   4970.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.13
  RAINFALL INTENSITY(INCH/HR) =   8.09
  TOTAL STREAM AREA(ACRES) =     0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.59

****************************************************************************
  FLOW PROCESS FROM NODE   4978.00 TO NODE   4976.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    725.20
  DOWNSTREAM ELEVATION(FEET) =    723.50
  ELEVATION DIFFERENCE(FEET) =      1.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.373
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   4976.00 TO NODE   4974.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  723.50  DOWNSTREAM ELEVATION(FEET) =  720.50
```

```
  STREET LENGTH(FEET) =   315.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.14
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
  STREET FLOW TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =    4.26
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.44      SUBAREA RUNOFF(CFS) =   11.95
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =      12.70

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  20.17
  FLOW VELOCITY(FEET/SEC.) =  3.26   DEPTH*VELOCITY(FT*FT/SEC.) =   1.68
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  315.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   12.0 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   4974.00
  LONGEST FLOWPATH FROM NODE   4978.00 TO NODE   4974.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4974.00 TO NODE   4972.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.50  DOWNSTREAM(FEET) =    717.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0040
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.70
  FLOW VELOCITY(FEET/SEC) =   1.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =    4.75
  LONGEST FLOWPATH FROM NODE   4978.00 TO NODE   4972.00 =     440.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   4974.00 TO NODE   4972.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8157
  SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    0.69
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =      13.39
  TC(MIN.) =    4.75

****************************************************************************
  FLOW PROCESS FROM NODE   4972.00 TO NODE   4970.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   717.30  DOWNSTREAM(FEET) =   716.70
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.39
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    4.89
  LONGEST FLOWPATH FROM NODE   4978.00 TO NODE   4970.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4970.00 TO NODE   4970.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.89
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.59     6.13        8.087          0.51
```

```
     2       13.39     4.89        9.222          1.78

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.25     4.89       9.222
      2       15.33     6.13       8.087

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.25   Tc(MIN.) =    4.89
  TOTAL AREA(ACRES) =        2.3
  LONGEST FLOWPATH FROM NODE   4985.00 TO NODE   4970.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4970.00 TO NODE   4961.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   716.70  DOWNSTREAM(FEET) =   708.50
  FLOW LENGTH(FEET) =   820.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.51
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.25
  PIPE TRAVEL TIME(MIN.) =   1.82    Tc(MIN.) =    6.71
  LONGEST FLOWPATH FROM NODE   4985.00 TO NODE   4961.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4961.00 TO NODE   4961.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   4968.00 TO NODE   4966.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    723.50
  DOWNSTREAM ELEVATION(FEET) =    721.00
```

```
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.202
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   4966.00 TO NODE   4964.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  721.00  DOWNSTREAM ELEVATION(FEET) =  715.00
  STREET LENGTH(FEET) =   400.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.73
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.99
  STREET FLOW TRAVEL TIME(MIN.) =   2.30   Tc(MIN.) =    4.51
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    5.81
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       6.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.77
  FLOW VELOCITY(FEET/SEC.) =  3.30   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
  LONGEST FLOWPATH FROM NODE   4968.00 TO NODE   4964.00 =     480.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   4964.00 TO NODE   4964.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    4.51
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     0.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.64

****************************************************************************
 FLOW PROCESS FROM NODE   2030.00 TO NODE   2029.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3600
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    84.00
 UPSTREAM ELEVATION(FEET) =   1176.00
 DOWNSTREAM ELEVATION(FEET) =   1150.00
 ELEVATION DIFFERENCE(FEET) =     26.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.667
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.506
 SUBAREA RUNOFF(CFS) =      0.21
 TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
 FLOW PROCESS FROM NODE   2029.00 TO NODE   2028.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    745.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1562.00   CHANNEL SLOPE =  0.2593
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1831 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.21
 FLOW VELOCITY(FEET/SEC) =   2.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  10.86   Tc(MIN.) =   16.53
 LONGEST FLOWPATH FROM NODE   2030.00 TO NODE   2028.00 =    1646.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2029.00 TO NODE   2028.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.264
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3401
  SUBAREA AREA(ACRES) =   13.66   SUBAREA RUNOFF(CFS) =   19.80
  TOTAL AREA(ACRES) =       13.7   TOTAL RUNOFF(CFS) =      19.91
  TC(MIN.) =   16.53

****************************************************************************
  FLOW PROCESS FROM NODE   2028.00 TO NODE   4964.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    745.00  DOWNSTREAM(FEET) =    713.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1840.00   CHANNEL SLOPE =  0.0174
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.91
  FLOW VELOCITY(FEET/SEC) =   3.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.77   Tc(MIN.) =   24.30
  LONGEST FLOWPATH FROM NODE   2030.00 TO NODE   4964.00 =    3486.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2028.00 TO NODE   4964.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.326
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3325
  SUBAREA AREA(ACRES) =   41.90   SUBAREA RUNOFF(CFS) =   45.99
  TOTAL AREA(ACRES) =       55.6   TOTAL RUNOFF(CFS) =      61.52
  TC(MIN.) =   24.30

****************************************************************************
  FLOW PROCESS FROM NODE   4964.00 TO NODE   4964.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.30
  RAINFALL INTENSITY(INCH/HR) =   3.33
```

```
  TOTAL STREAM AREA(ACRES) =    55.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     61.52

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.64     4.51        9.222          0.80
      2       61.52    24.30        3.326         55.63

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       18.05     4.51       9.222
      2       63.91    24.30       3.326

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      63.91   Tc(MIN.) =   24.30
  TOTAL AREA(ACRES) =       56.4
  LONGEST FLOWPATH FROM NODE   2030.00 TO NODE   4964.00 =    3486.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4964.00 TO NODE   4961.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   709.00  DOWNSTREAM(FEET) =   708.50
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.33
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      63.91
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   24.36
  LONGEST FLOWPATH FROM NODE   2030.00 TO NODE   4961.00 =    3526.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4961.00 TO NODE   4961.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       63.91    24.36       3.321       56.43
```

```
  LONGEST FLOWPATH FROM NODE   2030.00 TO NODE   4961.00 =    3526.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       16.25     6.71       7.626        2.29
  LONGEST FLOWPATH FROM NODE   4985.00 TO NODE   4961.00 =    1600.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      33.87       6.71        7.626
      2      70.99      24.36        3.321

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      70.99   Tc(MIN.) =   24.36
  TOTAL AREA(ACRES) =       58.7

****************************************************************************
  FLOW PROCESS FROM NODE   4961.00 TO NODE   2000.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   708.50  DOWNSTREAM(FEET) =   708.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.70
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      70.99
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   24.44
  LONGEST FLOWPATH FROM NODE   2030.00 TO NODE   2000.00 =    3576.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       58.7  TC(MIN.) =     24.44
  PEAK FLOW RATE(CFS)   =      70.99
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-4000.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
4932	4930	2	723.1	722.2	85	0.9	0.10				
4930	4000	6	722.2	718.8	190	0.9	0.25				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 4000                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-4000.DAT
  TIME/DATE OF STUDY: 14:26 12/09/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   4932.00 TO NODE   4930.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    723.10
  DOWNSTREAM ELEVATION(FEET) =    722.20
  ELEVATION DIFFERENCE(FEET) =      0.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.867
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.88
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.07
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      2.07

****************************************************************************
  FLOW PROCESS FROM NODE   4930.00 TO NODE   4000.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  722.20  DOWNSTREAM ELEVATION(FEET) =  718.80
  STREET LENGTH(FEET) =   190.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.94
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.07   Tc(MIN.) =    3.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.25      SUBAREA RUNOFF(CFS) =    2.07
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       4.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  10.97
  FLOW VELOCITY(FEET/SEC.) =  3.14   DEPTH*VELOCITY(FT*FT/SEC.) =   1.09
  LONGEST FLOWPATH FROM NODE   4932.00 TO NODE   4000.00 =     275.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.5  TC(MIN.) =      3.94
  PEAK FLOW RATE(CFS)   =       4.15
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-5000.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
4928	4926	2	718.8	717	85	0.9	0.10				
4926	5000	6	717	711	955	0.9	1.42				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
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              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUB-BASIN 5000                                                         *
*                                                                        *
 ************************************************************************

  FILE NAME: P-5000.DAT
  TIME/DATE OF STUDY: 14:27 12/09/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   4928.00 TO NODE   4926.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    718.80
  DOWNSTREAM ELEVATION(FEET) =    717.00
  ELEVATION DIFFERENCE(FEET) =      1.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.535
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   4926.00 TO NODE   5000.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  717.00  DOWNSTREAM ELEVATION(FEET) =  711.00
  STREET LENGTH(FEET) =   955.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.80
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   7.25   Tc(MIN.) =    9.78
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.981
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    1.42      SUBAREA RUNOFF(CFS) =    7.64
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       8.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.80
  FLOW VELOCITY(FEET/SEC.) =  2.49   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  955.0 FT WITH ELEVATION-DROP =   6.0 FT, IS   11.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   5000.00
  LONGEST FLOWPATH FROM NODE   4928.00 TO NODE   5000.00 =    1040.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.5  TC(MIN.) =      9.78
  PEAK FLOW RATE(CFS)   =       8.18
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

FUSCOE
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Newland Sierra

Job #: 2660-02

Run Name:
P-6000.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
1110	1100	2	1128.5	1123	57	0.36	0.44				
1100	1015	5	1123	715	3490			MTN			
1100	1015	8				0.34	50.24				
1015	1015	10						SAVE TO BANK 1			
1090	1080	2	1246	1232	100	0.36	0.23				
1080	1050	5	1232	880	1411			MTN			
1080	1050	8				0.36	20.39				
1050	1050	1						1 OF 2			
1070	1060	2	1145	1137	85	0.36	0.29				
1060	1050	5	1137	880	909			MTN			
1060	1050	8				0.36	6.46				
1050	1050	1						2 OF 2			
1050	1020	5	880	763	1286			MTN			
1050	1020	8				0.36	13.54				
1020	1020	1						1 OF 2			
1040	1030	2	781	775	66	0.48	0.60				
1030	1020	5	775	763	269			VALLEY			
1030	1020	8				0.45	2.06				
1020	1020	1						2 OF 2			
1020	1015	5	763	715	1236			VALLEY			
1020	1015	8				0.35	13.75				
1015	1015	11						ADD BANK 1			
1015	1015	12						CLEAR BANK 1			
1015	4942	5	715	698	936			MTN			
1015	4942	8				0.32	22.83				
4942	4942	1						1 OF 4			
4958	4956	2	714	713.3	80	0.9	0.10				
4956	4954	6	713.3	710	475	0.9	0.75				
4954	4942	3	704	695	590						
4942	4942	1						2 OF 4			
4948	4946	2	710	708	80	0.9	0.09				
4946	4944	6	708	701	520	0.9	0.72				
4944	4942	3	696	695	80						
4942	4942	1						3 OF 4			
4952	4950	2	710	708.5	85	0.9	0.10				

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Newland Sierra

Job #: 2660-02

Run Name:
P-6000.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
4950	4942	6	708.5	701	520	0.9	0.81				
4942	4942	1						4 OF 4			
4942	6000	3	695	694	125						
							133.40				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* NO DETENTION                                                           *
* SUB-BASIN 6000                                                         *
 ************************************************************************

  FILE NAME: P-49-4.DAT
  TIME/DATE OF STUDY: 15:41 12/08/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   39.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1110.00 TO NODE   1100.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    57.00
  UPSTREAM ELEVATION(FEET) =   1128.50
  DOWNSTREAM ELEVATION(FEET) =   1123.00
  ELEVATION DIFFERENCE(FEET) =      5.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.724
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.46
  TOTAL AREA(ACRES) =      0.44   TOTAL RUNOFF(CFS) =      1.46

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1015.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1123.00  DOWNSTREAM(FEET) =    715.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3490.00   CHANNEL SLOPE =  0.1169
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1127 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.46
  FLOW VELOCITY(FEET/SEC) =   2.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  27.28   Tc(MIN.) =   32.00
  LONGEST FLOWPATH FROM NODE   1110.00 TO NODE   1015.00 =    3547.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1015.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.785
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3402
  SUBAREA AREA(ACRES) =   50.24   SUBAREA RUNOFF(CFS) =   47.57
  TOTAL AREA(ACRES) =       50.7   TOTAL RUNOFF(CFS) =      48.01
  TC(MIN.) =   32.00
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1090.00 TO NODE   1080.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1246.00
  DOWNSTREAM ELEVATION(FEET) =   1232.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.183
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.041
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
  FLOW PROCESS FROM NODE   1080.00 TO NODE   1050.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1232.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1411.00   CHANNEL SLOPE =  0.2495
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1798 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.67
  FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   9.90   Tc(MIN.) =   16.09
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   1050.00 =    1511.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1080.00 TO NODE   1050.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.340
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
  SUBAREA AREA(ACRES) =   20.39   SUBAREA RUNOFF(CFS) =   31.86
  TOTAL AREA(ACRES) =       20.6   TOTAL RUNOFF(CFS) =      32.22
  TC(MIN.) =   16.09

****************************************************************************
  FLOW PROCESS FROM NODE   1050.00 TO NODE   1050.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.09
  RAINFALL INTENSITY(INCH/HR) =   4.34
  TOTAL STREAM AREA(ACRES) =    20.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.22

****************************************************************************
  FLOW PROCESS FROM NODE   1070.00 TO NODE   1060.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1145.00
  DOWNSTREAM ELEVATION(FEET) =   1137.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.817
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.364
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.87

****************************************************************************
  FLOW PROCESS FROM NODE   1060.00 TO NODE   1050.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1137.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   909.00   CHANNEL SLOPE =  0.2827
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1907 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.87
  FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  TRAVEL TIME(MIN.) =   6.20   Tc(MIN.) =   12.01
  LONGEST FLOWPATH FROM NODE   1070.00 TO NODE   1050.00 =     994.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1060.00 TO NODE   1050.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.239
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
  SUBAREA AREA(ACRES) =    6.46   SUBAREA RUNOFF(CFS) =   12.18
  TOTAL AREA(ACRES) =        6.8   TOTAL RUNOFF(CFS) =      12.73
  TC(MIN.) =   12.01

****************************************************************************
  FLOW PROCESS FROM NODE   1050.00 TO NODE   1050.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.01
  RAINFALL INTENSITY(INCH/HR) =   5.24
  TOTAL STREAM AREA(ACRES) =     6.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.73

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       32.22    16.09        4.340         20.62
      2       12.73    12.01        5.239          6.75

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       36.79    12.01       5.239
      2       42.76    16.09       4.340

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.76   Tc(MIN.) =   16.09
  TOTAL AREA(ACRES) =       27.4
```

```
 LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   1050.00 =    1511.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1050.00 TO NODE   1020.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    880.00  DOWNSTREAM(FEET) =    763.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1286.00   CHANNEL SLOPE =  0.0910
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0910 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      42.76
 FLOW VELOCITY(FEET/SEC) =   5.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.63   Tc(MIN.) =   19.72
 LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   1020.00 =    2797.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1050.00 TO NODE   1020.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.806
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3600
 SUBAREA AREA(ACRES) =   13.54   SUBAREA RUNOFF(CFS) =   18.55
 TOTAL AREA(ACRES) =       40.9   TOTAL RUNOFF(CFS) =      56.05
 TC(MIN.) =   19.72

****************************************************************************
 FLOW PROCESS FROM NODE   1020.00 TO NODE   1020.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   19.72
 RAINFALL INTENSITY(INCH/HR) =   3.81
 TOTAL STREAM AREA(ACRES) =    40.91
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     56.05

****************************************************************************
 FLOW PROCESS FROM NODE   1040.00 TO NODE   1030.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    66.00
  UPSTREAM ELEVATION(FEET) =    781.00
  DOWNSTREAM ELEVATION(FEET) =    775.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.344
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.66
  TOTAL AREA(ACRES) =      0.60   TOTAL RUNOFF(CFS) =      2.66

****************************************************************************
  FLOW PROCESS FROM NODE   1030.00 TO NODE   1020.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    775.00  DOWNSTREAM(FEET) =    763.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   269.00   CHANNEL SLOPE =  0.0446
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.66
  FLOW VELOCITY(FEET/SEC) =   3.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =    5.51
  LONGEST FLOWPATH FROM NODE   1040.00 TO NODE   1020.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1030.00 TO NODE   1020.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.666
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4568
  SUBAREA AREA(ACRES) =    2.06   SUBAREA RUNOFF(CFS) =    8.03
  TOTAL AREA(ACRES) =        2.7   TOTAL RUNOFF(CFS) =      10.53
  TC(MIN.) =    5.51

****************************************************************************
  FLOW PROCESS FROM NODE   1020.00 TO NODE   1020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    5.51
  RAINFALL INTENSITY(INCH/HR) =   8.67
  TOTAL STREAM AREA(ACRES) =     2.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.53

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       56.05    19.72        3.806         40.91
      2       10.53     5.51        8.666          2.66

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       35.14     5.51       8.666
      2       60.67    19.72       3.806

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      60.67   Tc(MIN.) =   19.72
  TOTAL AREA(ACRES) =       43.6
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   1020.00 =    2797.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1020.00 TO NODE   1015.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    763.00  DOWNSTREAM(FEET) =    715.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1236.00   CHANNEL SLOPE =  0.0388
  CHANNEL FLOW THRU SUBAREA(CFS) =      60.67
  FLOW VELOCITY(FEET/SEC) =   8.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.55   Tc(MIN.) =   22.27
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   1015.00 =    4033.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1020.00 TO NODE   1015.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.518
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3621
```

```
  SUBAREA AREA(ACRES) =   13.75   SUBAREA RUNOFF(CFS) =   16.93
  TOTAL AREA(ACRES) =       57.3   TOTAL RUNOFF(CFS) =      73.02
  TC(MIN.) =   22.27

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       73.02    22.27       3.518       57.32
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   1015.00 =    4033.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       48.01    32.00       2.785       50.68
  LONGEST FLOWPATH FROM NODE   1110.00 TO NODE   1015.00 =    3547.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     106.44      22.27        3.518
      2     105.82      32.00        2.785

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     106.44   Tc(MIN.) =   22.27
  TOTAL AREA(ACRES) =      108.0

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   1015.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   4942.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    715.00  DOWNSTREAM(FEET) =    698.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   936.00   CHANNEL SLOPE =  0.0182
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0182 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =     106.44
  FLOW VELOCITY(FEET/SEC) =   3.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.37   Tc(MIN.) =   26.64
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   4942.00 =    4969.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1015.00 TO NODE   4942.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.134
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3463
  SUBAREA AREA(ACRES) =   22.83   SUBAREA RUNOFF(CFS) =   22.90
  TOTAL AREA(ACRES) =      130.8   TOTAL RUNOFF(CFS) =     141.99
  TC(MIN.) =   26.64

****************************************************************************
  FLOW PROCESS FROM NODE   4942.00 TO NODE   4942.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.64
  RAINFALL INTENSITY(INCH/HR) =   3.13
  TOTAL STREAM AREA(ACRES) =   130.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    141.99

****************************************************************************
  FLOW PROCESS FROM NODE   4958.00 TO NODE   4956.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    714.00
  DOWNSTREAM ELEVATION(FEET) =    713.30
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.946
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    61.25
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.83
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
 FLOW PROCESS FROM NODE   4956.00 TO NODE   4954.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  713.30  DOWNSTREAM ELEVATION(FEET) =  710.00
 STREET LENGTH(FEET) =   475.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 39.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.44
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.37
   HALFSTREET FLOOD WIDTH(FEET) =   12.33
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
 STREET FLOW TRAVEL TIME(MIN.) =   3.78   Tc(MIN.) =    6.72
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.618
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 SUBAREA AREA(ACRES) =    0.75      SUBAREA RUNOFF(CFS) =    5.14
 TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       5.83

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.27
 FLOW VELOCITY(FEET/SEC.) =  2.38   DEPTH*VELOCITY(FT*FT/SEC.) =   1.03
 LONGEST FLOWPATH FROM NODE   4958.00 TO NODE   4954.00 =     555.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   4954.00 TO NODE   4942.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   704.00  DOWNSTREAM(FEET) =   695.00
  FLOW LENGTH(FEET) =   590.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.87
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.83
  PIPE TRAVEL TIME(MIN.) =   1.43    Tc(MIN.) =    8.15
  LONGEST FLOWPATH FROM NODE   4958.00 TO NODE   4942.00 =    1145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4942.00 TO NODE   4942.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.15
  RAINFALL INTENSITY(INCH/HR) =   6.73
  TOTAL STREAM AREA(ACRES) =     0.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.83

****************************************************************************
  FLOW PROCESS FROM NODE   4948.00 TO NODE   4946.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    710.00
  DOWNSTREAM ELEVATION(FEET) =    708.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.373
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   4946.00 TO NODE   4944.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
```

```
 UPSTREAM ELEVATION(FEET) =  708.00  DOWNSTREAM ELEVATION(FEET) =  701.00
 STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 39.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.55
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   10.90
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.72
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.94
 STREET FLOW TRAVEL TIME(MIN.) =   3.19   Tc(MIN.) =    5.56
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.614
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 SUBAREA AREA(ACRES) =    0.72      SUBAREA RUNOFF(CFS) =    5.58
 TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       6.28

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.77
 FLOW VELOCITY(FEET/SEC.) =  3.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.25
 LONGEST FLOWPATH FROM NODE   4948.00 TO NODE   4944.00 =     600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   4944.00 TO NODE   4942.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   696.00  DOWNSTREAM(FEET) =   695.00
 FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.49
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.28
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    5.76
 LONGEST FLOWPATH FROM NODE   4948.00 TO NODE   4942.00 =     680.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   4942.00 TO NODE   4942.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.76
  RAINFALL INTENSITY(INCH/HR) =   8.41
  TOTAL STREAM AREA(ACRES) =     0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.28

****************************************************************************
  FLOW PROCESS FROM NODE   4952.00 TO NODE   4950.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    710.00
  DOWNSTREAM ELEVATION(FEET) =    708.50
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.605
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    76.47
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   4950.00 TO NODE   4942.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  708.50  DOWNSTREAM ELEVATION(FEET) =  701.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 39.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.24
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
  STREET FLOW TRAVEL TIME(MIN.) =   3.03   Tc(MIN.) =    5.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.541
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.81      SUBAREA RUNOFF(CFS) =    6.23
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       6.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.18
  FLOW VELOCITY(FEET/SEC.) =  3.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.35
  LONGEST FLOWPATH FROM NODE   4952.00 TO NODE   4942.00 =     605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4942.00 TO NODE   4942.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.63
  RAINFALL INTENSITY(INCH/HR) =   8.54
  TOTAL STREAM AREA(ACRES) =     0.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.99

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      141.99    26.64        3.134        130.83
      2        5.83     8.15        6.726          0.85
      3        6.28     5.76        8.414          0.81
      4        6.99     5.63        8.541          0.91

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  4 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       47.17     5.63       8.541
      2       48.01     5.76       8.414
      3       59.82     8.15       6.726
      4      149.61    26.64       3.134

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     149.61   Tc(MIN.) =   26.64
  TOTAL AREA(ACRES) =      133.4
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   4942.00 =    4969.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4942.00 TO NODE   6000.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   695.00  DOWNSTREAM(FEET) =   694.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  39.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.87
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     149.61
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   26.82
  LONGEST FLOWPATH FROM NODE   1090.00 TO NODE   6000.00 =    5094.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      133.4  TC(MIN.) =     26.82
  PEAK FLOW RATE(CFS)   =     149.61
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Proposed Condition

BASIN C

FUSCOE
ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

Newland Sierra

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2695	2694	2	1454	1452.5	75	0.52	0.14				
2694	2693	6	1452.5	1447	250	0.52	0.46	One side			
2693	2692	3	1441	1440	75						
2692	2692	1						1 of 2			
2691	2690	2	1464	1461	95	0.52	0.23				
2690	2692	6	1461	1448	500	0.52	3.63	One side			
2692	2692	1						2 of 2			
2692	2689	3	1434	1433.6	30						
2689	2689	1						1 of 2			
2696	2695.5	2	1464	1461	80	0.35	0.43				
2695.5	2689	3	1458	1433.6	600						
2689	2689	1						2 of 2			
2689	2688	3	1433.6	1363	975						
2688	2688	1						1 of 2			
2699	2698	2	1605	1590	85	0.35	0.23				
2698	2697	5	1590	1494	475						
2698	2697	8				0.35	1.66				
2697	2690	5	1494	1375	515						
2697	2690	8				0.35	6.14				
2690	2688	3	1369	1363	50						
2688	2688	1						2 of 2			
2688	2681	3	1363	1362	50						
2681	2681	10						Save to bank 1			
2687	2686	2	1411	1409	80	0.45	0.20				
2686	2685.5	6	1409	1390	415	0.52	2.96	One side			
2685.5	2685	3	1384	1380	60						
2685	2682	5	1380	1379	85	0.35	0.25				
2682	2682	1						1 of 2			
2684	2683	2	1467	1423	100	0.35	0.45				
2683	2682	3	1417	1373	110						
2682	2682	1						2 of 2			
2682	2681	3	1373	1362	415						
2681	2681	11						Add bank 1			
2681	2681	12						Clear bank 1			

