APPENDIX A

AES
Rational Method Hydrology

Existing Condition

BASIN A
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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<td>100</td>
<td>860.0</td>
<td>575.0</td>
<td>1,640.0</td>
<td>0.26</td>
<td>54.7</td>
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<td>444.0</td>
<td>0.26</td>
<td>71.87</td>
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</table>
MERR01.TXT

****************************

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 1 - NO DETENTION ROUTING
2469.01A - OCTOBER 2006

FILE NAME: MERR01.DAT
TIME/DATE OF STUDY: 08:56 09/28/2006

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>Width</th>
<th>Crossfall</th>
<th>Street-Crossfall</th>
<th>Curb</th>
<th>Gutter-Geometries</th>
<th>Manning N</th>
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</thead>
<tbody>
<tr>
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<td>20.0</td>
<td>0.018/0.018/0.020</td>
<td>0.67</td>
<td>2.00 0.0313 0.167 0.0150</td>
<td></td>
</tr>
</tbody>
</table>

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/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!
MERR01.TXT

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 LACFCF/RCFC&WCW 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 LACFCF/RCFC&WCW 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 LACFCF/RCFC&WCW HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 6.13
FLOW VELOCITY(Feet/SEC) = 4.04 (PER LACFCF/RCFC&WCW 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) = 10.13 TOTAL RUNOFF(CFS) = 20.96
Tc(MIN.) = 10.04
MERR01.TXT

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 LACFCFD/RFCF&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 20.96
FLOW VELOCITY(Feet/SEC) = 6.32 (PER LACFCFD/RFCF&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 LACFCFD/RFCF&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 30.43
FLOW VELOCITY(Feet/SEC) = 6.69 (PER LACFCFD/RFCF&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 PIPE SIZE (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
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE   9/28/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION  16 MIN.
6 INCHES RAINFALL 3.5 INCHES
BA  .REA 71.67 ACRES
RUNOFF COEFFICIENT  0.28
PEAK DISCHARGE  86.94 CFS

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<td>200</td>
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</table>

| 13.16 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 # 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*

<table>
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<tr>
<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING N</th>
<th>SIDE/PARK HEIGHT</th>
<th>SIDEWAY (FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
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<tr>
<td>1</td>
<td>30.0</td>
<td>20.0</td>
<td>0.018/0.018/0.020</td>
<td>0.67</td>
<td>2.00</td>
<td>0.0313</td>
<td>0.167</td>
<td>0.0150</td>
<td></td>
</tr>
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</table>

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/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

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 201.00 TO NODE 200.00 IS CODE = 53

COMPUTE NATURAL MOUNTAIN CHANNEL FLOW

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 200.00 TO NODE 200.00 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 200.00 TO NODE 2.00 IS CODE = 41

>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>USING USER-SPECIFIED PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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199.65 Total Area
DESCRIPTION OF STUDY

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

FILE NAME: MERR03.DAT

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*

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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, 10.0%, IS USED IN Tc CALCULATION!
MERR03.TXT

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 <<<<
>>> TRAVEL TIME 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 = 0.1906 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1.0 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 = 0.2700
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 = 0.3500
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 <<<<<

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 = 81

FLOW PROCESS FROM NODE 351.10 TO NODE 351.10 IS CODE = 53

>>>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW <<<<<

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

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

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<<<
>>TRAVEL TIME THRU SUBAREA<<<

ELEVATION DATA: UPSTREAM (FEET) = 1005.00 DOWNSTREAM (FEET) = 888.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 495.00
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1755 (PER LACFCD/RCF&C&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA (CFS) = 37.28
FLOW VELOCITY (FEET/SEC) = 7.83 (PER LACFCD/RCF&C&WCD HYDROLOGY MANUAL)
LONGEST FLOWPATH FROM NODE 351.40 TO NODE 350.00 = 2418.00 FEET.

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>>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

--------------------------------------------------------------------------

>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<

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
TOTAL AREA (ACRES) = 50.85
LONGEST FLOWPATH FROM NODE 351.40 TO NODE 350.00 = 2418.00 FEET.