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Newland Sierra

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2681	2676	3	1362	1359	80						
2676	2676	1						1 of 2			
2680	2679	2	1447	1443	75	0.52	0.13				
2679	2678	6	1443	1369.5	730	0.52	1.38	One side			
2678	2677	3	1365	1364	40						
2677	2676	3	1364	1359	50						
2676	2676	1						2 of 2			
2676	2672	3	1359	1323	320						
2672	2672	1						1 of 2			
2675	2674	2	1427	1420	75	0.35	0.05				
2674	2673	5	1420	1330	440						
2674	2673	8				0.35	2.36				
2673	2672	3	1324	1323	20						
2672	2672	1						2 of 2			
2672	2651	3	1323	1309	250						
2651	2651	10						Save to bank 1			
2671	2670	2	1445	1420	100	0.25	0.27				
2670	2669	5	1420	1385	280						
2670	2669	8				0.29	4.07				
2669	2668	3	1379	1375	415						
2668	2663	5	1375	1348	600						
2663	2663	1						1 of 3			
2667	2666	2	1420	1405	100	0.35	0.19				
2666	2663	5	1405	1348	680						
2666	2663	8				0.35	2.98				
2663	2663	1						2 of 3			
2665.5	2665	2	1363	1361	80	0.45	0.25				
2665	2664	6	1361	1350	550	0.46	4.22	Two sides			
2664	2663	3	1344	1342	110						
2663	2663	1						3 of 3			
2663	2657	3	1342	1312	372						
2657	2657	1						1 of 2			
2662	2661	2	1400	1399	66.67	0.45	0.16				
2661	2660	6	1399	1355	935	0.45	3.60	One side			
2660	2659	3	1349	1348.4	60						

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Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2659	2658	5	1348.4	1347.6	80	0.25	0.17				
2658	2657	3	1342	1313	540						
2657	2657	1						2 of 2			
2657	2650.6	3	1312	1308	100						
2650.6	2650.6	1						1 of 2			
2650.9	2650.8	2	1356	1354	80	0.45	0.10				
2650.8	2650.7	6	1354	1315	690	0.45	3.79	One side			
2650.7	2650.6	3	1309	1308	75						
2650.6	2650.6	1						2 of 2			
2650.6	2650	3	1308	1298.2	500						
2650	2650	10						Save to bank 2			
2656	2655	2	1390	1389.5	55	0.52	0.15				
2655	2654	6	1389.5	1315	970	0.52	1.50	One side			
2654	2653	3	1309	1305	50						
2653	2652	5	1305	1304.7	30		3.18				
2652	2651	3	1299	1298.5	40						
2651	2651	11						Add bank 1			
2651	2651	12						Clear bank 1			
2651	2650	3	1298.5	1298.2	30						
2650	2650	11						Add bank 2			
2650	2650	12						Clear bank 2			
2650	2635	3	1298.2	1292.5	160						
2635	2635	10						Save to bank 1			
2649	2648	2	1400	1398	80	0.45	0.25				
2648	2647	6	1398	1380	720	0.47	5.78	One side			
2647	2643	3	1374	1361	300						
2643	2643	1						1 of 2			
2646	2645	2	1395	1393	80	0.45	0.08				
2645	2644	6	1393	1368	730	0.45	4.06	Two sides			
2644	2643	3	1362	1361	50						
2643	2643	1						2 of 2			
2643	2640	3	1361	1356	200						
2640	2640	1						1 of 2			
2642	2641	2	1378	1376	81.58	0.45	0.22				
2641	2640	6	1376	1362	610	0.47	5.99	Two sides			

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Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2640	2640	1						2 of 2			
2640	2639	3	1362	1342	210						
2639	2638	3	1342	1314	380						
2638	2637	3	1314	1295	380						
2637	2636	5	1295	1293	200	0.52	1.02				
2636	2635	3	1293	1292.5	20						
2635	2635	11						Add bank 1			
2635	2635	12						Clear bank 1			
2635	2631	3	1292.5	1278.5	195						
2631	2631	1						1 of 2			
2634	2633	2	1435	1405	50	0.35	0.07				
2633	2632	5	1405	1285	540	0.35	4.39				
2632	2631	3	1279	1278.5	50						
2631	2631	1						2 of 2			
2631	2627	3	1278.5	1253	600						
2627	2627	1						1 of 2			
2630	2629	2	1390	1352	100	0.25	0.18				
2629	2628	5	1352	1262	1370	0.25	4.60				
2628	2627	3	1256	1253	125						
2627	2627	1						2 of 2			
2627	2623	3	1253	1197	1335						
2623	2623	1						1 of 2			
2626	2625	2	1330	1280	80	0.25	0.19				
2625	2624	5	1280	1207	440	0.25	4.59				
2624	2623	3	1201	1197	125						
2623	2623	1						2 of 2			
2623	287	3	1196	1185.5	130						
287	287	10						Save to bank 1			
2622	2621	2	1435	1395	100	0.35	0.27				
2621	2620	5	1395	1275	645						
2621	2620	8				0.35	3.37				
2620	2616	3	1261	1231	380						
2616	2616	1						1 of 2			
2619	2618	2	1249	1247.7	65	0.45	0.17				

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Newland Sierra

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2618	2617	5	1247.7	1239	420	0.45	3.59				
2617	2616	3	1236	1231	415						
2616	2616	1						2 of 2			
2616	2616.8	3	1231	1223	540						
2616.8	2616.8	10						Save to Bank 2			
2611	2610	2	1292	1290	80	0.52	0.12				
2610	2609	6	1290	1265	435	0.48	1.90	One side			
2609	2606.2	3	1259	1241	275						
2606.2	2606.2	1						1 of 2			
2606.6	2606.4	2	1267	1265	80	0.45	0.13				
2606.4	2606.2	6	1265	1248	215	0.45	0.92	One side			
2606.2	2606.2	1						2 of 2			
2606.2	2606	3	1242	1232	170						
2606	2606	1						1 of 2			
2608	2607	2	1254	1252	80	0.45	0.12				
2607	2606	6	1252	1238	170	0.45	0.63	One side			
2606	2606	1						2 of 2			
2606	2602	3	1232	1226	150						
2602	2602	1						1 of 2			
2605	2604	2	1244	1242	80	0.45	0.12				
2604	2602	6	1242	1226	495	0.45	2.00	One side			
2602	2602	1						2 of 2			
2602	298	5	1226	1222	130	0.45	0.22				
298	2616.8	3	1216	1214	160						
2616.8	2616.8	11						Add Bank 2			
2616.8	2616.8	12						Clear Bank 2			
2616.8	2612	3	1214	1212	130						
2612	2612	1						1 of 2			
2615	2614	2	1275	1230	100	0.25	0.22				
2614	2613	5	1230	1219	260						
2614	2613	8				0.25	0.67				
2613	2612	3	1213	1212	50						
2612	2612	1						2 of 2			

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Newland Sierra

Date: 7/9/14

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2612	292	3	1212	1196	515						
292	292	10						Save to bank 2			
297	296	2	1236	1234	80	0.45	0.15				
296	295	6	1236	1215	475	0.45	2.67	One side			
295	294	3	1209	1206	125						
294	294	10						Save to Bank 3			
294.9	294.8	2	1245	1243	80.00	0.45	0.14				
294.8	294.7	6	1243	1238	270	0.45	1.09	Two sides			
294.7	294.1	3	1236	1223	605						
294.1	294.1	1						1 of 2			
294.6	294.5	2	1236	1234	80	0.45	0.10				
294.5	294.4	6	1234	1233	100	0.45	0.89	2 sides			
294.4	294.1	3	1227	1223	350						
294.1	294.1	1						2 of 2			
294.1	294	3	1223	1204	750						
294	294	11						add bank 3			
294	294	12						clear bank 3			
294	293.5	3	1204	1200	150						
293.5	293	5	1200	1199	100	0.45	0.21				
293	292	3	1199	1196	50						
292	292	11						add bank 2			
292	292	12						clear bank 2			
292	288	3	1196	1189	270						
288	288	1						1 of 2			
291	290	2	1300	1270	100	0.25	0.20				
290	289	5	1270	1195	840						
290	289	8				0.25	2.84				
289	288	3	1189	1187	170						
288	288	1						2 of 2			
288	287	3	1187	1185.5	275						
287	287	11						add bank 1			
287	287	12						clear bank 1			
287	246	3	1185.5	1178	480						
246	246	7	Tc=16.15 A=99.5 Q=138.38					Allow Q10 to pass, divert higher Q			
246	246	10						save to bank 1			

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Newland Sierra

Date:

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
286	285	2	1218	1216	80	0.45	0.13				
285	284	6	1216	1203	380	0.45	2.74	one side			
284	259	3	1197	1195	180						
259	259	10						save to bank 2			
283	282	2	1268	1266	80	0.46	0.23				
282	281	6	1266	1262	220	0.45	2.06	2 sides			
281	280.6	3	1256	1241	270						
280.6	280.6	1						1 of 2			
280.9	280.8	2	1269	1266	80	0.45	0.16				
280.8	280.7	6	1266	1248	300	0.45	0.56	1 side			
280.7	280.6	3	1242	1241	40						
280.6	280.6	1						2 of 2			
280.6	277	3	1241	1238	70						
277	277	1						1 of 2			
280	279	2	1257	1255	80	0.45	0.24				
279	278	6	1255	1244	340	0.45	2.58	2 sides			
278	277	3	1239	1238	50						
277	277	1						2 of 2			
277	275	3	1238	1228	180						
275	275	1						1 of 2			
275.3	275.2	2	1247	1243	80	0.45	0.14				
275.2	275.1	6	1243	1235	165	0.45	0.29	1 side			
275.1	275	3	1229	1228	40						
275	275	1						2 of 2			
275	293.2	3	1228	1218	330						
293.2	293.2	1						1 of 2			
293.8	293.6	2	1236	1234	80	0.45	0.11				
293.6	293.4	6	1234	1224	390	0.45	1.90	1 side			
293.4	293.2	3	1219	1218	40						
293.2	293.2	1						2 of 2			
293.2	264	3	1218	1216	45						
264	264	10						save to bank 3			
272	271	2	1246	1244	80	0.45	0.07				
271	270	6	1244	1233	850	0.45	2.74	2 sides			

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Date:

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
270	265	3	1227	1217	560						
265	265	1						1 of 2			
269	268	2	1235	1233	80	0.45	0.11				
268	265	6	1233	1222	520	0.45	2.51	2 sides			
265	265	1						2 of 2			
265	264	3	1217	1216	70						
264	264	11						add bank 3			
264	264	12						clear bank 3			
264	260.4	3	1216	1201	515						
260.4	260.4	1						1 of 2			
260.7	260.6	2	1230	1228	80	0.45	0.08				
260.6	260.5	6	1228	1207	740	0.45	3.29				
260.5	260.4	3	1202	1201	20						
260.4	260.4	1						2 of 2			
260.4	260	3	1201	1186	512						
260	260	1						1 of 2			
260.3	260.2	2	1209	1207	80	0.45	0.13				
260.2	260.1	6	1207	1192	510	0.45	1.91				
260.1	260	3	1188	1187.5	25						
260	260	1						2 of 2			
260	259	3	1187.5	1186	140						
259	259	11						add bank 2			
259	259	12						clear bank 2			
259	258	3	1186	1184	160						
258	246	5	1184	1172	300	0.25	1.93				
246	246	10						save "dirty" to bank 2			
257	256	2	1205	1203	80	0.45	0.17				
256	255	6	1203	1185	670	0.45	4.27	one side			
255	248	3	1179	1175	355						
248	248	1						1 of 3			
254	253	2	1188	1186	80	0.45	0.12				
253	248	6	1186	1181	330	0.45	2.82	one side			
248	248	1						2 of 3			

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Date:

Job #: 2660-02

Run Name:
P-26d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
251	250	2	1203	1201	80	0.45	0.09				
250	248	6	1201	1181	890	0.45	7.17	one side			
248	248	1						3 of 3			
248	246	3	1175	1172	150						
246	246	11						add "dirty" bank 2			
246	246	7	Q=8.1 Tc=12.55 A=38.5					Post detention Q			
246	246	11						add "clean" bank 1			
246	245.5	3	1175	1170	450						
245.5	245	3	1170	1098	170						
245	26	5	1098	970	1180						
245	26	8				0.25	39.89				
							177.93				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                     *
* WITH DETENTION AT NODE 246                                             *
* NOTE: "CLEAN" LINE ALLOWS Q10 TO PASS THROUGH. LARGER AMOUNTS DETAINED *
 ************************************************************************

  FILE NAME: P-26D.DAT
  TIME/DATE OF STUDY: 14:33 01/26/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    2.00 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2695.00 TO NODE   2694.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1454.00
  DOWNSTREAM ELEVATION(FEET) =   1452.50
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.176
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.304
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   2694.00 TO NODE   2693.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1452.50  DOWNSTREAM ELEVATION(FEET) = 1447.00
  STREET LENGTH(FEET) =   250.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.63
  STREET FLOW TRAVEL TIME(MIN.) =   1.54   Tc(MIN.) =    8.72
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.444
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    0.46      SUBAREA RUNOFF(CFS) =    1.54
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   7.34
  FLOW VELOCITY(FEET/SEC.) =  2.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.77
  LONGEST FLOWPATH FROM NODE   2695.00 TO NODE   2693.00 =     325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2693.00 TO NODE   2692.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1441.00  DOWNSTREAM(FEET) =  1440.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.90
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    8.97
  LONGEST FLOWPATH FROM NODE   2695.00 TO NODE   2692.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2692.00 TO NODE   2692.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.97
  RAINFALL INTENSITY(INCH/HR) =   6.32
  TOTAL STREAM AREA(ACRES) =     0.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.01

****************************************************************************
  FLOW PROCESS FROM NODE   2691.00 TO NODE   2690.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1464.00
  DOWNSTREAM ELEVATION(FEET) =   1461.00
```

```
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.936
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.467
  SUBAREA RUNOFF(CFS) =      0.89
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
  FLOW PROCESS FROM NODE   2690.00 TO NODE   2692.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1461.00  DOWNSTREAM ELEVATION(FEET) = 1448.00
  STREET LENGTH(FEET) =   500.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.90
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   12.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.50
  STREET FLOW TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =    8.96
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.332
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    3.63      SUBAREA RUNOFF(CFS) =   11.95
  TOTAL AREA(ACRES) =        3.9        PEAK FLOW RATE(CFS) =      12.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.84
  FLOW VELOCITY(FEET/SEC.) =  4.78   DEPTH*VELOCITY(FT*FT/SEC.) =   2.07
  LONGEST FLOWPATH FROM NODE   2691.00 TO NODE   2692.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2692.00 TO NODE   2692.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.96
  RAINFALL INTENSITY(INCH/HR) =   6.33
  TOTAL STREAM AREA(ACRES) =     3.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.71

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.01     8.97        6.325          0.60
      2       12.71     8.96        6.332          3.86

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       14.72     8.96       6.332
      2       14.71     8.97       6.325

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      14.72   Tc(MIN.) =    8.96
  TOTAL AREA(ACRES) =        4.5
  LONGEST FLOWPATH FROM NODE   2691.00 TO NODE   2692.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2692.00 TO NODE   2689.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1434.00  DOWNSTREAM(FEET) =  1433.60
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.10
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.72
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.02
  LONGEST FLOWPATH FROM NODE   2691.00 TO NODE   2689.00 =     625.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2689.00 TO NODE   2689.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.02
  RAINFALL INTENSITY(INCH/HR) =   6.30
  TOTAL STREAM AREA(ACRES) =     4.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.72

****************************************************************************
  FLOW PROCESS FROM NODE   2696.00 TO NODE   2695.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1464.00
  DOWNSTREAM ELEVATION(FEET) =   1461.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.772
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.938
  SUBAREA RUNOFF(CFS) =      1.04
  TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      1.04

****************************************************************************
  FLOW PROCESS FROM NODE   2695.50 TO NODE   2689.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1458.00  DOWNSTREAM(FEET) =  1433.60
  FLOW LENGTH(FEET) =   600.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.99
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.04
  PIPE TRAVEL TIME(MIN.) =   1.67    Tc(MIN.) =    9.44
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2689.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2689.00 TO NODE   2689.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.44
  RAINFALL INTENSITY(INCH/HR) =   6.12
  TOTAL STREAM AREA(ACRES) =     0.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.04

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.72     9.02        6.304          4.46
      2        1.04     9.44        6.120          0.43

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.71     9.02       6.304
      2       15.33     9.44       6.120

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.71   Tc(MIN.) =    9.02
  TOTAL AREA(ACRES) =        4.9
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2689.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2689.00 TO NODE   2688.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1433.60  DOWNSTREAM(FEET) =  1363.00
  FLOW LENGTH(FEET) =   975.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.77
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.71
  PIPE TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =   10.05
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2688.00 =    1655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2688.00 TO NODE   2688.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.05
  RAINFALL INTENSITY(INCH/HR) =   5.88
  TOTAL STREAM AREA(ACRES) =     4.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.71

****************************************************************************
  FLOW PROCESS FROM NODE   2699.00 TO NODE   2698.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1605.00
  DOWNSTREAM ELEVATION(FEET) =   1590.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.401
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE   2698.00 TO NODE   2697.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1590.00  DOWNSTREAM(FEET) =   1494.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.2021
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1611 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.68
  FLOW VELOCITY(FEET/SEC) =   2.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.52   Tc(MIN.) =    9.30
  LONGEST FLOWPATH FROM NODE   2699.00 TO NODE   2697.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2698.00 TO NODE   2697.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.180
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.66   SUBAREA RUNOFF(CFS) =    3.59
  TOTAL AREA(ACRES) =        1.9   TOTAL RUNOFF(CFS) =       4.09
  TC(MIN.) =    9.30

****************************************************************************
  FLOW PROCESS FROM NODE   2697.00 TO NODE   2690.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1494.00  DOWNSTREAM(FEET) =   1375.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.2311
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1737 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       4.09
  FLOW VELOCITY(FEET/SEC) =   3.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.30   Tc(MIN.) =   11.60
  LONGEST FLOWPATH FROM NODE   2699.00 TO NODE   2690.00 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2697.00 TO NODE   2690.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.358
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    6.14   SUBAREA RUNOFF(CFS) =   11.52
  TOTAL AREA(ACRES) =        8.0   TOTAL RUNOFF(CFS) =      15.06
  TC(MIN.) =   11.60

****************************************************************************
  FLOW PROCESS FROM NODE   2690.00 TO NODE   2688.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1369.00  DOWNSTREAM(FEET) =  1363.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.86
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      15.06
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   11.65
  LONGEST FLOWPATH FROM NODE   2699.00 TO NODE   2688.00 =    1125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2688.00 TO NODE   2688.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.65
  RAINFALL INTENSITY(INCH/HR) =   5.35
  TOTAL STREAM AREA(ACRES) =     8.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       15.71    10.05        5.879          4.89
      2       15.06    11.65        5.345          8.03

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       28.71    10.05       5.879
      2       29.35    11.65       5.345

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      29.35   Tc(MIN.) =   11.65
  TOTAL AREA(ACRES) =       12.9
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2688.00 =    1655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2688.00 TO NODE   2681.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1363.00  DOWNSTREAM(FEET) =  1362.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.01
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      29.35
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   11.72
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2681.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2681.00 TO NODE   2681.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2687.00 TO NODE   2686.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1411.00
  DOWNSTREAM ELEVATION(FEET) =   1409.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.63
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.63

****************************************************************************
  FLOW PROCESS FROM NODE   2686.00 TO NODE   2685.50 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1409.00  DOWNSTREAM ELEVATION(FEET) = 1390.00
  STREET LENGTH(FEET) =   415.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.44
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
  STREET FLOW TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =    9.13
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.253
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.516
  SUBAREA AREA(ACRES) =    2.96      SUBAREA RUNOFF(CFS) =    9.62
  TOTAL AREA(ACRES) =        3.2        PEAK FLOW RATE(CFS) =      10.19

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.91
  FLOW VELOCITY(FEET/SEC.) =  5.62   DEPTH*VELOCITY(FT*FT/SEC.) =   2.10
  LONGEST FLOWPATH FROM NODE   2687.00 TO NODE   2685.50 =     495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2685.50 TO NODE   2685.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1384.00  DOWNSTREAM(FEET) =  1380.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.19
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    9.20
  LONGEST FLOWPATH FROM NODE   2687.00 TO NODE   2685.00 =     555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2685.00 TO NODE   2682.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1380.00  DOWNSTREAM(FEET) =   1379.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    85.00   CHANNEL SLOPE =  0.0118
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.046
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.40
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   0.42
  Tc(MIN.) =    9.62
  SUBAREA AREA(ACRES) =     0.25       SUBAREA RUNOFF(CFS) =    0.53
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.503
  TOTAL AREA(ACRES) =        3.4         PEAK FLOW RATE(CFS) =      10.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   3.39
  LONGEST FLOWPATH FROM NODE   2687.00 TO NODE   2682.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2682.00 TO NODE   2682.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.62
  RAINFALL INTENSITY(INCH/HR) =   6.05
  TOTAL STREAM AREA(ACRES) =     3.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.38

****************************************************************************
  FLOW PROCESS FROM NODE   2684.00 TO NODE   2683.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1467.00
  DOWNSTREAM ELEVATION(FEET) =   1423.00
  ELEVATION DIFFERENCE(FEET) =     44.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      1.26
  TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      1.26

****************************************************************************
  FLOW PROCESS FROM NODE   2683.00 TO NODE   2682.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =  1417.00  DOWNSTREAM(FEET) =  1373.00
 FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   1.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.13
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.26
 PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    6.40
 LONGEST FLOWPATH FROM NODE   2684.00 TO NODE   2682.00 =     210.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2682.00 TO NODE   2682.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.40
 RAINFALL INTENSITY(INCH/HR) =   7.87
 TOTAL STREAM AREA(ACRES) =     0.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.26

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       10.38     9.62        6.046          3.41
     2        1.26     6.40        7.867          0.45

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        8.16     6.40       7.867
     2       11.34     9.62       6.046

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.34   Tc(MIN.) =    9.62
 TOTAL AREA(ACRES) =        3.9
 LONGEST FLOWPATH FROM NODE   2687.00 TO NODE   2682.00 =     640.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2682.00 TO NODE   2681.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1373.00  DOWNSTREAM(FEET) =  1362.00
  FLOW LENGTH(FEET) =   415.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.93
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.34
  PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =   10.32
  LONGEST FLOWPATH FROM NODE   2687.00 TO NODE   2681.00 =    1055.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2681.00 TO NODE   2681.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       11.34    10.32       5.779        3.86
  LONGEST FLOWPATH FROM NODE   2687.00 TO NODE   2681.00 =    1055.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       29.35    11.72       5.323       12.92
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2681.00 =    1705.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      37.18      10.32        5.779
      2      39.79      11.72        5.323

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      39.79   Tc(MIN.) =   11.72
  TOTAL AREA(ACRES) =       16.8

****************************************************************************
  FLOW PROCESS FROM NODE   2681.00 TO NODE   2681.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2681.00 TO NODE   2676.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1362.00  DOWNSTREAM(FEET) =  1359.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.06
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      39.79
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   11.81
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2676.00 =    1785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2676.00 TO NODE   2676.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.81
  RAINFALL INTENSITY(INCH/HR) =   5.30
  TOTAL STREAM AREA(ACRES) =    16.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     39.79

****************************************************************************
  FLOW PROCESS FROM NODE   2680.00 TO NODE   2679.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1447.00
  DOWNSTREAM ELEVATION(FEET) =   1443.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.175
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.019
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
  FLOW PROCESS FROM NODE   2679.00 TO NODE   2678.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1443.00  DOWNSTREAM ELEVATION(FEET) = 1369.50
  STREET LENGTH(FEET) =   730.00   CURB HEIGHT(INCHES) =  6.0
```

```
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    6.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.44
  STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =    7.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.281
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    1.38      SUBAREA RUNOFF(CFS) =    5.22
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       5.72

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   8.41
  FLOW VELOCITY(FEET/SEC.) =  6.69   DEPTH*VELOCITY(FT*FT/SEC.) =   1.90
  LONGEST FLOWPATH FROM NODE   2680.00 TO NODE   2678.00 =     805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2678.00 TO NODE   2677.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1365.00  DOWNSTREAM(FEET) =  1364.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.21
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.72
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    7.29
  LONGEST FLOWPATH FROM NODE   2680.00 TO NODE   2677.00 =     845.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2677.00 TO NODE   2676.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1364.00  DOWNSTREAM(FEET) =  1359.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.54
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.72
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    7.36
 LONGEST FLOWPATH FROM NODE   2680.00 TO NODE   2676.00 =     895.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2676.00 TO NODE   2676.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.36
 RAINFALL INTENSITY(INCH/HR) =   7.19
 TOTAL STREAM AREA(ACRES) =     1.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.72

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       39.79    11.81        5.297         16.78
     2        5.72     7.36        7.189          1.51

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       30.50     7.36       7.189
     2       44.01    11.81       5.297

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      44.01   Tc(MIN.) =   11.81
 TOTAL AREA(ACRES) =       18.3
 LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2676.00 =    1785.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2676.00 TO NODE   2672.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1359.00  DOWNSTREAM(FEET) =  1323.00
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.62
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      44.01
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   12.04
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2672.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2672.00 TO NODE   2672.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.04
  RAINFALL INTENSITY(INCH/HR) =   5.23
  TOTAL STREAM AREA(ACRES) =    18.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.01

****************************************************************************
  FLOW PROCESS FROM NODE   2675.00 TO NODE   2674.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1427.00
  DOWNSTREAM ELEVATION(FEET) =   1420.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.553
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.618
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.15

****************************************************************************
  FLOW PROCESS FROM NODE   2674.00 TO NODE   2673.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1420.00  DOWNSTREAM(FEET) =   1330.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.2045
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1623 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.15
  FLOW VELOCITY(FEET/SEC) =   2.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.25   Tc(MIN.) =    8.80
  LONGEST FLOWPATH FROM NODE   2675.00 TO NODE   2673.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2674.00 TO NODE   2673.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.402
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    2.36   SUBAREA RUNOFF(CFS) =    5.29
  TOTAL AREA(ACRES) =        2.4   TOTAL RUNOFF(CFS) =       5.40
  TC(MIN.) =    8.80

****************************************************************************
  FLOW PROCESS FROM NODE   2673.00 TO NODE   2672.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1324.00  DOWNSTREAM(FEET) =  1323.00
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.39
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.40
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    8.84
  LONGEST FLOWPATH FROM NODE   2675.00 TO NODE   2672.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2672.00 TO NODE   2672.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.84
  RAINFALL INTENSITY(INCH/HR) =   6.39
  TOTAL STREAM AREA(ACRES) =     2.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       44.01    12.04        5.233         18.29
      2        5.40     8.84        6.387          2.41

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       41.45     8.84       6.387
      2       48.43    12.04       5.233

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      48.43   Tc(MIN.) =   12.04
  TOTAL AREA(ACRES) =       20.7
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2672.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2672.00 TO NODE   2651.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1323.00  DOWNSTREAM(FEET) =  1309.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.40
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.43
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   12.26
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2651.00 =    2355.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2651.00 TO NODE   2651.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2671.00 TO NODE   2670.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1445.00
  DOWNSTREAM ELEVATION(FEET) =   1420.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   2670.00 TO NODE   2669.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1420.00  DOWNSTREAM(FEET) =   1385.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE =  0.1250
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1183 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.50
  FLOW VELOCITY(FEET/SEC) =   1.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =    9.52
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2669.00 =     380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2670.00 TO NODE   2669.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.085
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2875
  SUBAREA AREA(ACRES) =    4.07   SUBAREA RUNOFF(CFS) =    7.18
  TOTAL AREA(ACRES) =        4.3   TOTAL RUNOFF(CFS) =       7.59
  TC(MIN.) =    9.52
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2669.00 TO NODE   2668.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1379.00  DOWNSTREAM(FEET) =  1375.00
  FLOW LENGTH(FEET) =   415.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.59
  PIPE TRAVEL TIME(MIN.) =   1.13    Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2668.00 =     795.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2668.00 TO NODE   2663.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1375.00  DOWNSTREAM(FEET) =   1348.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0450
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.59
  FLOW VELOCITY(FEET/SEC) =   4.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =   12.68
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2663.00 =    1395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2663.00 TO NODE   2663.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.68
  RAINFALL INTENSITY(INCH/HR) =   5.06
  TOTAL STREAM AREA(ACRES) =     4.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.59

****************************************************************************
  FLOW PROCESS FROM NODE   2667.00 TO NODE   2666.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1420.00
  DOWNSTREAM ELEVATION(FEET) =   1405.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   2666.00 TO NODE   2663.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1405.00  DOWNSTREAM(FEET) =   1348.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   680.00   CHANNEL SLOPE =  0.0838
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0838 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.53
  FLOW VELOCITY(FEET/SEC) =   1.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.99   Tc(MIN.) =   13.26
  LONGEST FLOWPATH FROM NODE   2667.00 TO NODE   2663.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2666.00 TO NODE   2663.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.917
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    2.98   SUBAREA RUNOFF(CFS) =    5.13
  TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =       5.46
  TC(MIN.) =   13.26

****************************************************************************
  FLOW PROCESS FROM NODE   2663.00 TO NODE   2663.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.26
```

```
  RAINFALL INTENSITY(INCH/HR) =   4.92
  TOTAL STREAM AREA(ACRES) =     3.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.46

****************************************************************************
  FLOW PROCESS FROM NODE   2665.50 TO NODE   2665.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1363.00
  DOWNSTREAM ELEVATION(FEET) =   1361.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
  FLOW PROCESS FROM NODE   2665.00 TO NODE   2664.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1361.00  DOWNSTREAM ELEVATION(FEET) = 1350.00
  STREET LENGTH(FEET) =   550.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    9.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =   10.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.666
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.459
  SUBAREA AREA(ACRES) =    4.22      SUBAREA RUNOFF(CFS) =   11.00
  TOTAL AREA(ACRES) =        4.5        PEAK FLOW RATE(CFS) =      11.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  12.16
  FLOW VELOCITY(FEET/SEC.) =  3.58   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  LONGEST FLOWPATH FROM NODE   2665.50 TO NODE   2664.00 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2664.00 TO NODE   2663.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1344.00  DOWNSTREAM(FEET) =  1342.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.56
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.64
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   10.85
  LONGEST FLOWPATH FROM NODE   2665.50 TO NODE   2663.00 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2663.00 TO NODE   2663.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.85
  RAINFALL INTENSITY(INCH/HR) =   5.59
  TOTAL STREAM AREA(ACRES) =     4.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.64

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.59    12.68        5.061          4.34
      2        5.46    13.26        4.917          3.17
      3       11.64    10.85        5.594          4.47

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       22.60    10.85       5.594
      2       23.34    12.68       5.061
      3       23.06    13.26       4.917

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.34   Tc(MIN.) =   12.68
  TOTAL AREA(ACRES) =       12.0
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2663.00 =    1395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2663.00 TO NODE   2657.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1342.00  DOWNSTREAM(FEET) =  1312.00
  FLOW LENGTH(FEET) =   372.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.89
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.34
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   13.02
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2657.00 =    1767.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2657.00 TO NODE   2657.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.02
  RAINFALL INTENSITY(INCH/HR) =   4.97
  TOTAL STREAM AREA(ACRES) =    11.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.34

****************************************************************************
  FLOW PROCESS FROM NODE   2662.00 TO NODE   2661.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    66.67
  UPSTREAM ELEVATION(FEET) =   1400.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.346
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.627
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE   2661.00 TO NODE   2660.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1399.00  DOWNSTREAM ELEVATION(FEET) = 1355.00
  STREET LENGTH(FEET) =   935.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.85
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    9.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.45
  STREET FLOW TRAVEL TIME(MIN.) =   3.24   Tc(MIN.) =   11.59
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.363
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    3.60      SUBAREA RUNOFF(CFS) =    8.69
  TOTAL AREA(ACRES) =        3.8        PEAK FLOW RATE(CFS) =       9.07

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  12.22
  FLOW VELOCITY(FEET/SEC.) =  5.53   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  LONGEST FLOWPATH FROM NODE   2662.00 TO NODE   2660.00 =    1001.67 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2660.00 TO NODE   2659.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1349.00  DOWNSTREAM(FEET) =  1348.40
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.39
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.07
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   11.74
  LONGEST FLOWPATH FROM NODE   2662.00 TO NODE   2659.00 =    1061.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2659.00 TO NODE   2658.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1348.40  DOWNSTREAM(FEET) =   1347.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =    80.00   CHANNEL SLOPE =  0.0100
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.194
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.09
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   0.43
  Tc(MIN.) =   12.17
  SUBAREA AREA(ACRES) =     0.17       SUBAREA RUNOFF(CFS) =    0.22
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.441
  TOTAL AREA(ACRES) =        3.9         PEAK FLOW RATE(CFS) =       9.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   3.08
  LONGEST FLOWPATH FROM NODE   2662.00 TO NODE   2658.00 =    1141.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2658.00 TO NODE   2657.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1342.00  DOWNSTREAM(FEET) =  1313.00
  FLOW LENGTH(FEET) =   540.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.29
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.07
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =   12.91
  LONGEST FLOWPATH FROM NODE   2662.00 TO NODE   2657.00 =    1681.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2657.00 TO NODE   2657.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.91
  RAINFALL INTENSITY(INCH/HR) =   5.00
  TOTAL STREAM AREA(ACRES) =     3.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.07

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       23.34    13.02        4.973         11.98
      2        9.07    12.91        5.002          3.93

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       32.28    12.91       5.002
      2       32.36    13.02       4.973

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      32.36   Tc(MIN.) =   13.02
  TOTAL AREA(ACRES) =       15.9
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2657.00 =    1767.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2657.00 TO NODE   2650.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1312.00  DOWNSTREAM(FEET) =  1308.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.01
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.36
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   13.13
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2650.60 =    1867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2650.60 TO NODE   2650.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.13
  RAINFALL INTENSITY(INCH/HR) =   4.95
  TOTAL STREAM AREA(ACRES) =    15.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.36

****************************************************************************
  FLOW PROCESS FROM NODE   2650.90 TO NODE   2650.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1356.00
  DOWNSTREAM ELEVATION(FEET) =   1354.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE   2650.80 TO NODE   2650.70 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1354.00  DOWNSTREAM ELEVATION(FEET) = 1315.00
  STREET LENGTH(FEET) =   690.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    9.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
  STREET FLOW TRAVEL TIME(MIN.) =   2.17   Tc(MIN.) =    9.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.941
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    3.79      SUBAREA RUNOFF(CFS) =   10.13
  TOTAL AREA(ACRES) =        3.9        PEAK FLOW RATE(CFS) =      10.40

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.47
  FLOW VELOCITY(FEET/SEC.) =  6.11   DEPTH*VELOCITY(FT*FT/SEC.) =   2.23
  LONGEST FLOWPATH FROM NODE   2650.90 TO NODE   2650.70 =     770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2650.70 TO NODE   2650.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1309.00  DOWNSTREAM(FEET) =  1308.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.38
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.40
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   10.05
  LONGEST FLOWPATH FROM NODE   2650.90 TO NODE   2650.60 =     845.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2650.60 TO NODE   2650.60 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.05
  RAINFALL INTENSITY(INCH/HR) =   5.88
  TOTAL STREAM AREA(ACRES) =     3.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       32.36    13.13        4.946         15.91
      2       10.40    10.05        5.877          3.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       37.64    10.05       5.877
      2       41.11    13.13       4.946

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      41.11   Tc(MIN.) =   13.13
  TOTAL AREA(ACRES) =       19.8
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2650.60 =    1867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2650.60 TO NODE   2650.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1308.00  DOWNSTREAM(FEET) =  1298.20
  FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  22.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.79
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.11
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   13.84
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2650.00 =    2367.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2650.00 TO NODE   2650.00 IS CODE =  10
----------------------------------------------------------------------------
```

```
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   2656.00 TO NODE   2655.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    55.00
  UPSTREAM ELEVATION(FEET) =   1390.00
  DOWNSTREAM ELEVATION(FEET) =   1389.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.992
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.814
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.53

********************************************************************************
  FLOW PROCESS FROM NODE   2655.00 TO NODE   2654.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1389.50  DOWNSTREAM ELEVATION(FEET) = 1315.00
  STREET LENGTH(FEET) =   970.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.69
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    6.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.19
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.23
  STREET FLOW TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =   11.11
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.510
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    1.50      SUBAREA RUNOFF(CFS) =    4.30
  TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =       4.73

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   8.22
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE   2656.00 TO NODE   2654.00 =    1025.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2654.00 TO NODE   2653.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1309.00  DOWNSTREAM(FEET) =  1305.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.84
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.73
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   11.18
  LONGEST FLOWPATH FROM NODE   2656.00 TO NODE   2653.00 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2653.00 TO NODE   2652.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =   1304.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =    30.00   CHANNEL SLOPE =  0.0100
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.434
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.93
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   0.17
  Tc(MIN.) =   11.35
  SUBAREA AREA(ACRES) =     3.18       SUBAREA RUNOFF(CFS) =    6.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.408
  TOTAL AREA(ACRES) =        4.8         PEAK FLOW RATE(CFS) =      10.71
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   3.21
  LONGEST FLOWPATH FROM NODE   2656.00 TO NODE   2652.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2652.00 TO NODE   2651.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1299.00  DOWNSTREAM(FEET) =  1298.50
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.18
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.71
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   11.44
  LONGEST FLOWPATH FROM NODE   2656.00 TO NODE   2651.00 =    1145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2651.00 TO NODE   2651.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.71    11.44       5.406        4.83
  LONGEST FLOWPATH FROM NODE   2656.00 TO NODE   2651.00 =    1145.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       48.43    12.26       5.170       20.70
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2651.00 =    2355.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      55.91      11.44        5.406
      2      58.68      12.26        5.170

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      58.68   Tc(MIN.) =   12.26
  TOTAL AREA(ACRES) =       25.5
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2651.00 TO NODE   2651.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2651.00 TO NODE   2650.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1298.50  DOWNSTREAM(FEET) =  1298.20
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.17
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      58.68
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   12.31
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2650.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2650.00 TO NODE   2650.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       58.68    12.31       5.157       25.53
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2650.00 =    2385.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       41.11    13.84       4.782       19.80
  LONGEST FLOWPATH FROM NODE   2671.00 TO NODE   2650.00 =    2367.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      95.25      12.31        5.157
      2      95.52      13.84        4.782

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      95.52   Tc(MIN.) =   13.84
  TOTAL AREA(ACRES) =       45.3
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2650.00 TO NODE   2650.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2650.00 TO NODE   2635.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1298.20  DOWNSTREAM(FEET) =  1292.50
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.77
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      95.52
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =   13.98
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2635.00 =    2545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2635.00 TO NODE   2635.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2649.00 TO NODE   2648.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1400.00
  DOWNSTREAM ELEVATION(FEET) =   1398.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
  FLOW PROCESS FROM NODE   2648.00 TO NODE   2647.00 IS CODE =  62
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1398.00  DOWNSTREAM ELEVATION(FEET) = 1380.00
  STREET LENGTH(FEET) =   720.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.66
  STREET FLOW TRAVEL TIME(MIN.) =   2.81   Tc(MIN.) =   10.52
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.706
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.469
  SUBAREA AREA(ACRES) =    5.78      SUBAREA RUNOFF(CFS) =   15.50
  TOTAL AREA(ACRES) =        6.0        PEAK FLOW RATE(CFS) =      16.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.59
  FLOW VELOCITY(FEET/SEC.) =  4.98   DEPTH*VELOCITY(FT*FT/SEC.) =   2.33
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2647.00 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2647.00 TO NODE   2643.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1374.00  DOWNSTREAM(FEET) =  1361.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.97
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.14
```

```
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   10.91
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2643.00 =    1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2643.00 TO NODE   2643.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.91
  RAINFALL INTENSITY(INCH/HR) =   5.58
  TOTAL STREAM AREA(ACRES) =     6.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.14

****************************************************************************
  FLOW PROCESS FROM NODE   2646.00 TO NODE   2645.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1395.00
  DOWNSTREAM ELEVATION(FEET) =   1393.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.25

****************************************************************************
  FLOW PROCESS FROM NODE   2645.00 TO NODE   2644.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1393.00  DOWNSTREAM ELEVATION(FEET) = 1368.00
  STREET LENGTH(FEET) =   730.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```

```
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.99
  STREET FLOW TRAVEL TIME(MIN.) =   3.29   Tc(MIN.) =   11.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.546
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    4.06      SUBAREA RUNOFF(CFS) =   10.13
  TOTAL AREA(ACRES) =        4.1        PEAK FLOW RATE(CFS) =      10.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =  10.28
  FLOW VELOCITY(FEET/SEC.) =  4.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.38
  LONGEST FLOWPATH FROM NODE   2646.00 TO NODE   2644.00 =     810.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2644.00 TO NODE   2643.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1362.00  DOWNSTREAM(FEET) =  1361.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.33
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   11.09
  LONGEST FLOWPATH FROM NODE   2646.00 TO NODE   2643.00 =     860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2643.00 TO NODE   2643.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.09
  RAINFALL INTENSITY(INCH/HR) =   5.52
```

```
  TOTAL STREAM AREA(ACRES) =     4.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.14    10.91        5.575          6.03
      2       10.33    11.09        5.516          4.14

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.31    10.91       5.575
      2       26.30    11.09       5.516

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.31   Tc(MIN.) =   10.91
  TOTAL AREA(ACRES) =       10.2
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2643.00 =    1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2643.00 TO NODE   2640.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1361.00  DOWNSTREAM(FEET) =  1356.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.93
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.31
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   11.19
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2640.00 =    1300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2640.00 TO NODE   2640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.19
  RAINFALL INTENSITY(INCH/HR) =   5.49
  TOTAL STREAM AREA(ACRES) =    10.17
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.31

****************************************************************************
  FLOW PROCESS FROM NODE   2642.00 TO NODE   2641.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.58
  UPSTREAM ELEVATION(FEET) =   1378.00
  DOWNSTREAM ELEVATION(FEET) =   1376.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.837
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.901
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE   2641.00 TO NODE   2640.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1376.00  DOWNSTREAM ELEVATION(FEET) = 1362.00
  STREET LENGTH(FEET) =   610.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =   10.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   10.72
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.637
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4700
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.469
  SUBAREA AREA(ACRES) =    5.99      SUBAREA RUNOFF(CFS) =   15.87
  TOTAL AREA(ACRES) =        6.2        PEAK FLOW RATE(CFS) =      16.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.66
  FLOW VELOCITY(FEET/SEC.) =  4.08   DEPTH*VELOCITY(FT*FT/SEC.) =   1.59
  LONGEST FLOWPATH FROM NODE   2642.00 TO NODE   2640.00 =     691.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2640.00 TO NODE   2640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.72
  RAINFALL INTENSITY(INCH/HR) =   5.64
  TOTAL STREAM AREA(ACRES) =     6.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.43

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.31    11.19        5.485         10.17
      2       16.43    10.72        5.637          6.21

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       42.02    10.72       5.637
      2       42.29    11.19       5.485

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.29   Tc(MIN.) =   11.19
  TOTAL AREA(ACRES) =       16.4
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2640.00 =    1300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2640.00 TO NODE   2639.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1362.00  DOWNSTREAM(FEET) =  1342.00
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.86
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.29
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   11.35
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2639.00 =    1510.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2639.00 TO NODE   2638.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1342.00  DOWNSTREAM(FEET) =  1314.00
  FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.22
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.29
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   11.66
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2638.00 =    1890.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2638.00 TO NODE   2637.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1314.00  DOWNSTREAM(FEET) =  1295.00
  FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.24
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.29
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   12.03
  LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2637.00 =    2270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2637.00 TO NODE   2636.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1293.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   200.00   CHANNEL SLOPE =  0.0100
```

```
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.047
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5200
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.75
 AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   0.70
 Tc(MIN.) =   12.73
 SUBAREA AREA(ACRES) =     1.02       SUBAREA RUNOFF(CFS) =    2.68
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.468
 TOTAL AREA(ACRES) =       17.4         PEAK FLOW RATE(CFS) =      42.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   4.71
 LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2636.00 =    2470.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2636.00 TO NODE   2635.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1293.00  DOWNSTREAM(FEET) =  1292.50
 FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.24
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      42.29
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   12.76
 LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2635.00 =    2490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2635.00 TO NODE   2635.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       42.29    12.76       5.040       17.40
 LONGEST FLOWPATH FROM NODE   2649.00 TO NODE   2635.00 =    2490.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
```

```
     1       95.52    13.98       4.751       45.33
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2635.00 =    2545.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     129.44      12.76        5.040
      2     135.38      13.98        4.751

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     135.38   Tc(MIN.) =   13.98
  TOTAL AREA(ACRES) =       62.7

****************************************************************************
  FLOW PROCESS FROM NODE   2635.00 TO NODE   2635.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2635.00 TO NODE   2631.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1292.50  DOWNSTREAM(FEET) =  1278.50
  FLOW LENGTH(FEET) =   195.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.64
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     135.38
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   14.10
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2631.00 =    2740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2631.00 TO NODE   2631.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.10
  RAINFALL INTENSITY(INCH/HR) =   4.72
  TOTAL STREAM AREA(ACRES) =    62.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    135.38

****************************************************************************
  FLOW PROCESS FROM NODE   2634.00 TO NODE   2633.00 IS CODE =  21
```

```
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1435.00
  DOWNSTREAM ELEVATION(FEET) =   1405.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.431
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.23
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.23

************************************************************************
  FLOW PROCESS FROM NODE   2633.00 TO NODE   2632.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1405.00  DOWNSTREAM(FEET) =   1285.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.2222
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.642
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.19
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   1.10
  Tc(MIN.) =    5.53
  SUBAREA AREA(ACRES) =     4.39       SUBAREA RUNOFF(CFS) =   13.28
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =      13.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =  10.22
  LONGEST FLOWPATH FROM NODE   2634.00 TO NODE   2632.00 =     590.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   2632.00 TO NODE   2631.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1279.00  DOWNSTREAM(FEET) =  1278.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.07
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.49
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    5.65
  LONGEST FLOWPATH FROM NODE   2634.00 TO NODE   2631.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2631.00 TO NODE   2631.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.65
  RAINFALL INTENSITY(INCH/HR) =   8.53
  TOTAL STREAM AREA(ACRES) =     4.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.49

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      135.38    14.10        4.724         62.73
      2       13.49     5.65        8.525          4.46

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       67.70     5.65       8.525
      2      142.86    14.10       4.724

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     142.86   Tc(MIN.) =   14.10
  TOTAL AREA(ACRES) =       67.2
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2631.00 =    2740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2631.00 TO NODE   2627.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1278.50  DOWNSTREAM(FEET) =  1253.00
  FLOW LENGTH(FEET) =   600.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.98
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     142.86
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   14.56
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2627.00 =    3340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2627.00 TO NODE   2627.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.56
  RAINFALL INTENSITY(INCH/HR) =   4.63
  TOTAL STREAM AREA(ACRES) =    67.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    142.86

****************************************************************************
  FLOW PROCESS FROM NODE   2630.00 TO NODE   2629.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1390.00
  DOWNSTREAM ELEVATION(FEET) =   1352.00
  ELEVATION DIFFERENCE(FEET) =     38.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE   2629.00 TO NODE   2628.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1352.00  DOWNSTREAM(FEET) =   1262.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.00   CHANNEL SLOPE =  0.0657
```

```
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.131
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.30
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   5.31
  Tc(MIN.) =   12.41
  SUBAREA AREA(ACRES) =     4.60       SUBAREA RUNOFF(CFS) =    5.90
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        4.8         PEAK FLOW RATE(CFS) =       6.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   5.20
  LONGEST FLOWPATH FROM NODE   2630.00 TO NODE   2628.00 =    1470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2628.00 TO NODE   2627.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1256.00  DOWNSTREAM(FEET) =  1253.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.23
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.13
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   12.66
  LONGEST FLOWPATH FROM NODE   2630.00 TO NODE   2627.00 =    1595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2627.00 TO NODE   2627.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.66
  RAINFALL INTENSITY(INCH/HR) =   5.06
  TOTAL STREAM AREA(ACRES) =     4.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.13

  ** CONFLUENCE DATA **
```

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	142.86	14.56	4.628	67.19
2	6.13	12.66	5.065	4.78

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	136.68	12.66	5.065
2	148.46	14.56	4.628

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 148.46 Tc(MIN.) = 14.56
TOTAL AREA(ACRES) = 72.0
LONGEST FLOWPATH FROM NODE 2696.00 TO NODE 2627.00 = 3340.00 FEET.