--------------------------------------------------------------------------

>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<

FLOW PROCESS FROM NODE 350.00 TO NODE 350.00 IS CODE = 81

--------------------------------------------------------------------------

>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<

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
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
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 = 0.0937 (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

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 = 0.0679 (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 = 1
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) = 1585.00
DOWNSTREAM ELEVATION (FEET) = 37.00
ELEVATION DIFFERENCE (FEET) = 120.00

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 <<<<

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 = 0.1870 (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 = 0.3500
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 <<<

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 = 0.1962 (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 = 0.3500
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 <<<

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 = 0.1163 (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 **

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRES)</th>
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<td>42.67</td>
<td>19.35</td>
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<td>31.65</td>
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** RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 3 STREAMS.**

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</thead>
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<tr>
<td>3</td>
<td>141.52</td>
<td>25.42</td>
<td>3.231</td>
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</tbody>
</table>

** 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**

** TRAVEL TIME 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

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 OFPIPES = 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

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 OFPIPES = 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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>401.8</td>
<td>2</td>
<td>980.0</td>
<td>950.0</td>
<td>110.0</td>
<td>0.25</td>
<td>0.14 Initial Runoff</td>
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<tr>
<td>401.8</td>
<td>401.6</td>
<td>5</td>
<td>950.0</td>
<td>685.0</td>
<td>674.0</td>
<td>0.25</td>
<td>Channel Flow</td>
</tr>
<tr>
<td>401.6</td>
<td>401.6</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Add Area</td>
</tr>
<tr>
<td>401.6</td>
<td>401</td>
<td>5</td>
<td>685.0</td>
<td>585.0</td>
<td>512.0</td>
<td>0.25</td>
<td>Ex. 30&quot; CPS Caltrans</td>
</tr>
<tr>
<td>401</td>
<td>4</td>
<td>4</td>
<td>585.0</td>
<td>515.0</td>
<td>545.0</td>
<td>0.25</td>
<td>Storm Drain System</td>
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</tbody>
</table>

|               |        |               |               |               |               | 8.04       | Ex. 30" CPS Caltrans            |
| 401          | 4      | 4             | 585.0         | 515.0         | 545.0         | 11.64      | Total Area                      |

11.64 Total Area
FILE NAME: MERR04.DAT

-- 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*

NO. WIDTH CROSSFALL SIDE/WAY HEIGHT LIP HIKE FACTOR
=== ======== ======== ======== ======== ======== ========
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
TRAVEL TIME 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 401.00 = 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
TRAVEL TIME 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 PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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**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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>SIDE / SIDE / PARK-HEIGHT</th>
<th>WIDTH</th>
<th>LIP</th>
<th>HIKE</th>
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</thead>
<tbody>
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**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**

---

**RATIONALE 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<<<<
>>>>>TRAVEL TIME 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 = 0.1898 (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 = 0.2500
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<<<<
>>>>>TRAVEL TIME 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 = 0.1771 (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 = 0.2500
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**

**FLOW PROCESS FROM NODE 5.20 TO NODE 5.10 IS CODE = 41**

**FLOW PROCESS FROM NODE 5.10 TO NODE 5.10 IS CODE = 1**

**FLOW PROCESS FROM NODE 5.50 TO NODE 5.40 IS CODE = 21**

---

**TOTAL NUMBER OF STREAMS = 2**

**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**

---

**USER SPECIFIED (SUBAREA):**

**NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = 0.2700**

**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**

**INITIAL 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**

---

**Page 3**
**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 PIPE SIZE (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 PIPE SIZE (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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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<tbody>
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<td>17.80</td>
<td>4.065</td>
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<td>1.09</td>
<td>9.83</td>
<td>5.964</td>
<td>5.964</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>12.15</td>
<td>9.83</td>
<td>5.964</td>
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<tr>
<td>2</td>
<td>20.77</td>
<td>17.80</td>
<td>4.065</td>
</tr>
</tbody>
</table>

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

**FLOW PROCESS FROM NODE 5.10 TO NODE 5.00 IS CODE = 41**

**FLOW PROCESS FROM NODE 5.00 TO NODE 5.00 IS CODE = 1**

**FLOW PROCESS FROM NODE 504.00 TO NODE 503.80 IS CODE = 21**

**FLOW PROCESS FROM NODE 503.80 TO NODE 503.60 IS CODE = 53**
FLOW PROCESS FROM NODE  503.80 TO NODE  503.60 IS CODE = 81

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

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 = 0.253 (PER LACFCD/RCFC&WCW HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 5.54
FLOW VELOCITY(FT/SEC) = 4.47 (PER LACFCD/RCFC&WCW 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  503.00 TO NODE  502.00 IS CODE = 81

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  503.60 TO NODE  503.00 IS CODE = 53

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 = 0.1517 (PER LACFCD/RCFC&WCW HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 22.52
FLOW VELOCITY(FT/SEC) = 6.15 (PER LACFCD/RCFC&WCW HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 4.43 TC(MIN.) = 16.66
LONGEST FLOWPATH FROM NODE 504.00 TO NODE 502.00 = 3235.00 FEET.
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

FLOW PROCESS FROM NODE 502.00 TO NODE 501.50 IS CODE = 81

FLOW PROCESS FROM NODE 501.50 TO NODE 501.00 IS CODE = 41

FLOW PROCESS FROM NODE 501.00 TO NODE 501.00 IS CODE = 41

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 501.00 TO NODE 5.00 IS CODE = 41
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