****
FLOW PROCESS FROM NODE 2627.00 TO NODE 2623.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1253.00 DOWNSTREAM(FEET) = 1197.00
FLOW LENGTH(FEET) = 1335.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 39.0 INCH PIPE IS 29.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 21.96
ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 148.46
PIPE TRAVEL TIME(MIN.) = 1.01 Tc(MIN.) = 15.57
LONGEST FLOWPATH FROM NODE 2696.00 TO NODE 2623.00 = 4675.00 FEET.

****
FLOW PROCESS FROM NODE 2623.00 TO NODE 2623.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 15.57
RAINFALL INTENSITY(INCH/HR) = 4.43
TOTAL STREAM AREA(ACRES) = 71.97
PEAK FLOW RATE(CFS) AT CONFLUENCE = 148.46

****
FLOW PROCESS FROM NODE 2626.00 TO NODE 2625.00 IS CODE = 21

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1330.00
  DOWNSTREAM ELEVATION(FEET) =   1280.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.352
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.902
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   2625.00 TO NODE   2624.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =   1207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.1659
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.106
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.14
  Tc(MIN.) =    7.49
  SUBAREA AREA(ACRES) =     4.59       SUBAREA RUNOFF(CFS) =    8.15
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =        4.8         PEAK FLOW RATE(CFS) =       8.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   8.03
  LONGEST FLOWPATH FROM NODE   2626.00 TO NODE   2624.00 =     520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2624.00 TO NODE   2623.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1201.00  DOWNSTREAM(FEET) =  1197.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.96
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.49
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    7.70
  LONGEST FLOWPATH FROM NODE   2626.00 TO NODE   2623.00 =     645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2623.00 TO NODE   2623.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.70
  RAINFALL INTENSITY(INCH/HR) =   6.98
  TOTAL STREAM AREA(ACRES) =     4.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.49

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      148.46    15.57        4.432         71.97
      2        8.49     7.70        6.981          4.78

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      102.74     7.70       6.981
      2      153.85    15.57       4.432

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     153.85   Tc(MIN.) =   15.57
  TOTAL AREA(ACRES) =       76.8
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE   2623.00 =    4675.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2623.00 TO NODE    287.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1196.00  DOWNSTREAM(FEET) =  1185.50
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.59
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     153.85
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   15.65
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE    287.00 =    4805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    287.00 TO NODE    287.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2622.00 TO NODE   2621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1435.00
  DOWNSTREAM ELEVATION(FEET) =   1395.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE   2621.00 TO NODE   2620.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   645.00   CHANNEL SLOPE =  0.1860
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1530 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.75
  FLOW VELOCITY(FEET/SEC) =   2.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.91   Tc(MIN.) =   11.17
```

```
 LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2620.00 =     745.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2621.00 TO NODE   2620.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.490
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3407
 SUBAREA AREA(ACRES) =    3.37   SUBAREA RUNOFF(CFS) =    6.29
 TOTAL AREA(ACRES) =        3.6   TOTAL RUNOFF(CFS) =       6.81
 TC(MIN.) =   11.17

****************************************************************************
 FLOW PROCESS FROM NODE   2620.00 TO NODE   2616.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1261.00  DOWNSTREAM(FEET) =  1231.00
 FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.07
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.81
 PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =   11.66
 LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2616.00 =    1125.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2616.00 TO NODE   2616.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.66
 RAINFALL INTENSITY(INCH/HR) =   5.34
 TOTAL STREAM AREA(ACRES) =     3.64
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.81

****************************************************************************
 FLOW PROCESS FROM NODE   2619.00 TO NODE   2618.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1249.00
  DOWNSTREAM ELEVATION(FEET) =   1247.70
  ELEVATION DIFFERENCE(FEET) =      1.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.487
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.107
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.54

******************************************************************************
  FLOW PROCESS FROM NODE   2618.00 TO NODE   2617.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1247.70  DOWNSTREAM(FEET) =   1239.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   420.00   CHANNEL SLOPE =  0.0207
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.084
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.43
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =    9.53
  SUBAREA AREA(ACRES) =     3.59       SUBAREA RUNOFF(CFS) =    9.83
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  TOTAL AREA(ACRES) =        3.8         PEAK FLOW RATE(CFS) =      10.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2617.00 =     485.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2617.00 TO NODE   2616.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1236.00  DOWNSTREAM(FEET) =  1231.00
  FLOW LENGTH(FEET) =   415.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.9 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.29
  PIPE TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =   10.51
  LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2616.00 =     900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2616.00 TO NODE   2616.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.51
  RAINFALL INTENSITY(INCH/HR) =   5.71
  TOTAL STREAM AREA(ACRES) =     3.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.29

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.81    11.66        5.341          3.64
      2       10.29    10.51        5.711          3.76

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.43    10.51       5.711
      2       16.44    11.66       5.341

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.44   Tc(MIN.) =   11.66
  TOTAL AREA(ACRES) =        7.4
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2616.00 =    1125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2616.00 TO NODE   2616.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1231.00  DOWNSTREAM(FEET) =  1223.00
  FLOW LENGTH(FEET) =   540.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.6 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.60
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.44
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =   12.70
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2616.80 =    1665.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2616.80 TO NODE   2616.80 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2611.00 TO NODE   2610.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1292.00
  DOWNSTREAM ELEVATION(FEET) =   1290.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.880
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.506
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE   2610.00 TO NODE   2609.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1290.00  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.49
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.29
  STREET FLOW TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =    8.38
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.608
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.482
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    6.03
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       6.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =  10.09
  FLOW VELOCITY(FEET/SEC.) =  5.52   DEPTH*VELOCITY(FT*FT/SEC.) =   1.76
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2609.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2609.00 TO NODE   2606.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1259.00  DOWNSTREAM(FEET) =  1241.00
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.03
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.44
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    8.76
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2606.20 =     790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2606.20 TO NODE   2606.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.76
  RAINFALL INTENSITY(INCH/HR) =   6.42
  TOTAL STREAM AREA(ACRES) =     2.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.44
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2606.60 TO NODE   2606.40 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1267.00
  DOWNSTREAM ELEVATION(FEET) =   1265.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE   2606.40 TO NODE   2606.20 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1265.00  DOWNSTREAM ELEVATION(FEET) = 1248.00
  STREET LENGTH(FEET) =   215.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =    8.44
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.581
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
```

```
  SUBAREA AREA(ACRES) =    0.92      SUBAREA RUNOFF(CFS) =    2.72
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.59
  FLOW VELOCITY(FEET/SEC.) =  5.34   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
  LONGEST FLOWPATH FROM NODE   2606.60 TO NODE   2606.20 =     295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2606.20 TO NODE   2606.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.44
  RAINFALL INTENSITY(INCH/HR) =   6.58
  TOTAL STREAM AREA(ACRES) =     1.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.11

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.44     8.76        6.421          2.02
      2        3.11     8.44        6.581          1.05

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.31     8.44       6.581
      2        9.47     8.76       6.421

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.47   Tc(MIN.) =    8.76
  TOTAL AREA(ACRES) =        3.1
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2606.20 =     790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2606.20 TO NODE   2606.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1242.00  DOWNSTREAM(FEET) =  1232.00
```

```
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.85
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.47
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    8.98
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2606.00 =     960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2606.00 TO NODE   2606.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.98
  RAINFALL INTENSITY(INCH/HR) =   6.32
  TOTAL STREAM AREA(ACRES) =     3.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.47

****************************************************************************
  FLOW PROCESS FROM NODE   2608.00 TO NODE   2607.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1254.00
  DOWNSTREAM ELEVATION(FEET) =   1252.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   2607.00 TO NODE   2606.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1252.00  DOWNSTREAM ELEVATION(FEET) = 1238.00
  STREET LENGTH(FEET) =   170.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.19
    HALFSTREET FLOOD WIDTH(FEET) =    3.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
  STREET FLOW TRAVEL TIME(MIN.) =   0.57   Tc(MIN.) =    8.29
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.658
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    0.63      SUBAREA RUNOFF(CFS) =    1.89
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       2.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.22   HALFSTREET FLOOD WIDTH(FEET) =   5.34
  FLOW VELOCITY(FEET/SEC.) =  5.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.16
  LONGEST FLOWPATH FROM NODE   2608.00 TO NODE   2606.00 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2606.00 TO NODE   2606.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.29
  RAINFALL INTENSITY(INCH/HR) =   6.66
  TOTAL STREAM AREA(ACRES) =     0.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.25

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.47     8.98        6.319          3.07
      2        2.25     8.29        6.658          0.75
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.24     8.29       6.658
      2       11.61     8.98       6.319

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.61   Tc(MIN.) =    8.98
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2606.00 =     960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2606.00 TO NODE   2602.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1232.00  DOWNSTREAM(FEET) =  1226.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.61
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    9.20
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2602.00 =    1110.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2602.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.20
  RAINFALL INTENSITY(INCH/HR) =   6.22
  TOTAL STREAM AREA(ACRES) =     3.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.61

****************************************************************************
  FLOW PROCESS FROM NODE   2605.00 TO NODE   2604.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1244.00
  DOWNSTREAM ELEVATION(FEET) =   1242.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE   2604.00 TO NODE   2602.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1242.00  DOWNSTREAM ELEVATION(FEET) = 1226.00
  STREET LENGTH(FEET) =   495.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    8.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =    9.93
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.923
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    5.33
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       5.65

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.84
  FLOW VELOCITY(FEET/SEC.) =  4.27   DEPTH*VELOCITY(FT*FT/SEC.) =   1.42
```

```
  LONGEST FLOWPATH FROM NODE   2605.00 TO NODE   2602.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2602.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.93
  RAINFALL INTENSITY(INCH/HR) =   5.92
  TOTAL STREAM AREA(ACRES) =     2.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.65

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.61     9.20        6.224          3.82
      2        5.65     9.93        5.923          2.12

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.84     9.20       6.224
      2       16.70     9.93       5.923

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.84   Tc(MIN.) =    9.20
  TOTAL AREA(ACRES) =        5.9
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2602.00 =    1110.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE    298.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1226.00  DOWNSTREAM(FEET) =   1222.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00   CHANNEL SLOPE =  0.0308
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.058
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.51
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   0.39
  Tc(MIN.) =    9.59
  SUBAREA AREA(ACRES) =     0.22       SUBAREA RUNOFF(CFS) =    0.60
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.461
  TOTAL AREA(ACRES) =        6.2         PEAK FLOW RATE(CFS) =      17.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   5.51
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE    298.00 =    1240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    298.00 TO NODE   2616.80 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1216.00  DOWNSTREAM(FEET) =  1214.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.30
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.19
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    9.91
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2616.80 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2616.80 TO NODE   2616.80 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       17.19     9.91       5.931        6.16
  LONGEST FLOWPATH FROM NODE   2611.00 TO NODE   2616.80 =    1400.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       16.44    12.70       5.054        7.40
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2616.80 =    1665.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
```

```
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      30.01       9.91        5.931
      2      31.08      12.70        5.054

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.08   Tc(MIN.) =   12.70
  TOTAL AREA(ACRES) =       13.6

****************************************************************************
  FLOW PROCESS FROM NODE   2616.80 TO NODE   2616.80 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2616.80 TO NODE   2612.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1214.00  DOWNSTREAM(FEET) =  1212.00
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.29
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.08
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   12.91
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2612.00 =    1795.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2612.00 TO NODE   2612.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.91
  RAINFALL INTENSITY(INCH/HR) =   5.00
  TOTAL STREAM AREA(ACRES) =    13.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.08

****************************************************************************
  FLOW PROCESS FROM NODE   2615.00 TO NODE   2614.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1275.00
  DOWNSTREAM ELEVATION(FEET) =   1230.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE   2614.00 TO NODE   2613.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1219.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00   CHANNEL SLOPE =  0.0423
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0423 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.40
  FLOW VELOCITY(FEET/SEC) =   1.15 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   10.86
  LONGEST FLOWPATH FROM NODE   2615.00 TO NODE   2613.00 =     360.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2614.00 TO NODE   2613.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.590
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    0.67   SUBAREA RUNOFF(CFS) =    0.94
  TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       1.24
  TC(MIN.) =   10.86

****************************************************************************
  FLOW PROCESS FROM NODE   2613.00 TO NODE   2612.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1214.00  DOWNSTREAM(FEET) =  1212.00
```

```
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.26
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.24
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   11.00
  LONGEST FLOWPATH FROM NODE   2615.00 TO NODE   2612.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2612.00 TO NODE   2612.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.00
  RAINFALL INTENSITY(INCH/HR) =   5.55
  TOTAL STREAM AREA(ACRES) =     0.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.24

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       31.08    12.91        5.000         13.56
      2        1.24    11.00        5.546          0.89

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       27.71    11.00       5.546
      2       32.21    12.91       5.000

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      32.21   Tc(MIN.) =   12.91
  TOTAL AREA(ACRES) =       14.4
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE   2612.00 =    1795.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2612.00 TO NODE    292.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1212.00  DOWNSTREAM(FEET) =  1196.00
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.52
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.21
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   13.55
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE    292.00 =    2310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    292.00 TO NODE    292.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    297.00 TO NODE    296.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1236.00
  DOWNSTREAM ELEVATION(FEET) =   1234.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE    296.00 TO NODE    295.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1236.00  DOWNSTREAM ELEVATION(FEET) = 1215.00
  STREET LENGTH(FEET) =   475.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```

```
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.32
  STREET FLOW TRAVEL TIME(MIN.) =   1.75   Tc(MIN.) =    9.46
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.111
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    2.67      SUBAREA RUNOFF(CFS) =    7.34
  TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =       7.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.59
  FLOW VELOCITY(FEET/SEC.) =  5.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.81
  LONGEST FLOWPATH FROM NODE    297.00 TO NODE    295.00 =     555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    295.00 TO NODE    294.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1209.00  DOWNSTREAM(FEET) =  1206.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.75
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.75
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    9.70
  LONGEST FLOWPATH FROM NODE    297.00 TO NODE    294.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.00 TO NODE    294.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    294.90 TO NODE    294.80 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1245.00
  DOWNSTREAM ELEVATION(FEET) =   1243.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.44

******************************************************************************
  FLOW PROCESS FROM NODE    294.80 TO NODE    294.70 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1243.00  DOWNSTREAM ELEVATION(FEET) = 1238.00
  STREET LENGTH(FEET) =   270.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    5.03
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.52
  STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =    9.58
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.063
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    1.09      SUBAREA RUNOFF(CFS) =    2.97
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       3.36
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.97
  FLOW VELOCITY(FEET/SEC.) =  2.65   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    294.70 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.70 TO NODE    294.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1236.00  DOWNSTREAM(FEET) =  1223.00
  FLOW LENGTH(FEET) =   605.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.36
  PIPE TRAVEL TIME(MIN.) =   1.50    Tc(MIN.) =   11.08
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    294.10 =     955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.10 TO NODE    294.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.08
  RAINFALL INTENSITY(INCH/HR) =   5.52
  TOTAL STREAM AREA(ACRES) =     1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.36

****************************************************************************
  FLOW PROCESS FROM NODE    294.60 TO NODE    294.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1236.00
  DOWNSTREAM ELEVATION(FEET) =   1234.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.31
```

```
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    294.50 TO NODE    294.40 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1234.00  DOWNSTREAM ELEVATION(FEET) = 1233.00
  STREET LENGTH(FEET) =   100.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.61
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.41
  STREET FLOW TRAVEL TIME(MIN.) =   0.92   Tc(MIN.) =    8.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.483
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    0.89      SUBAREA RUNOFF(CFS) =    2.60
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       2.89

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.53
  FLOW VELOCITY(FEET/SEC.) =  2.02   DEPTH*VELOCITY(FT*FT/SEC.) =   0.54
  LONGEST FLOWPATH FROM NODE    294.60 TO NODE    294.40 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.40 TO NODE    294.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1227.00  DOWNSTREAM(FEET) =  1223.00
```

```
  FLOW LENGTH(FEET) =   350.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.13
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.89
  PIPE TRAVEL TIME(MIN.) =   1.14    Tc(MIN.) =    9.77
  LONGEST FLOWPATH FROM NODE    294.60 TO NODE    294.10 =     530.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.10 TO NODE    294.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.77
  RAINFALL INTENSITY(INCH/HR) =   5.99
  TOTAL STREAM AREA(ACRES) =     0.99
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.89

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.36    11.08        5.519          1.23
      2        2.89     9.77        5.986          0.99

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        5.85     9.77       5.986
      2        6.02    11.08       5.519

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.02   Tc(MIN.) =   11.08
  TOTAL AREA(ACRES) =        2.2
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    294.10 =     955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.10 TO NODE    294.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1223.00  DOWNSTREAM(FEET) =  1204.00
  FLOW LENGTH(FEET) =   750.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.36
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.02
  PIPE TRAVEL TIME(MIN.) =   1.49    Tc(MIN.) =   12.58
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    294.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    294.00 TO NODE    294.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        6.02    12.58       5.087        2.22
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    294.00 =    1705.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.75     9.70       6.014        2.82
  LONGEST FLOWPATH FROM NODE    297.00 TO NODE    294.00 =     680.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      12.40       9.70        6.014
      2      12.58      12.58        5.087

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.58   Tc(MIN.) =   12.58
  TOTAL AREA(ACRES) =        5.0

****************************************************************************
  FLOW PROCESS FROM NODE    294.00 TO NODE    294.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    294.00 TO NODE    293.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1204.00  DOWNSTREAM(FEET) =  1200.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.17
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.58
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   12.82
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    293.50 =    1855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    293.50 TO NODE    293.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1199.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   100.00   CHANNEL SLOPE =  0.0100
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.903
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.40
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   0.49
  Tc(MIN.) =   13.31
  SUBAREA AREA(ACRES) =     0.21       SUBAREA RUNOFF(CFS) =    0.46
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =      12.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   3.38
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    293.00 =    1955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    293.00 TO NODE    292.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1199.00  DOWNSTREAM(FEET) =  1196.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.92
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.58
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   13.37
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    292.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    292.00 TO NODE    292.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       12.58    13.37       4.889        5.25
  LONGEST FLOWPATH FROM NODE    294.90 TO NODE    292.00 =    2005.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       32.21    13.55       4.848       14.45
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE    292.00 =    2310.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      44.36      13.37        4.889
      2      44.68      13.55        4.848

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      44.68   Tc(MIN.) =   13.55
  TOTAL AREA(ACRES) =       19.7

****************************************************************************
  FLOW PROCESS FROM NODE    292.00 TO NODE    292.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    292.00 TO NODE    288.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1196.00  DOWNSTREAM(FEET) =  1189.00
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.9 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.53
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      44.68
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   13.88
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE    288.00 =    2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    288.00 TO NODE    288.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.88
  RAINFALL INTENSITY(INCH/HR) =   4.77
  TOTAL STREAM AREA(ACRES) =    19.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.68

****************************************************************************
  FLOW PROCESS FROM NODE    291.00 TO NODE    290.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1300.00
  DOWNSTREAM ELEVATION(FEET) =   1270.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.37
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
  FLOW PROCESS FROM NODE    290.00 TO NODE    289.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1270.00  DOWNSTREAM(FEET) =   1195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   840.00   CHANNEL SLOPE =  0.0893
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.37
  FLOW VELOCITY(FEET/SEC) =   4.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =   10.23
```

```
 LONGEST FLOWPATH FROM NODE    291.00 TO NODE    289.00 =     940.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    290.00 TO NODE    289.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.813
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    2.84   SUBAREA RUNOFF(CFS) =    4.13
 TOTAL AREA(ACRES) =        3.0   TOTAL RUNOFF(CFS) =       4.42
 TC(MIN.) =   10.23

****************************************************************************
 FLOW PROCESS FROM NODE    289.00 TO NODE    288.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1189.00  DOWNSTREAM(FEET) =  1187.00
 FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.81
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.42
 PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =   10.71
 LONGEST FLOWPATH FROM NODE    291.00 TO NODE    288.00 =    1110.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    288.00 TO NODE    288.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.71
 RAINFALL INTENSITY(INCH/HR) =   5.64
 TOTAL STREAM AREA(ACRES) =     3.04
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.42

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

```
    1       44.68    13.88        4.773         19.70
    2        4.42    10.71        5.641          3.04

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       38.90    10.71       5.641
      2       48.41    13.88       4.773

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      48.41   Tc(MIN.) =   13.88
  TOTAL AREA(ACRES) =       22.7
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE    288.00 =    2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    288.00 TO NODE    287.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1187.00  DOWNSTREAM(FEET) =  1185.50
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.81
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.41
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =   14.47
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE    287.00 =    2855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    287.00 TO NODE    287.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       48.41    14.47       4.647       22.74
  LONGEST FLOWPATH FROM NODE   2622.00 TO NODE    287.00 =    2855.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      153.85    15.65       4.418       76.75
```

```
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE    287.00 =    4805.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     190.67      14.47        4.647
      2     199.88      15.65        4.418

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     199.88   Tc(MIN.) =   15.65
  TOTAL AREA(ACRES) =       99.5

****************************************************************************
  FLOW PROCESS FROM NODE    287.00 TO NODE    287.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    287.00 TO NODE    246.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1185.50  DOWNSTREAM(FEET) =  1178.00
  FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  41.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.09
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     199.88
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   16.15
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE    246.00 =    5285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    246.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  16.15   RAIN INTENSITY(INCH/HOUR) =  4.33
  TOTAL AREA(ACRES) =    99.50   TOTAL RUNOFF(CFS) =    138.38

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    246.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    286.00 TO NODE    285.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1218.00
  DOWNSTREAM ELEVATION(FEET) =   1216.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE    285.00 TO NODE    284.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1216.00  DOWNSTREAM ELEVATION(FEET) = 1203.00
  STREET LENGTH(FEET) =   380.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    9.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.25
  STREET FLOW TRAVEL TIME(MIN.) =   1.54   Tc(MIN.) =    9.25
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.200
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
```

```
  SUBAREA AREA(ACRES) =    2.74      SUBAREA RUNOFF(CFS) =    7.64
  TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =       8.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  12.41
  FLOW VELOCITY(FEET/SEC.) =  4.75   DEPTH*VELOCITY(FT*FT/SEC.) =   1.73
  LONGEST FLOWPATH FROM NODE    286.00 TO NODE    284.00 =     460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    284.00 TO NODE    259.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1197.00  DOWNSTREAM(FEET) =  1195.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.54
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.01
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =    9.71
  LONGEST FLOWPATH FROM NODE    286.00 TO NODE    259.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    259.00 TO NODE    259.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    283.00 TO NODE    282.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1268.00
  DOWNSTREAM ELEVATION(FEET) =   1266.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.592
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.044
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    282.00 TO NODE    281.00 IS CODE =  62
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1266.00  DOWNSTREAM ELEVATION(FEET) = 1262.00
  STREET LENGTH(FEET) =   220.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.69
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    7.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.68
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.71
  STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =    8.96
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.331
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.451
  SUBAREA AREA(ACRES) =    2.06      SUBAREA RUNOFF(CFS) =    5.87
  TOTAL AREA(ACRES) =        2.3        PEAK FLOW RATE(CFS) =       6.54

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.66
  FLOW VELOCITY(FEET/SEC.) =  3.03   DEPTH*VELOCITY(FT*FT/SEC.) =   0.94
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    281.00 =     300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    281.00 TO NODE    280.60 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1256.00  DOWNSTREAM(FEET) =  1241.00
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.38
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.54
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    9.35
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    280.60 =     570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    280.60 TO NODE    280.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.35
  RAINFALL INTENSITY(INCH/HR) =   6.16
  TOTAL STREAM AREA(ACRES) =     2.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.54

****************************************************************************
  FLOW PROCESS FROM NODE    280.90 TO NODE    280.80 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1269.00
  DOWNSTREAM ELEVATION(FEET) =   1266.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.736
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.609
  SUBAREA RUNOFF(CFS) =      0.55
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
  FLOW PROCESS FROM NODE    280.80 TO NODE    280.70 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1266.00  DOWNSTREAM ELEVATION(FEET) = 1248.00
  STREET LENGTH(FEET) =   300.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.41
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    4.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =    7.91
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.862
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    0.56      SUBAREA RUNOFF(CFS) =    1.73
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.22

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   5.91
  FLOW VELOCITY(FEET/SEC.) =  4.48   DEPTH*VELOCITY(FT*FT/SEC.) =   1.05
  LONGEST FLOWPATH FROM NODE    280.90 TO NODE    280.70 =     380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    280.70 TO NODE    280.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1242.00  DOWNSTREAM(FEET) =  1241.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.30
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.22
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.01
  LONGEST FLOWPATH FROM NODE    280.90 TO NODE    280.60 =     420.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    280.60 TO NODE    280.60 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.01
  RAINFALL INTENSITY(INCH/HR) =   6.80
  TOTAL STREAM AREA(ACRES) =     0.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.22

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.54     9.35        6.157          2.29
      2        2.22     8.01        6.803          0.72

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.82     8.01       6.803
      2        8.55     9.35       6.157

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.55   Tc(MIN.) =    9.35
  TOTAL AREA(ACRES) =        3.0
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    280.60 =     570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    280.60 TO NODE    277.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1241.00  DOWNSTREAM(FEET) =  1238.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.55
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.46
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    277.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    277.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.46
  RAINFALL INTENSITY(INCH/HR) =   6.11
  TOTAL STREAM AREA(ACRES) =     3.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.55

****************************************************************************
  FLOW PROCESS FROM NODE    280.00 TO NODE    279.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1257.00
  DOWNSTREAM ELEVATION(FEET) =   1255.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    279.00 TO NODE    278.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1255.00  DOWNSTREAM ELEVATION(FEET) = 1244.00
  STREET LENGTH(FEET) =   340.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.88
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =    9.34
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.162
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    2.58      SUBAREA RUNOFF(CFS) =    7.15
  TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =       7.82

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   9.16
  FLOW VELOCITY(FEET/SEC.) =  3.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    278.00 =     420.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    278.00 TO NODE    277.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1239.00  DOWNSTREAM(FEET) =  1238.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.18
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.82
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.44
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    277.00 =     470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    277.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.44
  RAINFALL INTENSITY(INCH/HR) =   6.12
  TOTAL STREAM AREA(ACRES) =     2.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.82

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.55     9.46        6.113          3.01
      2        7.82     9.44        6.119          2.82
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       16.36     9.44       6.119
      2       16.36     9.46       6.113

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.36   Tc(MIN.) =    9.46
  TOTAL AREA(ACRES) =        5.8
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    277.00 =     640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    275.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1238.00  DOWNSTREAM(FEET) =  1228.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.36
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    9.67
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    275.00 =     820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    275.00 TO NODE    275.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.67
  RAINFALL INTENSITY(INCH/HR) =   6.03
  TOTAL STREAM AREA(ACRES) =     5.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.36

****************************************************************************
  FLOW PROCESS FROM NODE    275.30 TO NODE    275.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1247.00
  DOWNSTREAM ELEVATION(FEET) =   1243.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.120
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.094
  SUBAREA RUNOFF(CFS) =      0.51
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.51

****************************************************************************
  FLOW PROCESS FROM NODE    275.20 TO NODE    275.10 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1243.00  DOWNSTREAM ELEVATION(FEET) = 1235.00
  STREET LENGTH(FEET) =   165.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.00
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.18
    HALFSTREET FLOOD WIDTH(FEET) =    3.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
  STREET FLOW TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =    6.84
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.531
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    0.29      SUBAREA RUNOFF(CFS) =    0.98
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       1.46

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.78
  FLOW VELOCITY(FEET/SEC.) =  3.87   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
```

```
 LONGEST FLOWPATH FROM NODE    275.30 TO NODE    275.10 =     245.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    275.10 TO NODE    275.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1229.00  DOWNSTREAM(FEET) =  1228.00
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.57
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.46
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    6.96
 LONGEST FLOWPATH FROM NODE    275.30 TO NODE    275.00 =     285.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    275.00 TO NODE    275.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.96
 RAINFALL INTENSITY(INCH/HR) =   7.45
 TOTAL STREAM AREA(ACRES) =     0.43
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.46

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       16.36     9.67        6.027          5.83
     2        1.46     6.96        7.448          0.43

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       14.70     6.96       7.448
     2       17.54     9.67       6.027

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      17.54   Tc(MIN.) =    9.67
```

```
  TOTAL AREA(ACRES) =        6.3
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    275.00 =     820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    275.00 TO NODE    293.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1228.00  DOWNSTREAM(FEET) =  1218.00
  FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.66
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.54
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =   10.14
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    293.20 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    293.20 TO NODE    293.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.14
  RAINFALL INTENSITY(INCH/HR) =   5.84
  TOTAL STREAM AREA(ACRES) =     6.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.54

****************************************************************************
  FLOW PROCESS FROM NODE    293.80 TO NODE    293.60 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1236.00
  DOWNSTREAM ELEVATION(FEET) =   1234.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    293.60 TO NODE    293.40 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1234.00  DOWNSTREAM ELEVATION(FEET) = 1224.00
 STREET LENGTH(FEET) =   390.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.94
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.29
   HALFSTREET FLOOD WIDTH(FEET) =    8.47
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
 STREET FLOW TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =    9.62
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.045
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
 SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    5.17
 TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       5.47

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  11.22
 FLOW VELOCITY(FEET/SEC.) =  3.89   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
 LONGEST FLOWPATH FROM NODE    293.80 TO NODE    293.40 =     470.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    293.40 TO NODE    293.20 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1219.00  DOWNSTREAM(FEET) =  1218.00
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.11
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.47
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.71
  LONGEST FLOWPATH FROM NODE    293.80 TO NODE    293.20 =     510.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    293.20 TO NODE    293.20 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.71
  RAINFALL INTENSITY(INCH/HR) =   6.01
  TOTAL STREAM AREA(ACRES) =     2.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       17.54    10.14        5.845          6.26
      2        5.47     9.71        6.012          2.01

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       22.52     9.71       6.012
      2       22.86    10.14       5.845

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.86   Tc(MIN.) =   10.14
  TOTAL AREA(ACRES) =        8.3
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    293.20 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    293.20 TO NODE    264.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1218.00  DOWNSTREAM(FEET) =  1216.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.35
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.86
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   10.19
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    264.00 =    1195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    264.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    272.00 TO NODE    271.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1246.00
  DOWNSTREAM ELEVATION(FEET) =   1244.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    271.00 TO NODE    270.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1244.00  DOWNSTREAM ELEVATION(FEET) = 1233.00
  STREET LENGTH(FEET) =   850.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.22
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   6.21   Tc(MIN.) =   13.92
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.765
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    2.74      SUBAREA RUNOFF(CFS) =    5.87
  TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =       6.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =  10.03
  FLOW VELOCITY(FEET/SEC.) =  2.61   DEPTH*VELOCITY(FT*FT/SEC.) =   0.83
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    270.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    270.00 TO NODE    265.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1227.00  DOWNSTREAM(FEET) =  1217.00
  FLOW LENGTH(FEET) =   560.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.35
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.03
  PIPE TRAVEL TIME(MIN.) =   1.27    Tc(MIN.) =   15.19
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    265.00 =    1490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    265.00 TO NODE    265.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.19
  RAINFALL INTENSITY(INCH/HR) =   4.50
  TOTAL STREAM AREA(ACRES) =     2.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.03
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    269.00 TO NODE    268.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1235.00
  DOWNSTREAM ELEVATION(FEET) =   1233.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE    268.00 TO NODE    265.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1233.00  DOWNSTREAM ELEVATION(FEET) = 1222.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.54
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
  STREET FLOW TRAVEL TIME(MIN.) =   3.06   Tc(MIN.) =   10.77
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.621
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
```

```
  SUBAREA AREA(ACRES) =    2.51      SUBAREA RUNOFF(CFS) =    6.35
  TOTAL AREA(ACRES) =        2.6        PEAK FLOW RATE(CFS) =       6.63

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   9.41
  FLOW VELOCITY(FEET/SEC.) =  3.21   DEPTH*VELOCITY(FT*FT/SEC.) =   0.98
  LONGEST FLOWPATH FROM NODE    269.00 TO NODE    265.00 =     600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    265.00 TO NODE    265.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.77
  RAINFALL INTENSITY(INCH/HR) =   5.62
  TOTAL STREAM AREA(ACRES) =     2.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.63

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.03    15.19        4.504          2.81
      2        6.63    10.77        5.621          2.62

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.90    10.77       5.621
      2       11.33    15.19       4.504

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.33   Tc(MIN.) =   15.19
  TOTAL AREA(ACRES) =        5.4
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    265.00 =    1490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    265.00 TO NODE    264.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1217.00  DOWNSTREAM(FEET) =  1216.00
```

```
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.67
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.33
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   15.34
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    264.00 =    1560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    264.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       11.33    15.34       4.475        5.43
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    264.00 =    1560.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       22.86    10.19       5.825        8.27
  LONGEST FLOWPATH FROM NODE    283.00 TO NODE    264.00 =    1195.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      30.39      10.19        5.825
      2      28.89      15.34        4.475

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.39   Tc(MIN.) =   10.19
  TOTAL AREA(ACRES) =       13.7

****************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    264.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    260.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1216.00  DOWNSTREAM(FEET) =  1201.00
  FLOW LENGTH(FEET) =   515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.03
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.39
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   10.85
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    260.40 =    2075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.40 TO NODE    260.40 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.85
  RAINFALL INTENSITY(INCH/HR) =   5.59
  TOTAL STREAM AREA(ACRES) =    13.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.39

****************************************************************************
  FLOW PROCESS FROM NODE    260.70 TO NODE    260.60 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1230.00
  DOWNSTREAM ELEVATION(FEET) =   1228.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.25

****************************************************************************
  FLOW PROCESS FROM NODE    260.60 TO NODE    260.50 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1228.00  DOWNSTREAM ELEVATION(FEET) = 1207.00
  STREET LENGTH(FEET) =   740.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.42
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.22
  STREET FLOW TRAVEL TIME(MIN.) =   3.19   Tc(MIN.) =   10.90
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.579
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    3.29      SUBAREA RUNOFF(CFS) =    8.26
  TOTAL AREA(ACRES) =        3.4        PEAK FLOW RATE(CFS) =       8.46

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  13.22
  FLOW VELOCITY(FEET/SEC.) =  4.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.70
  LONGEST FLOWPATH FROM NODE    260.70 TO NODE    260.50 =     820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.50 TO NODE    260.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1202.00  DOWNSTREAM(FEET) =  1201.00
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.75
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.46
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   10.93
  LONGEST FLOWPATH FROM NODE    260.70 TO NODE    260.40 =     840.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.40 TO NODE    260.40 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.93
  RAINFALL INTENSITY(INCH/HR) =   5.57
  TOTAL STREAM AREA(ACRES) =     3.37
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       30.39    10.85        5.595         13.70
      2        8.46    10.93        5.569          3.37

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       38.79    10.85       5.595
      2       38.71    10.93       5.569

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      38.79   Tc(MIN.) =   10.85
  TOTAL AREA(ACRES) =       17.1
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    260.40 =    2075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.40 TO NODE    260.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1201.00  DOWNSTREAM(FEET) =  1186.00
  FLOW LENGTH(FEET) =   512.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.96
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.79
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =   11.46
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    260.00 =    2587.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE    260.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.46
  RAINFALL INTENSITY(INCH/HR) =   5.40
  TOTAL STREAM AREA(ACRES) =    17.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.79

****************************************************************************
  FLOW PROCESS FROM NODE    260.30 TO NODE    260.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1209.00
  DOWNSTREAM ELEVATION(FEET) =   1207.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE    260.20 TO NODE    260.10 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1207.00  DOWNSTREAM ELEVATION(FEET) = 1192.00
  STREET LENGTH(FEET) =   510.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.94
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
```

```
    HALFSTREET FLOOD WIDTH(FEET) =    8.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.57
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.00
  STREET FLOW TRAVEL TIME(MIN.) =   2.38   Tc(MIN.) =   10.09
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.864
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    1.91      SUBAREA RUNOFF(CFS) =    5.04
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       5.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.84
  FLOW VELOCITY(FEET/SEC.) =  4.07   DEPTH*VELOCITY(FT*FT/SEC.) =   1.35
  LONGEST FLOWPATH FROM NODE    260.30 TO NODE    260.10 =     590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.10 TO NODE    260.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1188.00  DOWNSTREAM(FEET) =  1187.50
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.44
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.38
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.14
  LONGEST FLOWPATH FROM NODE    260.30 TO NODE    260.00 =     615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE    260.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.14
  RAINFALL INTENSITY(INCH/HR) =   5.84
  TOTAL STREAM AREA(ACRES) =     2.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.38

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       38.79    11.46        5.400         17.07
      2        5.38    10.14        5.843          2.04

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       41.24    10.14       5.843
      2       43.76    11.46       5.400

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      43.76   Tc(MIN.) =   11.46
  TOTAL AREA(ACRES) =       19.1
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    260.00 =    2587.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE    259.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1187.50  DOWNSTREAM(FEET) =  1186.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.80
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.76
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   11.70
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    259.00 =    2727.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    259.00 TO NODE    259.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       43.76    11.70       5.329       19.11
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    259.00 =    2727.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
```

```
     1        8.01     9.71       6.010        2.87
  LONGEST FLOWPATH FROM NODE    286.00 TO NODE    259.00 =     640.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      44.33       9.71        6.010
      2      50.86      11.70        5.329

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      50.86   Tc(MIN.) =   11.70
  TOTAL AREA(ACRES) =       22.0

****************************************************************************
  FLOW PROCESS FROM NODE    259.00 TO NODE    259.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    259.00 TO NODE    258.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1186.00  DOWNSTREAM(FEET) =  1184.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.70
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.86
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   11.95
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    258.00 =    2887.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    258.00 TO NODE    246.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1184.00  DOWNSTREAM(FEET) =   1172.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0400
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.092
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.26
  AVERAGE FLOW DEPTH(FEET) =   1.18   TRAVEL TIME(MIN.) =   0.61
  Tc(MIN.) =   12.55
  SUBAREA AREA(ACRES) =     1.93       SUBAREA RUNOFF(CFS) =    2.46
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.434
  TOTAL AREA(ACRES) =       23.9         PEAK FLOW RATE(CFS) =      52.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   8.30
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    246.00 =    3187.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    246.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    257.00 TO NODE    256.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1205.00
  DOWNSTREAM ELEVATION(FEET) =   1203.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE    256.00 TO NODE    255.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1203.00  DOWNSTREAM ELEVATION(FEET) = 1185.00
  STREET LENGTH(FEET) =   670.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.42
  STREET FLOW TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =   10.45
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.730
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    4.27      SUBAREA RUNOFF(CFS) =   11.01
  TOTAL AREA(ACRES) =        4.4        PEAK FLOW RATE(CFS) =      11.45

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  15.09
  FLOW VELOCITY(FEET/SEC.) =  4.72   DEPTH*VELOCITY(FT*FT/SEC.) =   1.97
  LONGEST FLOWPATH FROM NODE    257.00 TO NODE    255.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    255.00 TO NODE    248.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1179.00  DOWNSTREAM(FEET) =  1175.00
  FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.21
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.45
  PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =   11.28
  LONGEST FLOWPATH FROM NODE    257.00 TO NODE    248.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    248.00 TO NODE    248.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   11.28
  RAINFALL INTENSITY(INCH/HR) =   5.46
  TOTAL STREAM AREA(ACRES) =     4.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.45

****************************************************************************
  FLOW PROCESS FROM NODE    254.00 TO NODE    253.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1188.00
  DOWNSTREAM ELEVATION(FEET) =   1186.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    253.00 TO NODE    248.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1186.00  DOWNSTREAM ELEVATION(FEET) = 1181.00
  STREET LENGTH(FEET) =   330.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   11.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
  STREET FLOW TRAVEL TIME(MIN.) =   1.84   Tc(MIN.) =    9.55
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.074
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
 SUBAREA AREA(ACRES) =    2.82      SUBAREA RUNOFF(CFS) =    7.71
 TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =       8.04

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.72
 FLOW VELOCITY(FEET/SEC.) =  3.47   DEPTH*VELOCITY(FT*FT/SEC.) =   1.43
 LONGEST FLOWPATH FROM NODE    254.00 TO NODE    248.00 =     410.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    248.00 TO NODE    248.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.55
 RAINFALL INTENSITY(INCH/HR) =   6.07
 TOTAL STREAM AREA(ACRES) =     2.94
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.04

****************************************************************************
 FLOW PROCESS FROM NODE    251.00 TO NODE    250.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
 UPSTREAM ELEVATION(FEET) =   1203.00
 DOWNSTREAM ELEVATION(FEET) =   1201.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.711
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.974
 SUBAREA RUNOFF(CFS) =      0.28
 TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
 FLOW PROCESS FROM NODE    250.00 TO NODE    248.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
```

```
  UPSTREAM ELEVATION(FEET) = 1201.00  DOWNSTREAM ELEVATION(FEET) = 1181.00
  STREET LENGTH(FEET) =   890.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.19
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   14.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.17
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.68
  STREET FLOW TRAVEL TIME(MIN.) =   3.56   Tc(MIN.) =   11.27
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.459
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  SUBAREA AREA(ACRES) =    7.17      SUBAREA RUNOFF(CFS) =   17.61
  TOTAL AREA(ACRES) =        7.3        PEAK FLOW RATE(CFS) =      17.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.79   DEPTH*VELOCITY(FT*FT/SEC.) =   2.28
  LONGEST FLOWPATH FROM NODE    251.00 TO NODE    248.00 =     970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    248.00 TO NODE    248.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.27
  RAINFALL INTENSITY(INCH/HR) =   5.46
  TOTAL STREAM AREA(ACRES) =     7.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.84

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.45    11.28        5.458          4.44
      2        8.04     9.55        6.074          2.94
      3       17.84    11.27        5.459          7.26

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       32.85     9.55       6.074
      2       36.50    11.27       5.459
      3       36.50    11.28       5.458

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      36.50   Tc(MIN.) =   11.27
  TOTAL AREA(ACRES) =       14.6
  LONGEST FLOWPATH FROM NODE    257.00 TO NODE    248.00 =    1105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    248.00 TO NODE    246.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1175.00  DOWNSTREAM(FEET) =  1172.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.79
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      36.50
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   11.48
  LONGEST FLOWPATH FROM NODE    257.00 TO NODE    246.00 =    1255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    246.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       36.50    11.48       5.394       14.64
  LONGEST FLOWPATH FROM NODE    257.00 TO NODE    246.00 =    1255.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       52.84    12.55       5.092       23.91
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    246.00 =    3187.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      84.83      11.48        5.394
      2      87.30      12.55        5.092

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      87.30   Tc(MIN.) =   12.55
  TOTAL AREA(ACRES) =       38.5

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    246.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  12.55   RAIN INTENSITY(INCH/HOUR) =  5.09
  TOTAL AREA(ACRES) =    38.50   TOTAL RUNOFF(CFS) =      7.40

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    246.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.40    12.55       5.093       38.50
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    246.00 =    3187.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      138.38    16.15       4.329       99.50
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE    246.00 =    5285.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     114.93      12.55        5.093
      2     144.67      16.15        4.329
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     144.67   Tc(MIN.) =   16.15
  TOTAL AREA(ACRES) =      138.0

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    245.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1175.00  DOWNSTREAM(FEET) =  1170.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.38
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     144.67
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   16.71
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE    245.50 =    5735.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    245.50 TO NODE    245.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1170.00  DOWNSTREAM(FEET) =  1098.00
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  52.87
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     144.67
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   16.76
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE    245.00 =    5905.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    245.00 TO NODE     26.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1098.00  DOWNSTREAM(FEET) =    970.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1180.00   CHANNEL SLOPE =  0.1085
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1064 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     144.67
  FLOW VELOCITY(FEET/SEC) =   9.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =   18.82
  LONGEST FLOWPATH FROM NODE   2696.00 TO NODE     26.00 =    7085.00 FEET.
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    245.00 TO NODE     26.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.922
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2439
  SUBAREA AREA(ACRES) =   39.89   SUBAREA RUNOFF(CFS) =   39.11
  TOTAL AREA(ACRES) =      177.9   TOTAL RUNOFF(CFS) =     170.19
  TC(MIN.) =   18.82
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      177.9  TC(MIN.) =     18.82
  PEAK FLOW RATE(CFS)   =     170.19
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-27d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2799	2798	2	1498.6	1495.6	95	0.52	0.27				
2798	2797	6	1495.6	1469	525	0.52	2.32	One side			
2797	2794	3	1463	1442	420						
2794	2794	1						1 of 2			
2796	2795	2	1474.8	1471.8	95	0.52	0.25				
2795	2794	6	1471.8	1448	380	0.52	1.88	One side			
2794	2794	1						2 of 2			
2794	2791	3	1442	1427	195						
2791	2791	1						1 of 2			
2793	2792	2	1451	1448	95	0.52	0.24				
2792	2791	6	1448	1433	195	0.52	1.58	One side			
2791	2791	1						2 of 2			
2791	2788	3	1427	1408	400						
2788	2788	1						1 of 2			
2790	2789	2	1436	1434	80	0.52	0.19				
2789	2788	6	1434	1414	325	0.48	2.58	One side			
2788	2788	1						2 of 2			
2788	2787	3	1408	1384							
2787	2787	10						Save to bank 1			
2785.5	2785	2	1605	1585	90	0.35	0.11				
2785	2780	5	1585	1432	1200						
2785	2780	8				0.35	4.19				
2780	2780	1						1 of 2			
2784	2783	2	1605	1592	100	0.35	0.25				
2783	2780	5	1592	1432	1200						
2783	2780	8				0.35	2.18				
2780	2780	1						2 of 2			
2780	2779	3	1426	1396	50						
2779	2779	1						1 of 2			
2779.4	2779.2	2	1494	1491	95	0.35	0.38				
2779.2	2779	5	1491	1403	1265						
2779.2	2779	8				0.35	1.67				
2779	2779	1						2 of 2			

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Newland Sierra

Job #: 2660-02

Run Name:
P-27d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2779	2787	3	1397	1384	685						
2787	2787	1						1 of 2			
2787.4	2787.2	2	1405	1400	65	0.35	0.30				
2787.2	2787	5	1405	1390	155						
2787.2	2787	8				0.28	1.79				
2787	2787	1						2 of 2			
2787	2787	11						Add bank 1			
2787	2787	12						Clear bank 1			
2787	2787	7	Tc=10.16 A=20.2 Q=14.33								
2787	2786	3	1384	1350	200						
2786	2783	5	1350	1300	400						
2786	2783	8				0.25	3.89				
2783	2783	1						1 of 2			
2783.4	2783.2	2	1745	1730	90	0.3	0.29				
2783.2	2783	5	1730	1300	1275						
2783.2	2783	8				0.34	14.91				
2783	2783	1						2 of 2			
2783	2782	5	1300	1135	1410						
2783	2782	8				0.3	28.13				
2782	2777	5	1135	1040	670						
2782	2777	8				0.25	8.96				
2777	2777	1						1 of 2			
2781	2780	2	1445	1435	75	0.25	0.14				
2780	2779	5	1435	1395	300						
2780	2779	8				0.25	1.76				
2779	2778	5	1395	1305	585						
2779	2778	8				0.25	5.55				
2778	2777	5	1305	1040	1335						
2778	2777	8				0.25	16.86				
2777	2777	1						2 of 2			
2777	2776	5	1040	970	1200						
2777	2776	8				0.28	21.24				
2776	2772	5	970	930	930						
2776	2772	8				0.29	16.81				
2772	2772	1						1 of 2			
2775	2774	2	1155	1140	75	0.25	0.16				
2774	2773	5	1140	1035	440						
2774	2773	8				0.25	14.38				

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Newland Sierra

Job #: 2660-02

Run Name:
P-27d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2773	2772	5	1035	930	990						
2773	2772	8				0.26	14.24				
2772	2772	1						2 of 2			
2772	27	5	930	920	385						
2772	27	8				0.33	3.57				
27	27	10						Save to bank 1			
2771	2770	2	1450	1445	90	0.25	0.35				
2770	2769	5	1445	1390	305						
2770	2769	8				0.25	1.97				
2769	2765	5	1390	1170	820						
2769	2765	8				0.25	8.79				
2765	2765	1						1 of 2			
2768	2767	2	1300	1295	75	0.25	0.31				
2767	2766	5	1295	1230	430						
2767	2766	8				0.25	5.63				
2766	2765	5	1230	1170	650						
2766	2765	8				0.25	15.49				
2765	2765	1						2 of 2			
2765	2711	5	1170	1105	600						
2765	2711	8				0.25	11.00				
2711	27	5	1105	920	1460						
2711	27	5				0.26	18.20				
27	27	11						Add bank 1			
							232.81				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                     *
* DETENTION AT NODE 2787                                                 *
* JANUARY 2017                                                           *
 ************************************************************************