INFLOWS FROM NODE 5.00 TO NODE 5.00 IS CODE = 1

TOTAL NUMBER OF STREAMS = 2
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

** 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
<table>
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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FILE NAME: MERR06.DAT

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-DEFINIED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*

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.*

FLOWS 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 <<<<<
>>>>> TRAVEL TIME 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
<table>
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
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2.1 Total Area
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</table>
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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 # 7                                                         *
* 2469.01A - OCTOBER 2006                                              *
************************************************************************

FILE NAME: MERR07.DAT
----------------------------------------------------------------------------

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/OUT-/PARK-</th>
<th>SIDE/WAY</th>
<th>IN- /OUT-/PARK-</th>
<th>HEIGHT</th>
<th>WIDTH</th>
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<td>0.0313</td>
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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.*

WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
MERR07.TXT

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 <<<<<
>>> TRAVEL TIME 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 = 0.1993 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1.0 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 = 0.2800
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 <<<<<

--- 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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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
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<th>Length (feet)</th>
<th>Runoff Coeff.</th>
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**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:

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

************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                      *
* SUBBASIN # 8                                                 *
* 2469.01A - OCTOBER 2006                                          *
**************************************************************************

FILE NAME: MERR08.DAT

--- 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**

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING</th>
<th>WIDTH CROSSFALL</th>
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<td>0.167</td>
<td>0.0150</td>
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</table>

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 <<<<<
>>>>> TRAVEL TIME 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 <<<<<
>>>>> TRAVEL TIME 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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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
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Total Area
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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 # 9                                                             *
* 2469.01A - OCTOBER 2006                                                  *
**************************************************************************

FILE NAME: MERR09.DAT

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==20==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.*

WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.0%, 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<<<<
<<<<TRAVEL TIME 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 902.60 TO NODE 902.40 IS CODE = 53
<<<<COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
<<<<TRAVEL TIME 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) = 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 902.40 TO NODE 902.00 IS CODE = 53

<<<<COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
<<<<TRAVEL TIME THRU SUBAREA<<<<
ELEVATION DATA: UPSTREAM (FEET) = 905.00 DOWNSTREAM (FEET) = 705.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 705.00 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 902.40 TO NODE 902.00 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<<<<<

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<<<<<

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 PIPECIZE (EXISTING ELEMENT) <<<<<
MERR09.TXT

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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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*

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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 <<<<

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
E-10.TXT

>>>>

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

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<<<<

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

Page 4
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

FLOW PROCESS FROM NODE 1030.40 TO NODE 1030.00 IS CODE = 51

FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 51
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
E-10.TXT

>>>>>>>>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
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<<<<<<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

Page 7
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

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

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

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

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 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<<<<<
>>> TRAVEL TIME 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
> TRAVEL TIME 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
> TRAVEL TIME 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 = 0.2700
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:
DEPTl(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<<<<<<
>>>>>TRAVEL TIME 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 = 0.2800
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:
DEPTl(Feet) = 1.40  FLOW VELOCITY(Feet/SEC.) = 15.92
LONGEST FLOWPATH FROM NODE 1004.00 TO NODE 1003.40 = 2563.00 FEET.

*****************************************************************************
FLOW PROCESS FROM NODE 1003.40 TO NODE 1002.00 IS CODE = 51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<
>>>>>TRAVEL TIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) = 975.00  DOWNSTREAM(FEET) = 700.00
E-10.TXT

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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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)    (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!
E-11.TXT

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<<<

TRAVEL TIME 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

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<<<

TRAVEL TIME 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

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:

Page 2
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

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

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.
FLO W 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

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 8.59 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.

FLO W 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(FT/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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1  (feet)</th>
<th>Elev 2  (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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<td>1202.8</td>
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<td>1,110.0</td>
<td>75.0</td>
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<tr>
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<td>1,040.0</td>
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<td></td>
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<tr>
<td>1202.6</td>
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<td></td>
<td></td>
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<tr>
<td>1202.8</td>
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<tr>
<td>1201</td>
<td>12</td>
<td>775.0</td>
<td>650.0</td>
<td>545.0</td>
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<td></td>
<td>EX . 36'' CSP Caltrans Storm Drain</td>
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</table>

14.21 Total Area
FILE NAME: MERR12.DAT

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:

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF CROWN TO STREET-CROSSFALL (FT)</th>
<th>SIDE/OUTWAY (FT)</th>
<th>CROWN/GEOMETRIES: MANNING (FT)</th>
<th>N</th>
<th>WATER CROSSFALL (FT)</th>
<th>SIDE/PARKWAY (FT)</th>
<th>HEIGHT (FT)</th>
<th>WIDTH (FT)</th>
<th>LIP (FT)</th>
<th>HIKE FACTOR</th>
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<td>0.0313</td>
<td>0.167</td>
<td>0.0150</td>
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</tr>
</tbody>
</table>