  FILE NAME: P-27D.DAT
  TIME/DATE OF STUDY: 14:39 01/26/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2799.00 TO NODE   2798.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1498.60
  DOWNSTREAM ELEVATION(FEET) =   1495.60
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.936
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.467
  SUBAREA RUNOFF(CFS) =      1.05
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      1.05

****************************************************************************
  FLOW PROCESS FROM NODE   2798.00 TO NODE   2797.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1495.60  DOWNSTREAM ELEVATION(FEET) = 1469.00
  STREET LENGTH(FEET) =   525.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.95
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.55
  STREET FLOW TRAVEL TIME(MIN.) =   1.78   Tc(MIN.) =    8.72
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.442
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    2.32      SUBAREA RUNOFF(CFS) =    7.77
  TOTAL AREA(ACRES) =        2.6        PEAK FLOW RATE(CFS) =       8.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  11.97
  FLOW VELOCITY(FEET/SEC.) =  5.60   DEPTH*VELOCITY(FT*FT/SEC.) =   2.05
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2797.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2797.00 TO NODE   2794.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1463.00  DOWNSTREAM(FEET) =  1442.00
  FLOW LENGTH(FEET) =   420.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.83
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.68
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    9.31
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2794.00 =    1040.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2794.00 TO NODE   2794.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.31
  RAINFALL INTENSITY(INCH/HR) =   6.18
  TOTAL STREAM AREA(ACRES) =     2.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.68

****************************************************************************
  FLOW PROCESS FROM NODE   2796.00 TO NODE   2795.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1474.80
  DOWNSTREAM ELEVATION(FEET) =   1471.80
```

```
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.936
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.467
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE   2795.00 TO NODE   2794.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1471.80  DOWNSTREAM ELEVATION(FEET) = 1448.00
  STREET LENGTH(FEET) =   380.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.26
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.51
  STREET FLOW TRAVEL TIME(MIN.) =   1.23   Tc(MIN.) =    8.17
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.718
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    1.88      SUBAREA RUNOFF(CFS) =    6.57
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       7.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.72
  FLOW VELOCITY(FEET/SEC.) =  5.87   DEPTH*VELOCITY(FT*FT/SEC.) =   2.00
  LONGEST FLOWPATH FROM NODE   2796.00 TO NODE   2794.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2794.00 TO NODE   2794.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.17
  RAINFALL INTENSITY(INCH/HR) =   6.72
  TOTAL STREAM AREA(ACRES) =     2.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.44

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.68     9.31        6.175          2.59
      2        7.44     8.17        6.718          2.13

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.05     8.17       6.718
      2       15.52     9.31       6.175

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.52   Tc(MIN.) =    9.31
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2794.00 =    1040.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2794.00 TO NODE   2791.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1442.00  DOWNSTREAM(FEET) =  1427.00
  FLOW LENGTH(FEET) =   195.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.09
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.52
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    9.51
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2791.00 =    1235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2791.00 TO NODE   2791.00 IS CODE =   1
```

```
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.51
  RAINFALL INTENSITY(INCH/HR) =   6.09
  TOTAL STREAM AREA(ACRES) =     4.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.52

************************************************************************
  FLOW PROCESS FROM NODE   2793.00 TO NODE   2792.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1451.00
  DOWNSTREAM ELEVATION(FEET) =   1448.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.936
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.467
  SUBAREA RUNOFF(CFS) =      0.93
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.93

************************************************************************
  FLOW PROCESS FROM NODE   2792.00 TO NODE   2791.00 IS CODE =  62
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1448.00  DOWNSTREAM ELEVATION(FEET) = 1433.00
  STREET LENGTH(FEET) =   195.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.53
  STREET FLOW TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =    7.53
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.081
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    1.58      SUBAREA RUNOFF(CFS) =    5.82
  TOTAL AREA(ACRES) =        1.8        PEAK FLOW RATE(CFS) =       6.70

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.83
  FLOW VELOCITY(FEET/SEC.) =  6.18   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  LONGEST FLOWPATH FROM NODE   2793.00 TO NODE   2791.00 =     290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2791.00 TO NODE   2791.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.53
  RAINFALL INTENSITY(INCH/HR) =   7.08
  TOTAL STREAM AREA(ACRES) =     1.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       15.52     9.51        6.090          4.72
      2        6.70     7.53        7.081          1.82

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       20.05     7.53       7.081
      2       21.28     9.51       6.090

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.28   Tc(MIN.) =    9.51
```

```
  TOTAL AREA(ACRES) =        6.5
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2791.00 =    1235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2791.00 TO NODE   2788.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1427.00  DOWNSTREAM(FEET) =  1408.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.01
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      21.28
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =    9.99
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2788.00 =    1635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2788.00 TO NODE   2788.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.99
  RAINFALL INTENSITY(INCH/HR) =   5.90
  TOTAL STREAM AREA(ACRES) =     6.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.28

****************************************************************************
  FLOW PROCESS FROM NODE   2790.00 TO NODE   2789.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1436.00
  DOWNSTREAM ELEVATION(FEET) =   1434.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.880
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.506
  SUBAREA RUNOFF(CFS) =      0.74
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.74

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2789.00 TO NODE   2788.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1434.00  DOWNSTREAM ELEVATION(FEET) = 1414.00
 STREET LENGTH(FEET) =   325.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.31
   HALFSTREET FLOOD WIDTH(FEET) =    9.10
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.63
 STREET FLOW TRAVEL TIME(MIN.) =   1.03   Tc(MIN.) =    7.91
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.862
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.483
 SUBAREA AREA(ACRES) =    2.58      SUBAREA RUNOFF(CFS) =    8.50
 TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =       9.18

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.78
 FLOW VELOCITY(FEET/SEC.) =  6.09   DEPTH*VELOCITY(FT*FT/SEC.) =   2.20
 LONGEST FLOWPATH FROM NODE   2790.00 TO NODE   2788.00 =     405.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2788.00 TO NODE   2788.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.91
 RAINFALL INTENSITY(INCH/HR) =   6.86
```

```
  TOTAL STREAM AREA(ACRES) =     2.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       21.28     9.99        5.901          6.54
      2        9.18     7.91        6.862          2.77

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       27.48     7.91       6.862
      2       29.17     9.99       5.901

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      29.17   Tc(MIN.) =    9.99
  TOTAL AREA(ACRES) =        9.3
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2788.00 =    1635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2788.00 TO NODE   2787.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1408.00  DOWNSTREAM(FEET) =  1384.00
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.25
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.17
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   10.16
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2787.00 =    1850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2787.00 TO NODE   2787.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2785.50 TO NODE   2785.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1605.00
  DOWNSTREAM ELEVATION(FEET) =   1585.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.945
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.247
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE   2785.00 TO NODE   2780.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1585.00  DOWNSTREAM(FEET) =   1432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1200.00   CHANNEL SLOPE =  0.1275
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1200 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.32
  FLOW VELOCITY(FEET/SEC) =   1.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  10.31   Tc(MIN.) =   16.25
  LONGEST FLOWPATH FROM NODE   2785.50 TO NODE   2780.00 =    1290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2785.00 TO NODE   2780.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.311
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    4.19   SUBAREA RUNOFF(CFS) =    6.32
  TOTAL AREA(ACRES) =        4.3   TOTAL RUNOFF(CFS) =       6.49
  TC(MIN.) =   16.25

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2780.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.25
  RAINFALL INTENSITY(INCH/HR) =   4.31
  TOTAL STREAM AREA(ACRES) =     4.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.49

****************************************************************************
  FLOW PROCESS FROM NODE   2784.00 TO NODE   2783.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1605.00
  DOWNSTREAM ELEVATION(FEET) =   1592.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.70

****************************************************************************
  FLOW PROCESS FROM NODE   2783.00 TO NODE   2780.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1592.00  DOWNSTREAM(FEET) =   1432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1200.00   CHANNEL SLOPE =  0.1333
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1239 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.70
  FLOW VELOCITY(FEET/SEC) =   1.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  10.15   Tc(MIN.) =   16.41
  LONGEST FLOWPATH FROM NODE   2784.00 TO NODE   2780.00 =    1300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2783.00 TO NODE   2780.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.284
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    2.18   SUBAREA RUNOFF(CFS) =    3.27
  TOTAL AREA(ACRES) =        2.4   TOTAL RUNOFF(CFS) =       3.64
  TC(MIN.) =   16.41

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2780.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.41
  RAINFALL INTENSITY(INCH/HR) =   4.28
  TOTAL STREAM AREA(ACRES) =     2.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.64

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.49    16.25        4.311          4.30
      2        3.64    16.41        4.284          2.43

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       10.10    16.25       4.311
      2       10.09    16.41       4.284

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.10   Tc(MIN.) =   16.25
  TOTAL AREA(ACRES) =        6.7
  LONGEST FLOWPATH FROM NODE   2784.00 TO NODE   2780.00 =    1300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2779.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1426.00  DOWNSTREAM(FEET) =  1396.00
```

```
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.21
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.10
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   16.28
  LONGEST FLOWPATH FROM NODE   2784.00 TO NODE   2779.00 =    1350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2779.00 TO NODE   2779.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.28
  RAINFALL INTENSITY(INCH/HR) =   4.31
  TOTAL STREAM AREA(ACRES) =     6.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.10

****************************************************************************
  FLOW PROCESS FROM NODE   2779.40 TO NODE   2779.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1494.00
  DOWNSTREAM ELEVATION(FEET) =   1491.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.969
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.326
  SUBAREA RUNOFF(CFS) =      0.84
  TOTAL AREA(ACRES) =      0.38   TOTAL RUNOFF(CFS) =      0.84

****************************************************************************
  FLOW PROCESS FROM NODE   2779.20 TO NODE   2779.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1491.00  DOWNSTREAM(FEET) =   1403.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1265.00   CHANNEL SLOPE =  0.0696
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0696 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.84
  FLOW VELOCITY(FEET/SEC) =   1.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  14.27   Tc(MIN.) =   23.24
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2779.00 =    1360.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2779.20 TO NODE   2779.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.423
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.67   SUBAREA RUNOFF(CFS) =    2.00
  TOTAL AREA(ACRES) =        2.0   TOTAL RUNOFF(CFS) =       2.46
  TC(MIN.) =   23.24

****************************************************************************
  FLOW PROCESS FROM NODE   2779.00 TO NODE   2779.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.24
  RAINFALL INTENSITY(INCH/HR) =   3.42
  TOTAL STREAM AREA(ACRES) =     2.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.10    16.28        4.306          6.73
      2        2.46    23.24        3.423          2.05

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.82    16.28       4.306
      2       10.48    23.24       3.423
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.82   Tc(MIN.) =   16.28
 TOTAL AREA(ACRES) =        8.8
 LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2779.00 =    1360.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2779.00 TO NODE   2787.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1397.00  DOWNSTREAM(FEET) =  1384.00
 FLOW LENGTH(FEET) =   685.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.74
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.82
 PIPE TRAVEL TIME(MIN.) =   1.31    Tc(MIN.) =   17.59
 LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2787.00 =    2045.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2787.00 TO NODE   2787.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   17.59
 RAINFALL INTENSITY(INCH/HR) =   4.10
 TOTAL STREAM AREA(ACRES) =     8.78
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.82

****************************************************************************
 FLOW PROCESS FROM NODE   2787.40 TO NODE   2787.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
 UPSTREAM ELEVATION(FEET) =   1405.00
 DOWNSTREAM ELEVATION(FEET) =   1400.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.514
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.658
 SUBAREA RUNOFF(CFS) =      0.91
 TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.91
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2787.20 TO NODE   2787.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1405.00  DOWNSTREAM(FEET) =   1390.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   155.00   CHANNEL SLOPE =  0.0968
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0968 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.91
  FLOW VELOCITY(FEET/SEC) =   1.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =    7.00
  LONGEST FLOWPATH FROM NODE   2787.40 TO NODE   2787.00 =     220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2787.20 TO NODE   2787.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.425
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2900
  SUBAREA AREA(ACRES) =    1.79   SUBAREA RUNOFF(CFS) =    3.72
  TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       4.50
  TC(MIN.) =    7.00

****************************************************************************
  FLOW PROCESS FROM NODE   2787.00 TO NODE   2787.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.00
  RAINFALL INTENSITY(INCH/HR) =   7.42
  TOTAL STREAM AREA(ACRES) =     2.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.50

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.82    17.59        4.097          8.78
```

```
    2        4.50     7.00        7.425          2.09

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.02     7.00       7.425
      2       14.30    17.59       4.097

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      14.30   Tc(MIN.) =   17.59
  TOTAL AREA(ACRES) =       10.9
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2787.00 =    2045.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2787.00 TO NODE   2787.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       14.30    17.59       4.097       10.87
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2787.00 =    2045.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       29.17    10.16       5.838        9.31
  LONGEST FLOWPATH FROM NODE   2799.00 TO NODE   2787.00 =    1850.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      37.43      10.16        5.838
      2      34.77      17.59        4.097

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      37.43   Tc(MIN.) =   10.16
  TOTAL AREA(ACRES) =       20.2

****************************************************************************
  FLOW PROCESS FROM NODE   2787.00 TO NODE   2787.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
```

```
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE   2787.00 TO NODE   2787.00 IS CODE =   7
--------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
==========================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.16   RAIN INTENSITY(INCH/HOUR) =  5.84
  TOTAL AREA(ACRES) =    20.20   TOTAL RUNOFF(CFS) =     11.00

**************************************************************************
  FLOW PROCESS FROM NODE   2787.00 TO NODE   2786.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1384.00  DOWNSTREAM(FEET) =  1350.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.70
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.00
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   10.33
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2786.00 =    2245.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2786.00 TO NODE   2783.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.1250
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1183 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      11.00
  FLOW VELOCITY(FEET/SEC) =   4.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =   11.89
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2783.00 =    2645.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2786.00 TO NODE   2783.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.275
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.1186
  SUBAREA AREA(ACRES) =    3.89   SUBAREA RUNOFF(CFS) =    5.13
  TOTAL AREA(ACRES) =       24.1   TOTAL RUNOFF(CFS) =      15.07
  TC(MIN.) =   11.89

****************************************************************************
  FLOW PROCESS FROM NODE   2783.00 TO NODE   2783.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.89
  RAINFALL INTENSITY(INCH/HR) =   5.28
  TOTAL STREAM AREA(ACRES) =    24.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.07

****************************************************************************
  FLOW PROCESS FROM NODE   2783.40 TO NODE   2783.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1745.00
  DOWNSTREAM ELEVATION(FEET) =   1730.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.341
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.911
  SUBAREA RUNOFF(CFS) =      0.69
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.69

****************************************************************************
  FLOW PROCESS FROM NODE   2783.20 TO NODE   2783.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1730.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1275.00   CHANNEL SLOPE =  0.3373
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2030 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.69
  FLOW VELOCITY(FEET/SEC) =   2.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.42   Tc(MIN.) =   14.76
  LONGEST FLOWPATH FROM NODE   2783.40 TO NODE   2783.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2783.20 TO NODE   2783.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.587
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3392
  SUBAREA AREA(ACRES) =   14.91   SUBAREA RUNOFF(CFS) =   23.25
  TOTAL AREA(ACRES) =       15.2   TOTAL RUNOFF(CFS) =      23.65
  TC(MIN.) =   14.76

****************************************************************************
  FLOW PROCESS FROM NODE   2783.00 TO NODE   2783.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.76
  RAINFALL INTENSITY(INCH/HR) =   4.59
  TOTAL STREAM AREA(ACRES) =    15.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.65

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       15.07    11.89        5.275         24.09
      2       23.65    14.76        4.587         15.20

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       34.11    11.89       5.275
      2       36.76    14.76       4.587
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      36.76   Tc(MIN.) =   14.76
  TOTAL AREA(ACRES) =       39.3
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2783.00 =    2645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2783.00 TO NODE   2782.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1410.00   CHANNEL SLOPE =  0.1170
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1128 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      36.76
  FLOW VELOCITY(FEET/SEC) =   6.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   18.53
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2782.00 =    4055.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2783.00 TO NODE   2782.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.962
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2440
  SUBAREA AREA(ACRES) =   28.13   SUBAREA RUNOFF(CFS) =   33.44
  TOTAL AREA(ACRES) =       67.4   TOTAL RUNOFF(CFS) =      65.19
  TC(MIN.) =   18.53

****************************************************************************
  FLOW PROCESS FROM NODE   2782.00 TO NODE   2777.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =   1040.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   670.00   CHANNEL SLOPE =  0.1418
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      65.19
  FLOW VELOCITY(FEET/SEC) =   8.10 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   19.90
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2777.00 =    4725.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2782.00 TO NODE   2777.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.783
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2447
  SUBAREA AREA(ACRES) =    8.96   SUBAREA RUNOFF(CFS) =    8.47
  TOTAL AREA(ACRES) =       76.4   TOTAL RUNOFF(CFS) =      70.71
  TC(MIN.) =   19.90

****************************************************************************
  FLOW PROCESS FROM NODE   2777.00 TO NODE   2777.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.90
  RAINFALL INTENSITY(INCH/HR) =   3.78
  TOTAL STREAM AREA(ACRES) =    76.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     70.71

****************************************************************************
  FLOW PROCESS FROM NODE   2781.00 TO NODE   2780.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1445.00
  DOWNSTREAM ELEVATION(FEET) =   1435.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2779.00 IS CODE =  53
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1435.00  DOWNSTREAM(FEET) =   1395.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1333
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1239 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.28
  FLOW VELOCITY(FEET/SEC) =   1.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.54   Tc(MIN.) =    8.69
  LONGEST FLOWPATH FROM NODE   2781.00 TO NODE   2779.00 =     375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2780.00 TO NODE   2779.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.457
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    1.76   SUBAREA RUNOFF(CFS) =    2.84
  TOTAL AREA(ACRES) =        1.9   TOTAL RUNOFF(CFS) =       3.07
  TC(MIN.) =    8.69

****************************************************************************
  FLOW PROCESS FROM NODE   2779.00 TO NODE   2778.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1305.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   585.00   CHANNEL SLOPE =  0.1538
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1369 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.07
  FLOW VELOCITY(FEET/SEC) =   3.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.24   Tc(MIN.) =   11.93
  LONGEST FLOWPATH FROM NODE   2781.00 TO NODE   2778.00 =     960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2779.00 TO NODE   2778.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.264
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    5.55   SUBAREA RUNOFF(CFS) =    7.30
  TOTAL AREA(ACRES) =        7.5   TOTAL RUNOFF(CFS) =       9.80
  TC(MIN.) =   11.93

****************************************************************************
  FLOW PROCESS FROM NODE   2778.00 TO NODE   2777.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =   1040.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1335.00   CHANNEL SLOPE =  0.1985
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1593 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       9.80
  FLOW VELOCITY(FEET/SEC) =   4.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.66   Tc(MIN.) =   16.58
  LONGEST FLOWPATH FROM NODE   2781.00 TO NODE   2777.00 =    2295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2778.00 TO NODE   2777.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.256
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   16.86   SUBAREA RUNOFF(CFS) =   17.94
  TOTAL AREA(ACRES) =       24.3   TOTAL RUNOFF(CFS) =      25.86
  TC(MIN.) =   16.58

****************************************************************************
  FLOW PROCESS FROM NODE   2777.00 TO NODE   2777.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.58
  RAINFALL INTENSITY(INCH/HR) =   4.26
  TOTAL STREAM AREA(ACRES) =    24.31
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.86

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       70.71    19.90        3.783         76.38
      2       25.86    16.58        4.256         24.31

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       88.72    16.58       4.256
      2       93.70    19.90       3.783

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      93.70   Tc(MIN.) =   19.90
  TOTAL AREA(ACRES) =      100.7
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2777.00 =    4725.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2777.00 TO NODE   2776.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1040.00  DOWNSTREAM(FEET) =    970.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1200.00   CHANNEL SLOPE =  0.0583
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0583 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      93.70
  FLOW VELOCITY(FEET/SEC) =   6.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.26   Tc(MIN.) =   23.17
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2776.00 =    5925.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2777.00 TO NODE   2776.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.430
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2519
  SUBAREA AREA(ACRES) =   21.24   SUBAREA RUNOFF(CFS) =   20.40
```

```
  TOTAL AREA(ACRES) =      121.9   TOTAL RUNOFF(CFS) =     105.37
  TC(MIN.) =   23.17

****************************************************************************
  FLOW PROCESS FROM NODE   2776.00 TO NODE   2772.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    970.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.0430
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0430 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     105.37
  FLOW VELOCITY(FEET/SEC) =   5.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.83   Tc(MIN.) =   26.00
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2772.00 =    6855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2776.00 TO NODE   2772.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.184
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2565
  SUBAREA AREA(ACRES) =   16.81   SUBAREA RUNOFF(CFS) =   15.52
  TOTAL AREA(ACRES) =      138.7   TOTAL RUNOFF(CFS) =     113.34
  TC(MIN.) =   26.00

****************************************************************************
  FLOW PROCESS FROM NODE   2772.00 TO NODE   2772.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.00
  RAINFALL INTENSITY(INCH/HR) =   3.18
  TOTAL STREAM AREA(ACRES) =   138.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    113.34

****************************************************************************
  FLOW PROCESS FROM NODE   2775.00 TO NODE   2774.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1155.00
  DOWNSTREAM ELEVATION(FEET) =   1140.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.151
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.068
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE   2774.00 TO NODE   2773.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =   1035.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.2386
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1762 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.32
  FLOW VELOCITY(FEET/SEC) =   2.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2773.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2774.00 TO NODE   2773.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.193
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   14.38   SUBAREA RUNOFF(CFS) =   22.26
  TOTAL AREA(ACRES) =       14.5   TOTAL RUNOFF(CFS) =      22.51
  TC(MIN.) =    9.27

****************************************************************************
  FLOW PROCESS FROM NODE   2773.00 TO NODE   2772.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   990.00   CHANNEL SLOPE =  0.1061
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1045 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      22.51
  FLOW VELOCITY(FEET/SEC) =   5.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.23   Tc(MIN.) =   12.50
  LONGEST FLOWPATH FROM NODE   2775.00 TO NODE   2772.00 =    1505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2773.00 TO NODE   2772.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.106
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2549
  SUBAREA AREA(ACRES) =   14.24   SUBAREA RUNOFF(CFS) =   18.91
  TOTAL AREA(ACRES) =       28.8   TOTAL RUNOFF(CFS) =      37.47
  TC(MIN.) =   12.50

****************************************************************************
  FLOW PROCESS FROM NODE   2772.00 TO NODE   2772.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.50
  RAINFALL INTENSITY(INCH/HR) =   5.11
  TOTAL STREAM AREA(ACRES) =    28.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      113.34    26.00        3.184        138.74
      2       37.47    12.50        5.106         28.78

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      108.15    12.50       5.106
      2      136.71    26.00       3.184

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     136.71   Tc(MIN.) =   26.00
  TOTAL AREA(ACRES) =      167.5
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE   2772.00 =    6855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2772.00 TO NODE     27.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    930.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00   CHANNEL SLOPE =  0.0260
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0260 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     136.71
  FLOW VELOCITY(FEET/SEC) =   4.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   27.38
  LONGEST FLOWPATH FROM NODE   2779.40 TO NODE     27.00 =    7240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2772.00 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.080
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2578
  SUBAREA AREA(ACRES) =    3.57   SUBAREA RUNOFF(CFS) =    3.63
  TOTAL AREA(ACRES) =      171.1   TOTAL RUNOFF(CFS) =     136.71
  TC(MIN.) =   27.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2771.00 TO NODE   2770.00 IS CODE =  21
```

```
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1450.00
  DOWNSTREAM ELEVATION(FEET) =   1445.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.196
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.705
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.35   TOTAL RUNOFF(CFS) =      0.59

************************************************************************
  FLOW PROCESS FROM NODE   2770.00 TO NODE   2769.00 IS CODE =  53
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1445.00  DOWNSTREAM(FEET) =   1390.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.1803
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1502 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.59
  FLOW VELOCITY(FEET/SEC) =   2.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.34   Tc(MIN.) =   10.54
  LONGEST FLOWPATH FROM NODE   2771.00 TO NODE   2769.00 =     395.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   2770.00 TO NODE   2769.00 IS CODE =  81
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.701
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    1.97   SUBAREA RUNOFF(CFS) =    2.81
  TOTAL AREA(ACRES) =        2.3   TOTAL RUNOFF(CFS) =       3.31
  TC(MIN.) =   10.54

************************************************************************
  FLOW PROCESS FROM NODE   2769.00 TO NODE   2765.00 IS CODE =  53
------------------------------------------------------------------------
```

```
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1390.00  DOWNSTREAM(FEET) =   1170.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   820.00   CHANNEL SLOPE =  0.2683
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1861 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.31
  FLOW VELOCITY(FEET/SEC) =   3.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.80   Tc(MIN.) =   14.34
  LONGEST FLOWPATH FROM NODE   2771.00 TO NODE   2765.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2769.00 TO NODE   2765.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.674
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    8.79   SUBAREA RUNOFF(CFS) =   10.27
  TOTAL AREA(ACRES) =       11.1   TOTAL RUNOFF(CFS) =      12.98
  TC(MIN.) =   14.34

****************************************************************************
  FLOW PROCESS FROM NODE   2765.00 TO NODE   2765.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.34
  RAINFALL INTENSITY(INCH/HR) =   4.67
  TOTAL STREAM AREA(ACRES) =    11.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.98

****************************************************************************
  FLOW PROCESS FROM NODE   2768.00 TO NODE   2767.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =   1300.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1295.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.041
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.395
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2767.00 TO NODE   2766.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1230.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.1512
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1356 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.57
  FLOW VELOCITY(FEET/SEC) =   2.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.48   Tc(MIN.) =   10.52
  LONGEST FLOWPATH FROM NODE   2768.00 TO NODE   2766.00 =     505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2767.00 TO NODE   2766.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.709
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    5.63   SUBAREA RUNOFF(CFS) =    8.04
  TOTAL AREA(ACRES) =        5.9   TOTAL RUNOFF(CFS) =       8.48
  TC(MIN.) =   10.52

****************************************************************************
  FLOW PROCESS FROM NODE   2766.00 TO NODE   2765.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1170.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.0923
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0923 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.48
```

```
 FLOW VELOCITY(FEET/SEC) =   3.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =   13.64
 LONGEST FLOWPATH FROM NODE   2768.00 TO NODE   2765.00 =    1155.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2766.00 TO NODE   2765.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.827
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =   15.49   SUBAREA RUNOFF(CFS) =   18.69
 TOTAL AREA(ACRES) =       21.4   TOTAL RUNOFF(CFS) =      25.86
 TC(MIN.) =   13.64

****************************************************************************
 FLOW PROCESS FROM NODE   2765.00 TO NODE   2765.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.64
 RAINFALL INTENSITY(INCH/HR) =   4.83
 TOTAL STREAM AREA(ACRES) =    21.43
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.86

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       12.98    14.34        4.674         11.11
     2       25.86    13.64        4.827         21.43

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       38.21    13.64       4.827
     2       38.03    14.34       4.674

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      38.21   Tc(MIN.) =   13.64
```

```
  TOTAL AREA(ACRES) =       32.5
  LONGEST FLOWPATH FROM NODE   2771.00 TO NODE   2765.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2765.00 TO NODE   2711.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1170.00  DOWNSTREAM(FEET) =   1105.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1083
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1063 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      38.21
  FLOW VELOCITY(FEET/SEC) =   6.14 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   15.27
  LONGEST FLOWPATH FROM NODE   2771.00 TO NODE   2711.00 =    1815.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2765.00 TO NODE   2711.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.488
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =   11.00   SUBAREA RUNOFF(CFS) =   12.34
  TOTAL AREA(ACRES) =       43.5   TOTAL RUNOFF(CFS) =      48.85
  TC(MIN.) =   15.27

****************************************************************************
  FLOW PROCESS FROM NODE   2711.00 TO NODE     27.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1460.00   CHANNEL SLOPE =  0.1267
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1195 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      48.85
  FLOW VELOCITY(FEET/SEC) =   7.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.44   Tc(MIN.) =   18.71
  LONGEST FLOWPATH FROM NODE   2771.00 TO NODE     27.00 =    3275.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2711.00 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.936
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2529
 SUBAREA AREA(ACRES) =   18.20   SUBAREA RUNOFF(CFS) =   18.63
 TOTAL AREA(ACRES) =       61.7   TOTAL RUNOFF(CFS) =      61.48
 TC(MIN.) =   18.71

****************************************************************************
 FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       61.48    18.71       3.936       61.74
 LONGEST FLOWPATH FROM NODE   2771.00 TO NODE     27.00 =    3275.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      136.71    27.38       3.080      171.09
 LONGEST FLOWPATH FROM NODE   2779.40 TO NODE     27.00 =    7240.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     154.92      18.71        3.936
     2     184.80      27.38        3.080

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     184.80   Tc(MIN.) =   27.38
 TOTAL AREA(ACRES) =      232.8
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      232.8  TC(MIN.) =     27.38
 PEAK FLOW RATE(CFS)   =     184.80
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Proposed Condition

BASIN D

THE FOLLOWING SUBBASINS OF MAJOR BASIN D
HAVE NO GRADING, THUS THERE IS NO CHANGE IN HYDROLOGY FOR
THE PROPOSED CONDITION.

30
31

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Newland Sierra

Job #: 2660-02

Run Name:
P-28d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2860	2859	2	1407	1395	60	0.9	0.05				
2859	2858	6	1395	1216	1068	0.89	0.81	2 sides			
2858	2857	3	1210	1140	400						
2857	2857	1						1 of 2			
2856	2855	2	1215	1198	90	0.88	0.07				
2855	2857	6	1198	1146	295	0.88	0.23	2 sides			
2857	2857	1						2 of 2			
2857	2854	3	1140	1080	410						
2854	2854	1						1 of 2			
2853	2852	2	1146	1133	90	0.88	0.07				
2852	2854	6	1133	1086	308	0.88	0.23	2 sides			
2854	2854	1						2 of 2			
2854	2851	3	1080	1019	328						
2851	2851	1						1 of 2			
2850	2849	2	1086	1070	92	0.88	0.07				
2849	2851	6	1070	1025	233	0.89	0.18	2 sides			
2851	2851	1						2 of 2			
2851	2848	3	1019	980	328						
2848	2828	5	980	979	15		*				
2828	2828	7	Tc=5.34 A=1.7 Q=1								
2828	2828	10						Save Bank 1			
2847	2846	2	1730	1695	100	0.35	0.33				
2846	2845	5	1695	1440	515						
2846	2845	8				0.35	3.06				
2845	2844	5	1440	1325	395						
2845	2844	8				0.33	9.88				
2844	2843	3	1325	1305	80						
2843	2843	1						1 of 2			
2842	2841	2	1395	1390	100	0.35	0.11				
2841	2840	5	1390	1345	253						
2841	2840	8				0.29	1.72				
2840	2839	3	1339	1329	37						
2839	2843	5	1335	1305	178		*				
2843	2843	1						2 of 2			
2843	2838	5	1305	1165	773						
2843	2838	8				0.25	6.24				
2838	2838	1						1 of 2			

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Newland Sierra

Job #: 2660-02

Run Name:
P-28d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2837	2836	2	1670	1640	95	0.35	0.14				
2836	2835	5	1640	1166	1224						
2836	2835	8				0.28	14.49				
2835	2838	3	1166	1160	50						
2838	2838	1						2 of 2			
2838	2838.5	5	1160	1115	340		*				
2838.5	2838.5	1						1 OF 2			
2834	2833	2	1380	1355	80	0.25	0.06				
2833	2838.5	5	1355	1115	665		*				
2838.5	2838.5	1						2 OF 2			
2838.5	2832	5	1115	996	720						
2838.5	2832	8				0.25	8.35				
2832	2832	1						1 OF 2			
2831	2830	2	1250	1205	100	0.25	0.18				
2830	2829	5	1205	1005	425						
2830	2829	8				0.32	7.31				
2829	2832	3	1005	995	56						
2832	2832	1						2 of 2			
2832	2828	3	995	979	73						
2828	2828	11						Add Bank 1			
2828	2828	12						Clear Bank 1			
2828	2827	3	979	946	358						
2827	2827	1						1 of 2			
2826	2825	2	1025	1012	95	0.88	0.07				
2825	2824	6	1012	960	394	0.88	0.37	2 Sides			
2824	2823	3	954	947	85						
2823	2827	5	947	946	26		*				
2823	2827	7	Tc=3.27 A=0.4 Q=0.1								
2827	2827	1						2 of 2			
2827	2822	3	946	945	15						
2822	28	5	945	925	112		*				
28	28	10						Save Bank 1			
2821	2820	2	1736	1707	100	0.35	0.28				
2820	2819	5	1707	1500	460						
2820	2819	8				0.35	3.50				
2819	2818	5	1500	1200	1130						
2819	2818	8				0.3	16.92				

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Newland Sierra

Job #: 2660-02

Run Name:
P-28d.dat

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2818	2817	5	1200	1070	890						
2818	2817	8				0.25	11.28				
2817	2816	5	1070	980	655						
2817	2816	8				0.29	5.72				
2816	2816	1						1 of 2			
2815	2814	2	1260	1235	100	0.25	0.30				
2814	2816	5	1235	980	1510						
2814	2816	8				0.29	15.71				
2816	2816	1						2 of 2			
2816	2813	3	980	956	75						
2813	28	5	965	925	375		*				
28	28	11						Add Bank 1			
							107.73				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED HYDROLOGY                                                    *
* SUBBASIN 28 WITH DETENTION AT NODE 2828                               *
* JANUARY 2017                                                          *
 ************************************************************************

  FILE NAME: P-28D.DAT
  TIME/DATE OF STUDY: 09:20 01/30/2017
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   18.0      8.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2860.00 TO NODE   2859.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1407.00
  DOWNSTREAM ELEVATION(FEET) =   1395.00
  ELEVATION DIFFERENCE(FEET) =     12.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.294
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE   2859.00 TO NODE   2858.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1395.00  DOWNSTREAM ELEVATION(FEET) = 1216.00
  STREET LENGTH(FEET) =  1068.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.74
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.06
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.37
  STREET FLOW TRAVEL TIME(MIN.) =   2.69   Tc(MIN.) =    3.99
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.891
  SUBAREA AREA(ACRES) =    0.81      SUBAREA RUNOFF(CFS) =    6.65
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       7.06

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.05
  FLOW VELOCITY(FEET/SEC.) =  7.30   DEPTH*VELOCITY(FT*FT/SEC.) =   1.80
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2858.00 =    1128.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2858.00 TO NODE   2857.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1210.00  DOWNSTREAM(FEET) =  1140.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.57
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.06
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    4.37
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2857.00 =    1528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2857.00 TO NODE   2857.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.37
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.06

****************************************************************************
  FLOW PROCESS FROM NODE   2856.00 TO NODE   2855.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1215.00
  DOWNSTREAM ELEVATION(FEET) =   1198.00
  ELEVATION DIFFERENCE(FEET) =     17.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.744
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2855.00 TO NODE   2857.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1198.00  DOWNSTREAM ELEVATION(FEET) = 1146.00
  STREET LENGTH(FEET) =   295.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.50
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.16
    HALFSTREET FLOOD WIDTH(FEET) =    1.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
  STREET FLOW TRAVEL TIME(MIN.) =   0.62   Tc(MIN.) =    2.36
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    0.23      SUBAREA RUNOFF(CFS) =    1.87
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       2.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.18   HALFSTREET FLOOD WIDTH(FEET) =   2.46
```

```
  FLOW VELOCITY(FEET/SEC.) =  6.81   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
  LONGEST FLOWPATH FROM NODE   2856.00 TO NODE   2857.00 =     385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2857.00 TO NODE   2857.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.36
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.43

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.06     4.37        9.222          0.86
      2        2.43     2.36        9.222          0.30

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.26     2.36       9.222
      2        9.50     4.37       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.50   Tc(MIN.) =    4.37
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2857.00 =    1528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2857.00 TO NODE   2854.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1140.00  DOWNSTREAM(FEET) =  1080.00
  FLOW LENGTH(FEET) =   410.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.91
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       9.50
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    4.75
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2854.00 =    1938.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2854.00 TO NODE   2854.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.75
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     1.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.50

****************************************************************************
  FLOW PROCESS FROM NODE   2853.00 TO NODE   2852.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1146.00
  DOWNSTREAM ELEVATION(FEET) =   1133.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.744
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2852.00 TO NODE   2854.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1133.00  DOWNSTREAM ELEVATION(FEET) = 1086.00
  STREET LENGTH(FEET) =   308.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.50
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.16
    HALFSTREET FLOOD WIDTH(FEET) =    1.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.15
  STREET FLOW TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =    2.44
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    0.23      SUBAREA RUNOFF(CFS) =    1.87
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       2.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.18   HALFSTREET FLOOD WIDTH(FEET) =   2.73
  FLOW VELOCITY(FEET/SEC.) =  6.32   DEPTH*VELOCITY(FT*FT/SEC.) =   1.14
  LONGEST FLOWPATH FROM NODE   2853.00 TO NODE   2854.00 =     398.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2854.00 TO NODE   2854.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.44
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.43

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.50     4.75        9.222          1.16
      2        2.43     2.44        9.222          0.30

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       11.93     2.44       9.222
      2       11.93     4.75       9.222

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.93   Tc(MIN.) =    4.75
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2854.00 =    1938.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2854.00 TO NODE   2851.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1080.00  DOWNSTREAM(FEET) =  1019.00
  FLOW LENGTH(FEET) =   328.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.81
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.93
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    5.01
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2851.00 =    2266.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2851.00 TO NODE   2851.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.01
  RAINFALL INTENSITY(INCH/HR) =   9.21
  TOTAL STREAM AREA(ACRES) =     1.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.93

****************************************************************************
  FLOW PROCESS FROM NODE   2850.00 TO NODE   2849.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    92.00
  UPSTREAM ELEVATION(FEET) =   1086.00
  DOWNSTREAM ELEVATION(FEET) =   1070.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.763
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2849.00 TO NODE   2851.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1070.00  DOWNSTREAM ELEVATION(FEET) = 1025.00
  STREET LENGTH(FEET) =   233.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.16
    HALFSTREET FLOOD WIDTH(FEET) =    1.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.30
  STREET FLOW TRAVEL TIME(MIN.) =   0.47   Tc(MIN.) =    2.23
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.887
  SUBAREA AREA(ACRES) =    0.18      SUBAREA RUNOFF(CFS) =    1.48
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       2.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.16   HALFSTREET FLOOD WIDTH(FEET) =   1.50
```

```
 FLOW VELOCITY(FEET/SEC.) =  8.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.30
 LONGEST FLOWPATH FROM NODE   2850.00 TO NODE   2851.00 =     325.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2851.00 TO NODE   2851.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    2.23
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     0.25
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.05

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       11.93     5.01        9.210          1.46
     2        2.05     2.23        9.222          0.25

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       13.96     2.23       9.222
     2       13.97     5.01       9.210

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      13.97   Tc(MIN.) =    5.01
 TOTAL AREA(ACRES) =        1.7
 LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2851.00 =    2266.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2851.00 TO NODE   2848.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1019.00  DOWNSTREAM(FEET) =   980.00
 FLOW LENGTH(FEET) =   328.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.45
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      13.97
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    5.31
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2848.00 =    2594.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2848.00 TO NODE   2828.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    980.00  DOWNSTREAM(FEET) =    979.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    15.00   CHANNEL SLOPE =  0.0667
  CHANNEL FLOW THRU SUBAREA(CFS) =      13.97
  FLOW VELOCITY(FEET/SEC) =   7.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    5.34
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2828.00 =    2609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2828.00 TO NODE   2828.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.30   RAIN INTENSITY(INCH/HOUR) =  8.88
  TOTAL AREA(ACRES) =     1.70   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE   2828.00 TO NODE   2828.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2847.00 TO NODE   2846.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1730.00
  DOWNSTREAM ELEVATION(FEET) =   1695.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.92
```

```
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      0.92

****************************************************************************
  FLOW PROCESS FROM NODE   2846.00 TO NODE   2845.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1695.00  DOWNSTREAM(FEET) =   1440.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.4951
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2245 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.92
  FLOW VELOCITY(FEET/SEC) =   2.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.23   Tc(MIN.) =    9.50
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2845.00 =     615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2846.00 TO NODE   2845.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.095
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    3.06   SUBAREA RUNOFF(CFS) =    6.53
  TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =       7.23
  TC(MIN.) =    9.50

****************************************************************************
  FLOW PROCESS FROM NODE   2845.00 TO NODE   2844.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.00   CHANNEL SLOPE =  0.2911
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1928 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.23
  FLOW VELOCITY(FEET/SEC) =   4.75 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.39   Tc(MIN.) =   10.89
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2844.00 =    1010.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2845.00 TO NODE   2844.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.583
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3300
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3351
 SUBAREA AREA(ACRES) =    9.88   SUBAREA RUNOFF(CFS) =   18.20
 TOTAL AREA(ACRES) =       13.3   TOTAL RUNOFF(CFS) =      24.83
 TC(MIN.) =   10.89

****************************************************************************
 FLOW PROCESS FROM NODE   2844.00 TO NODE   2843.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1325.00  DOWNSTREAM(FEET) =  1305.00
 FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  28.17
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      24.83
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   10.93
 LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2843.00 =    1090.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2843.00 TO NODE   2843.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.93
 RAINFALL INTENSITY(INCH/HR) =   5.57
 TOTAL STREAM AREA(ACRES) =    13.27
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.83

****************************************************************************
 FLOW PROCESS FROM NODE   2842.00 TO NODE   2841.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1395.00
  DOWNSTREAM ELEVATION(FEET) =   1390.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.868
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE   2841.00 TO NODE   2840.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1390.00  DOWNSTREAM(FEET) =   1345.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   253.00   CHANNEL SLOPE =  0.1779
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1489 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.26
  FLOW VELOCITY(FEET/SEC) =   2.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =    9.85
  LONGEST FLOWPATH FROM NODE   2842.00 TO NODE   2840.00 =     353.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2841.00 TO NODE   2840.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.956
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2936
  SUBAREA AREA(ACRES) =    1.72   SUBAREA RUNOFF(CFS) =    2.97
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =       3.20
  TC(MIN.) =    9.85

****************************************************************************
  FLOW PROCESS FROM NODE   2840.00 TO NODE   2839.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1339.00  DOWNSTREAM(FEET) =  1329.00
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
```

```
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.28
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.20
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    9.88
  LONGEST FLOWPATH FROM NODE   2842.00 TO NODE   2839.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2839.00 TO NODE   2843.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1335.00  DOWNSTREAM(FEET) =   1305.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   178.00   CHANNEL SLOPE =  0.1685
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1443 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.20
  FLOW VELOCITY(FEET/SEC) =   3.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.95   Tc(MIN.) =   10.83
  LONGEST FLOWPATH FROM NODE   2842.00 TO NODE   2843.00 =     568.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2843.00 TO NODE   2843.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.83
  RAINFALL INTENSITY(INCH/HR) =   5.60
  TOTAL STREAM AREA(ACRES) =     1.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.20

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       24.83    10.93        5.567         13.27
      2        3.20    10.83        5.601          1.83

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
```

```
      1       27.79    10.83       5.601
      2       28.01    10.93       5.567

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      28.01   Tc(MIN.) =   10.93
  TOTAL AREA(ACRES) =       15.1
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2843.00 =    1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2843.00 TO NODE   2838.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =   1165.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   773.00   CHANNEL SLOPE =  0.1811
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1506 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      28.01
  FLOW VELOCITY(FEET/SEC) =   6.59 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =   12.89
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2838.00 =    1863.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2843.00 TO NODE   2838.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.007
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3067
  SUBAREA AREA(ACRES) =    6.24   SUBAREA RUNOFF(CFS) =    7.81
  TOTAL AREA(ACRES) =       21.3   TOTAL RUNOFF(CFS) =      32.77
  TC(MIN.) =   12.89

****************************************************************************
  FLOW PROCESS FROM NODE   2838.00 TO NODE   2838.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.89
  RAINFALL INTENSITY(INCH/HR) =   5.01
  TOTAL STREAM AREA(ACRES) =    21.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.77
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2837.00 TO NODE   2836.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1670.00
  DOWNSTREAM ELEVATION(FEET) =   1640.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.108
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.105
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE   2836.00 TO NODE   2835.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1640.00  DOWNSTREAM(FEET) =   1166.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1224.00   CHANNEL SLOPE =  0.3873
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2118 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.40
  FLOW VELOCITY(FEET/SEC) =   2.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.92   Tc(MIN.) =   14.02
  LONGEST FLOWPATH FROM NODE   2837.00 TO NODE   2835.00 =    1319.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2836.00 TO NODE   2835.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.741
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2807
  SUBAREA AREA(ACRES) =   14.49   SUBAREA RUNOFF(CFS) =   19.24
  TOTAL AREA(ACRES) =       14.6   TOTAL RUNOFF(CFS) =      19.47
  TC(MIN.) =   14.02
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2835.00 TO NODE   2838.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1166.00  DOWNSTREAM(FEET) =  1160.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.12
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.47
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   14.07
  LONGEST FLOWPATH FROM NODE   2837.00 TO NODE   2838.00 =    1369.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2838.00 TO NODE   2838.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.07
  RAINFALL INTENSITY(INCH/HR) =   4.73
  TOTAL STREAM AREA(ACRES) =    14.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       32.77    12.89        5.007         21.34
      2       19.47    14.07        4.732         14.63

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       50.61    12.89       5.007
      2       50.44    14.07       4.732

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      50.61   Tc(MIN.) =   12.89
  TOTAL AREA(ACRES) =       36.0
```

```
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2838.00 =    1863.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2838.00 TO NODE   2838.50 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =   1115.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00   CHANNEL SLOPE =  0.1324
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1232 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      50.61
  FLOW VELOCITY(FEET/SEC) =   7.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.78   Tc(MIN.) =   13.67
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2838.50 =    2203.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2838.50 TO NODE   2838.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.67
  RAINFALL INTENSITY(INCH/HR) =   4.82
  TOTAL STREAM AREA(ACRES) =    35.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     50.61

****************************************************************************
  FLOW PROCESS FROM NODE   2834.00 TO NODE   2833.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1380.00
  DOWNSTREAM ELEVATION(FEET) =   1355.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.352
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.902
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2833.00 TO NODE   2838.50 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1355.00  DOWNSTREAM(FEET) =   1115.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   665.00   CHANNEL SLOPE =  0.3609
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2072 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
 FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.35   Tc(MIN.) =   10.70
 LONGEST FLOWPATH FROM NODE   2834.00 TO NODE   2838.50 =     745.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2838.50 TO NODE   2838.50 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.70
 RAINFALL INTENSITY(INCH/HR) =   5.65
 TOTAL STREAM AREA(ACRES) =     0.06
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.12

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       50.61    13.67        4.820         35.97
     2        0.12    10.70        5.645          0.06

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       43.33    10.70       5.645
     2       50.71    13.67       4.820

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      50.71   Tc(MIN.) =   13.67
 TOTAL AREA(ACRES) =       36.0
 LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2838.50 =    2203.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2838.50 TO NODE   2832.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.00  DOWNSTREAM(FEET) =    996.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   720.00   CHANNEL SLOPE =  0.1653
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1426 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      50.71
  FLOW VELOCITY(FEET/SEC) =   7.82 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.53   Tc(MIN.) =   15.20
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2832.00 =    2923.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2838.50 TO NODE   2832.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.501
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2874
  SUBAREA AREA(ACRES) =    8.35   SUBAREA RUNOFF(CFS) =    9.40
  TOTAL AREA(ACRES) =       44.4   TOTAL RUNOFF(CFS) =      57.40
  TC(MIN.) =   15.20

****************************************************************************
  FLOW PROCESS FROM NODE   2832.00 TO NODE   2832.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.20
  RAINFALL INTENSITY(INCH/HR) =   4.50
  TOTAL STREAM AREA(ACRES) =    44.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     57.40

****************************************************************************
  FLOW PROCESS FROM NODE   2831.00 TO NODE   2830.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1250.00
  DOWNSTREAM ELEVATION(FEET) =   1205.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE   2830.00 TO NODE   2829.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1205.00  DOWNSTREAM(FEET) =   1005.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   425.00   CHANNEL SLOPE =  0.4706
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2221 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.33
  FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.68   Tc(MIN.) =    9.79
  LONGEST FLOWPATH FROM NODE   2831.00 TO NODE   2829.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2830.00 TO NODE   2829.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.980
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3183
  SUBAREA AREA(ACRES) =    7.31   SUBAREA RUNOFF(CFS) =   13.99
  TOTAL AREA(ACRES) =        7.5   TOTAL RUNOFF(CFS) =      14.26
  TC(MIN.) =    9.79

****************************************************************************
  FLOW PROCESS FROM NODE   2829.00 TO NODE   2832.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1005.00  DOWNSTREAM(FEET) =   995.00
```

```
 FLOW LENGTH(FEET) =    56.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.52
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      14.26
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    9.83
 LONGEST FLOWPATH FROM NODE   2831.00 TO NODE   2832.00 =     581.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2832.00 TO NODE   2832.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.83
 RAINFALL INTENSITY(INCH/HR) =   5.96
 TOTAL STREAM AREA(ACRES) =     7.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.26

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       57.40    15.20        4.501         44.38
     2       14.26     9.83        5.963          7.49

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       57.58     9.83       5.963
     2       68.16    15.20       4.501

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      68.16   Tc(MIN.) =   15.20
 TOTAL AREA(ACRES) =       51.9
 LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2832.00 =    2923.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2832.00 TO NODE   2828.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   995.00  DOWNSTREAM(FEET) =   979.00
  FLOW LENGTH(FEET) =    73.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  33.33
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      68.16
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   15.24
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2828.00 =    2996.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2828.00 TO NODE   2828.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       68.16    15.24       4.494       51.87
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2828.00 =    2996.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        1.00     5.30       8.881        1.70
  LONGEST FLOWPATH FROM NODE   2860.00 TO NODE   2828.00 =    2609.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      24.70       5.30        8.881
      2      68.66      15.24        4.494

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      68.66   Tc(MIN.) =   15.24
  TOTAL AREA(ACRES) =       53.6

****************************************************************************
  FLOW PROCESS FROM NODE   2828.00 TO NODE   2828.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2828.00 TO NODE   2827.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   979.00  DOWNSTREAM(FEET) =   946.00
  FLOW LENGTH(FEET) =   358.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.75
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      68.66
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   15.48
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2827.00 =    3354.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2827.00 TO NODE   2827.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.48
  RAINFALL INTENSITY(INCH/HR) =   4.45
  TOTAL STREAM AREA(ACRES) =    53.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     68.66

****************************************************************************
  FLOW PROCESS FROM NODE   2826.00 TO NODE   2825.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1025.00
  DOWNSTREAM ELEVATION(FEET) =   1012.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.792
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE   2825.00 TO NODE   2824.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1012.00  DOWNSTREAM ELEVATION(FEET) =  960.00
```

```
  STREET LENGTH(FEET) =   394.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.17
    HALFSTREET FLOOD WIDTH(FEET) =    2.33
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =    2.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.880
  SUBAREA AREA(ACRES) =    0.37      SUBAREA RUNOFF(CFS) =    3.00
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.57

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.26
  FLOW VELOCITY(FEET/SEC.) =  5.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.26
  LONGEST FLOWPATH FROM NODE   2826.00 TO NODE   2824.00 =     489.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2824.00 TO NODE   2823.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   954.00  DOWNSTREAM(FEET) =   947.00
  FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.57
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    3.01
  LONGEST FLOWPATH FROM NODE   2826.00 TO NODE   2823.00 =     574.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2823.00 TO NODE   2827.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    947.00  DOWNSTREAM(FEET) =    946.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    26.00   CHANNEL SLOPE =  0.0385
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0385 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.57
  FLOW VELOCITY(FEET/SEC) =   1.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =    3.27
  LONGEST FLOWPATH FROM NODE   2826.00 TO NODE   2827.00 =     600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2827.00 TO NODE   2827.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.27
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.57

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       68.66    15.48        4.448         53.57
      2        3.57     3.27        9.222          0.44

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       18.08     3.27       9.222
      2       70.39    15.48       4.448

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      70.39   Tc(MIN.) =   15.48
  TOTAL AREA(ACRES) =       54.0
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2827.00 =    3354.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2827.00 TO NODE   2822.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   946.00  DOWNSTREAM(FEET) =   945.00
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.67
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      70.39
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   15.49
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE   2822.00 =    3369.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2822.00 TO NODE     28.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    945.00  DOWNSTREAM(FEET) =    925.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   112.00   CHANNEL SLOPE =  0.1786
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1493 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      70.39
  FLOW VELOCITY(FEET/SEC) =   8.92 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.21   Tc(MIN.) =   15.70
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE     28.00 =    3481.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2821.00 TO NODE   2820.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1736.00
  DOWNSTREAM ELEVATION(FEET) =   1707.00
```

```
  ELEVATION DIFFERENCE(FEET) =     29.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
  FLOW PROCESS FROM NODE   2820.00 TO NODE   2819.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1707.00  DOWNSTREAM(FEET) =   1500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   460.00   CHANNEL SLOPE =  0.4500
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2200 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.78
  FLOW VELOCITY(FEET/SEC) =   2.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.92   Tc(MIN.) =    9.19
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE   2819.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2820.00 TO NODE   2819.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.229
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    3.50   SUBAREA RUNOFF(CFS) =    7.63
  TOTAL AREA(ACRES) =        3.8   TOTAL RUNOFF(CFS) =       8.24
  TC(MIN.) =    9.19

****************************************************************************
  FLOW PROCESS FROM NODE   2819.00 TO NODE   2818.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1200.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00   CHANNEL SLOPE =  0.2655
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1852 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.24
```

```
  FLOW VELOCITY(FEET/SEC) =   4.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.87   Tc(MIN.) =   13.06
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE   2818.00 =    1690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2819.00 TO NODE   2818.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.965
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3091
  SUBAREA AREA(ACRES) =   16.92   SUBAREA RUNOFF(CFS) =   25.20
  TOTAL AREA(ACRES) =       20.7   TOTAL RUNOFF(CFS) =      31.77
  TC(MIN.) =   13.06

****************************************************************************
  FLOW PROCESS FROM NODE   2818.00 TO NODE   2817.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   890.00   CHANNEL SLOPE =  0.1461
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1324 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      31.77
  FLOW VELOCITY(FEET/SEC) =   6.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.30   Tc(MIN.) =   15.36
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE   2817.00 =    2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2818.00 TO NODE   2817.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.471
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2883
  SUBAREA AREA(ACRES) =   11.28   SUBAREA RUNOFF(CFS) =   12.61
  TOTAL AREA(ACRES) =       32.0   TOTAL RUNOFF(CFS) =      41.22
  TC(MIN.) =   15.36

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2817.00 TO NODE   2816.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =    980.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   655.00   CHANNEL SLOPE =  0.1374
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1266 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      41.22
  FLOW VELOCITY(FEET/SEC) =   6.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   16.95
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE   2816.00 =    3235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2817.00 TO NODE   2816.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.196
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2885
  SUBAREA AREA(ACRES) =    5.72   SUBAREA RUNOFF(CFS) =    6.96
  TOTAL AREA(ACRES) =       37.7   TOTAL RUNOFF(CFS) =      45.65
  TC(MIN.) =   16.95

****************************************************************************
  FLOW PROCESS FROM NODE   2816.00 TO NODE   2816.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.95
  RAINFALL INTENSITY(INCH/HR) =   4.20
  TOTAL STREAM AREA(ACRES) =    37.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.65

****************************************************************************
  FLOW PROCESS FROM NODE   2815.00 TO NODE   2814.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1260.00
  DOWNSTREAM ELEVATION(FEET) =   1235.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.55
  TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
  FLOW PROCESS FROM NODE   2814.00 TO NODE   2816.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.00  DOWNSTREAM(FEET) =    980.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1510.00   CHANNEL SLOPE =  0.1689
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1444 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.55
  FLOW VELOCITY(FEET/SEC) =   2.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  11.82   Tc(MIN.) =   18.93
  LONGEST FLOWPATH FROM NODE   2815.00 TO NODE   2816.00 =    1610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2814.00 TO NODE   2816.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.908
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2893
  SUBAREA AREA(ACRES) =   15.71   SUBAREA RUNOFF(CFS) =   17.80
  TOTAL AREA(ACRES) =       16.0   TOTAL RUNOFF(CFS) =      18.10
  TC(MIN.) =   18.93

****************************************************************************
  FLOW PROCESS FROM NODE   2816.00 TO NODE   2816.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   18.93
  RAINFALL INTENSITY(INCH/HR) =   3.91
  TOTAL STREAM AREA(ACRES) =    16.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.10

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       45.65    16.95        4.196         37.70
      2       18.10    18.93        3.908         16.01

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       61.85    16.95       4.196
      2       60.60    18.93       3.908

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      61.85   Tc(MIN.) =   16.95
  TOTAL AREA(ACRES) =       53.7
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE   2816.00 =    3235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2816.00 TO NODE   2813.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   980.00  DOWNSTREAM(FEET) =   956.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.56
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      61.85
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   16.98
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE   2813.00 =    3310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2813.00 TO NODE     28.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    965.00  DOWNSTREAM(FEET) =    925.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   375.00   CHANNEL SLOPE =  0.1067
```

```
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1050 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      61.85
  FLOW VELOCITY(FEET/SEC) =   7.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   17.85
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE     28.00 =    3685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       61.85    17.85       4.058       53.71
  LONGEST FLOWPATH FROM NODE   2821.00 TO NODE     28.00 =    3685.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       70.39    15.70       4.408       54.01
  LONGEST FLOWPATH FROM NODE   2847.00 TO NODE     28.00 =    3481.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     124.79      15.70        4.408
      2     126.65      17.85        4.058

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     126.65   Tc(MIN.) =   17.85
  TOTAL AREA(ACRES) =      107.7
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      107.7  TC(MIN.) =     17.85
  PEAK FLOW RATE(CFS)   =     126.65
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Newland Sierra

Job #: 2660-02

Run Name:
P-29.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK 1	BANK 2	BANK 3
2916	2915.2	2	1485	1483	80	0.9	0.27				
2915.2	2915	5	1483	1475	120			valley			
2915.2	2915	8				0.9	0.30				
2915	2915	7	Tc=5min A=0.57 Q=0.3								
2915	2917	3	1469	1460	60			WQ outlet			
2917	2914.15	5	1460	1410	170			mtn			
2917	2914.15	8				0.35	3.21				
2914.15	2914.15	1						1 of 2			
2919.5	2919	2	1664	1640	85	0.35	0.04				
2919	2918	5	1640	1420	690			mtn			
2919	2918	8				0.35	2.36				
2918	2914.15	3	1420	1410	60						
2914.15	2914.15	1						2 of 2			
2914.15	2914	3	1410	1405	35						
2914	2914	1						1 of 2			
2914.3	2914.2	2	1484	1477	70	0.9	0.06				
2914.2	2914.1	6	1477	1408	425	0.9	0.39				
2914.1	2914	3	1406	1405	40						
2914	2914	1						2 of 2 WQ outlet			
2914	2913	3	1399	1398	50						
2913	2912	5	1398	1290	575			mtn			
2913	2912	8				0.35	4.69				
2912	2911	5	1290	1025	1175			mtn			
2912	2911	8				0.43	19.17				
2911	2910	5	1025	835	830			mtn			
2911	2910	8				0.43	23.79				
2910	29	5	835	800	455			valley			
29	29	1						1 of 2			
2927	2926	2	1603	1570	100	0.35	0.19				
2926	2925	5	1570	1470	307			mtn			
2926	2925	8				0.35	1.15				
2925	2924	5	1470	1390	520			mtn			
2925	2924	8				0.35	6.88				
2924	2922	5	1390	1370	361			mtn			
2924	2922	8				0.35	9.30				
2922	2921	5	1370	1300	1235			mtn			
2922	2921	8				0.43	29.57				
2921	2920	5	1300	893	1300			mtn			
2921	2920	8				0.44	15.07				
2920	29	5	893	800	335			mtn			

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Newland Sierra

Job #: 2660-02

Run Name:
P-29.DAT

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	C Factor	Area (ac.)	Comments	BANK		
									1	2	3
2920	29	8				0.46	27.04				
29	29	1						2 of 2			
							143.48				

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1355

                              Analysis prepared by:

                                Fuscoe Engineering
                               6390 Greenwich Drive
                                    Suite 200
                               San Diego, CA 92122

 ************************** DESCRIPTION OF STUDY **************************
* NEWLAND SIERRA - PROPOSED HYDROLOGY                                    *
* SUBBASIN 29 WITH DETENTION AT NODE 2915                                *
* JANUARY 2017                                                           *
 **************************************************************************

  FILE NAME: P-29D.DAT
  TIME/DATE OF STUDY: 15:28 01/30/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2916.00 TO NODE   2915.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1485.00
  DOWNSTREAM ELEVATION(FEET) =   1483.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.373
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.24
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      2.24

****************************************************************************
  FLOW PROCESS FROM NODE   2915.20 TO NODE   2915.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1483.00  DOWNSTREAM(FEET) =   1475.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   120.00   CHANNEL SLOPE =  0.0667
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.24
  FLOW VELOCITY(FEET/SEC) =   4.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.44   Tc(MIN.) =    2.81
  LONGEST FLOWPATH FROM NODE   2916.00 TO NODE   2915.00 =     200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2915.20 TO NODE   2915.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.9000
  SUBAREA AREA(ACRES) =    0.30   SUBAREA RUNOFF(CFS) =    2.49
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       4.73
  TC(MIN.) =    2.81

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2915.00 TO NODE   2915.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   5.00   RAIN INTENSITY(INCH/HOUR) =  9.22
 TOTAL AREA(ACRES) =     0.60   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
 FLOW PROCESS FROM NODE   2915.00 TO NODE   2917.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1469.00  DOWNSTREAM(FEET) =  1460.00
 FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   1.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.57
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.30
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    5.15
 LONGEST FLOWPATH FROM NODE   2916.00 TO NODE   2917.00 =     260.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2917.00 TO NODE   2914.15 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1460.00  DOWNSTREAM(FEET) =   1410.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   170.00   CHANNEL SLOPE =  0.2941
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1935 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.30
 FLOW VELOCITY(FEET/SEC) =   2.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.15   Tc(MIN.) =    6.30
 LONGEST FLOWPATH FROM NODE   2916.00 TO NODE   2914.15 =     430.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2917.00 TO NODE   2914.15 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.943
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3034
  SUBAREA AREA(ACRES) =    3.21   SUBAREA RUNOFF(CFS) =    8.92
  TOTAL AREA(ACRES) =        3.8   TOTAL RUNOFF(CFS) =       9.18
  TC(MIN.) =    6.30

****************************************************************************
  FLOW PROCESS FROM NODE   2914.15 TO NODE   2914.15 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.30
  RAINFALL INTENSITY(INCH/HR) =   7.94
  TOTAL STREAM AREA(ACRES) =     3.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.18

****************************************************************************
  FLOW PROCESS FROM NODE   2919.50 TO NODE   2919.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1664.00
  DOWNSTREAM ELEVATION(FEET) =   1640.00
  ELEVATION DIFFERENCE(FEET) =     24.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.401
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2919.00 TO NODE   2918.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1640.00  DOWNSTREAM(FEET) =   1420.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.00   CHANNEL SLOPE =  0.3188
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1997 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
```

```
  FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.60   Tc(MIN.) =   10.37
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2918.00 =     775.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2919.00 TO NODE   2918.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.760
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    2.36   SUBAREA RUNOFF(CFS) =    4.76
  TOTAL AREA(ACRES) =        2.4   TOTAL RUNOFF(CFS) =       4.84
  TC(MIN.) =   10.37

****************************************************************************
  FLOW PROCESS FROM NODE   2918.00 TO NODE   1914.15 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1420.00  DOWNSTREAM(FEET) =  1410.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.84
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.44
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   1914.15 =     835.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2914.15 TO NODE   2914.15 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.44
  RAINFALL INTENSITY(INCH/HR) =   5.74
  TOTAL STREAM AREA(ACRES) =     2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.84

  ** CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.18     6.30        7.943          3.81
      2        4.84    10.44        5.737          2.40

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.10     6.30       7.943
      2       11.47    10.44       5.737

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.10   Tc(MIN.) =    6.30
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2914.15 =     835.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2914.15 TO NODE   2914.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1410.00  DOWNSTREAM(FEET) =  1405.00
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.99
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.10
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    6.33
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2914.00 =     870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2914.00 TO NODE   2914.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.33
  RAINFALL INTENSITY(INCH/HR) =   7.92
  TOTAL STREAM AREA(ACRES) =     6.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.10

****************************************************************************
```

```
 FLOW PROCESS FROM NODE   2914.30 TO NODE   2914.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =   1484.00
 DOWNSTREAM ELEVATION(FEET) =   1477.00
 ELEVATION DIFFERENCE(FEET) =      7.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.398
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE   2914.20 TO NODE   2914.10 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1477.00  DOWNSTREAM ELEVATION(FEET) = 1408.00
 STREET LENGTH(FEET) =   425.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.12
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    2.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.73
 STREET FLOW TRAVEL TIME(MIN.) =   0.81   Tc(MIN.) =    2.21
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .9000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    3.24
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       3.73

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   2.00
  FLOW VELOCITY(FEET/SEC.) =  8.75   DEPTH*VELOCITY(FT*FT/SEC.) =   1.73
  LONGEST FLOWPATH FROM NODE   2914.30 TO NODE   2914.10 =     495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2914.10 TO NODE   2914.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1406.00  DOWNSTREAM(FEET) =  1405.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.30
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.73
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    2.30
  LONGEST FLOWPATH FROM NODE   2914.30 TO NODE   2914.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2914.00 TO NODE   2914.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.30
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.73

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       12.10     6.33        7.918          6.21
      2        3.73     2.30        9.222          0.45

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       14.13     2.30       9.222
      2       15.31     6.33       7.918

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.31   Tc(MIN.) =    6.33
  TOTAL AREA(ACRES) =        6.7
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2914.00 =     870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2914.00 TO NODE   2913.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1399.00  DOWNSTREAM(FEET) =  1398.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.62
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.31
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    6.42
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2913.00 =     920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2913.00 TO NODE   2912.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1398.00  DOWNSTREAM(FEET) =   1290.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.1878
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1539 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      15.31
  FLOW VELOCITY(FEET/SEC) =   5.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =    8.18
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2912.00 =    1495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2913.00 TO NODE   2912.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.714
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3562
  SUBAREA AREA(ACRES) =    4.69   SUBAREA RUNOFF(CFS) =   11.02
  TOTAL AREA(ACRES) =       11.4   TOTAL RUNOFF(CFS) =      27.14
  TC(MIN.) =    8.18

****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2911.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1290.00  DOWNSTREAM(FEET) =   1025.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.2255
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1718 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      27.14
  FLOW VELOCITY(FEET/SEC) =   6.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.81   Tc(MIN.) =   10.99
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2911.00 =    2670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2911.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.549
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4025
  SUBAREA AREA(ACRES) =   19.17   SUBAREA RUNOFF(CFS) =   45.74
  TOTAL AREA(ACRES) =       30.5   TOTAL RUNOFF(CFS) =      68.18
  TC(MIN.) =   10.99

****************************************************************************
  FLOW PROCESS FROM NODE   2911.00 TO NODE   2910.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    835.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00   CHANNEL SLOPE =  0.2289
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1730 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      68.18
  FLOW VELOCITY(FEET/SEC) =   9.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
  TRAVEL TIME(MIN.) =   1.46   Tc(MIN.) =   12.44
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE   2910.00 =    3500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2911.00 TO NODE   2910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.121
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4146
  SUBAREA AREA(ACRES) =   23.79   SUBAREA RUNOFF(CFS) =   52.39
  TOTAL AREA(ACRES) =       54.3   TOTAL RUNOFF(CFS) =     115.31
  TC(MIN.) =   12.44

****************************************************************************
  FLOW PROCESS FROM NODE   2910.00 TO NODE     29.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.0769
  CHANNEL FLOW THRU SUBAREA(CFS) =     115.31
  FLOW VELOCITY(FEET/SEC) =  13.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.55   Tc(MIN.) =   13.00
  LONGEST FLOWPATH FROM NODE   2919.50 TO NODE     29.00 =    3955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.00
  RAINFALL INTENSITY(INCH/HR) =   4.98
  TOTAL STREAM AREA(ACRES) =    54.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    115.31

****************************************************************************
  FLOW PROCESS FROM NODE   2927.00 TO NODE   2926.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1603.00
  DOWNSTREAM ELEVATION(FEET) =   1570.00
  ELEVATION DIFFERENCE(FEET) =     33.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   2926.00 TO NODE   2925.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1570.00  DOWNSTREAM(FEET) =   1470.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   307.00   CHANNEL SLOPE =  0.3257
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2010 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.53
  FLOW VELOCITY(FEET/SEC) =   2.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =    8.30
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2925.00 =     407.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2926.00 TO NODE   2925.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.648
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.15   SUBAREA RUNOFF(CFS) =    2.68
  TOTAL AREA(ACRES) =        1.3   TOTAL RUNOFF(CFS) =       3.12
  TC(MIN.) =    8.30

****************************************************************************
  FLOW PROCESS FROM NODE   2925.00 TO NODE   2924.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1390.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.1538
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1369 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =       3.12
 FLOW VELOCITY(FEET/SEC) =   3.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.86   Tc(MIN.) =   11.17
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2924.00 =     927.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2925.00 TO NODE   2924.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.491
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    6.88   SUBAREA RUNOFF(CFS) =   13.22
 TOTAL AREA(ACRES) =        8.2   TOTAL RUNOFF(CFS) =      15.80
 TC(MIN.) =   11.17

****************************************************************************
 FLOW PROCESS FROM NODE   2924.00 TO NODE   2922.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1390.00  DOWNSTREAM(FEET) =   1370.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   361.00   CHANNEL SLOPE =  0.0554
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0554 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      15.80
 FLOW VELOCITY(FEET/SEC) =   3.30 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   12.99
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2922.00 =    1288.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2924.00 TO NODE   2922.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.982
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
```

```
  SUBAREA AREA(ACRES) =    9.30   SUBAREA RUNOFF(CFS) =   16.22
  TOTAL AREA(ACRES) =       17.5   TOTAL RUNOFF(CFS) =      30.55
  TC(MIN.) =   12.99

****************************************************************************
  FLOW PROCESS FROM NODE   2922.00 TO NODE   2921.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1370.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1235.00   CHANNEL SLOPE =  0.0567
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0567 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      30.55
  FLOW VELOCITY(FEET/SEC) =   4.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.94   Tc(MIN.) =   17.93
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2921.00 =    2523.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2922.00 TO NODE   2921.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.046
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4002
  SUBAREA AREA(ACRES) =   29.57   SUBAREA RUNOFF(CFS) =   51.44
  TOTAL AREA(ACRES) =       47.1   TOTAL RUNOFF(CFS) =      76.25
  TC(MIN.) =   17.93

****************************************************************************
  FLOW PROCESS FROM NODE   2921.00 TO NODE   2920.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    893.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1300.00   CHANNEL SLOPE =  0.3131
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1983 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      76.25
  FLOW VELOCITY(FEET/SEC) =  10.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =   19.99
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2920.00 =    3823.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2921.00 TO NODE   2920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.773
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4099
  SUBAREA AREA(ACRES) =   15.07   SUBAREA RUNOFF(CFS) =   25.02
  TOTAL AREA(ACRES) =       62.2   TOTAL RUNOFF(CFS) =      96.13
  TC(MIN.) =   19.99

****************************************************************************
  FLOW PROCESS FROM NODE   2920.00 TO NODE     29.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    893.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.2776
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1892 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      96.13
  FLOW VELOCITY(FEET/SEC) =  11.14 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =   20.49
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE     29.00 =    4158.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2920.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.713
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4251
  SUBAREA AREA(ACRES) =   27.04   SUBAREA RUNOFF(CFS) =   46.19
  TOTAL AREA(ACRES) =       89.2   TOTAL RUNOFF(CFS) =     140.79
  TC(MIN.) =   20.49

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.49
  RAINFALL INTENSITY(INCH/HR) =   3.71
  TOTAL STREAM AREA(ACRES) =    89.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    140.79

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      115.31    13.00        4.980         54.31
      2      140.79    20.49        3.713         89.20

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      204.62    13.00       4.980
      2      226.76    20.49       3.713

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     226.76   Tc(MIN.) =   20.49
  TOTAL AREA(ACRES) =      143.5
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE     29.00 =    4158.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      143.5  TC(MIN.) =     20.49
  PEAK FLOW RATE(CFS)   =     226.76
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX A

AES

Rational Method Hydrology

Proposed Condition

BASIN E

THE FOLLOWING SUBBASINS OF MAJOR BASIN E
HAVE NO GRADING, THUS THERE IS NO CHANGE IN HYDROLOGY FOR
THE PROPOSED CONDITION.

32
33
34
35