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.*

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

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<<<
>>> TRAVEL TIME 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 = 0.1517 (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 <<<
>>> TRAVEL TIME 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 = 0.1071 (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<<<<<
>>>>>TRAVEL TIME 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 OFPIPES = 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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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</thead>
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</tbody>
</table>

| 130.03       | 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:

******************************************************************************************************************
** DESCRIPTION OF STUDY **************************************************************
* MERRIAM MOUNTAINS - 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*

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<<<<

*SFR SPFTTFD(SURARFA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FT) = 75.00
UPSTREAM ELEVATION(FT) = 1350.00
DOWNSTREAM ELEVATION(FT) = 1315.00
ELEVATION DIFFERENCE(FT) = 35.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 5.427
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
MERR13.TXT

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<<<<<
>>>>> TRAVEL TIME 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/RFCF&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 1.10
FLOW VELOCITY(FeET/SEC) = 2.13 (PER LACFCD/RFCF&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<<<<<
>>>>> TRAVEL TIME 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/RFCF&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 7.60
FLOW VELOCITY(FeET/SEC) = 3.78 (PER LACFCD/RFCF&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
MERR13.TXT

FLOW PROCESS FROM NODE 1304.40 TO NODE 1304.00 IS CODE = 53


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MERR13.TXT
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. DI/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
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
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*** DESCRIPTION OF STUDY ***

MERRIAM MOUNTAINS - EXISTING HYDROLOGY

SUBBASIN # 141

2469.01A - OCTOBER 2006

**************************************************************************

FILE NAME: MERR141.DAT

**************************************************************************

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

**************************************************************************

*** 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

**************************************************************************

*** USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION ***
**FLOW PROCESS FROM NODE 1411.00 TO NODE 1410.00 IS CODE = 53**

---

**COMPUTE NATURAL MOUNTAIN CHANNEL FLOW**

---

**FLOW VELOCITY (FEET/SEC) = 2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)**

**CHANNEL FLOW THRU SUBAREA(CFS) = 0.37**

**ELEVATION DATA: UPSTREAM (FEET) = 1125.00 DOWNSTREAM (FEET) = 900.00**

---

**FLOW PROCESS FROM NODE 1410.00 TO NODE 14.10 IS CODE = 41**

---

**COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA**

---

**FLOW VELOCITY (FEET/SEC.) = 12.21**

**NUMBER OF PIPES = 1**

**PIPE TRAVEL TIME (MIN.) = 0.86**

---

**END OF STUDY SUMMARY:**

**TOTAL AREA (ACRES) = 4.44**

**TOTAL RUNOFF(CFS) = 6.87**

**TC(MIN.) = 10.15**

**PEAK FLOW RATE (CFS) = 6.87**

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**END OF RATIONAL METHOD ANALYSIS**
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
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<th>Comments</th>
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<td>3.93 Total Area</td>
</tr>
</tbody>
</table>
 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!
MERR14.TXT

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<<<<<
>>TRAVEL TIME 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&D 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&D 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 PIPE SIZE (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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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
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6.84 Total Area
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**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 # 151

* 2469.01A - OCTOBER 2006

**************************************************************************

FILE NAME: MERR151.DAT


-----------------------------------------------------------------------------

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 I) = 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

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

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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
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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 <<<<<<

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 1507.00 TO NODE 1506.00 IS CODE = 53

>>>>>>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW <<<<<<

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 1506.00 TO NODE 1505.00 IS CODE = 53

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CREASE NATURAL MOUNTAIN CHANNEL FLOW

FLOW 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)
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(MI N.) = 13.99

FLOW PROCESS FROM NODE 1505.00 TO NODE 1504.00 IS CODE = 41

COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

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
GIVEN PIPE DIAMETER( INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 36.05
PIPE TRAVEL TIME(MI N.) = 0.20 Tc(MI N.) = 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(MI N.) = 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 <<<

**FLOW VELOCITY (FEET/SEC) = 2.45**
**TRAVEL TIME (MIN.) = 7.29**
**Tc (MIN.) = 14.39**

**ELEVATION DATA: UPSTREAM (FEET) = 1195.00**
**DOWNSTREAM (FEET) = 891.00**
**CHANNEL LENGTH THRU SUBAREA (FEET) = 1070.00**
**CHANNEL SLOPE = 0.2841**
**EFFECTIVE SLOPE = 0.1910** (PER LACFC/RCFC&WCD HYDROLOGY MANUAL)
**NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION**

**SUBAREA FLOW THRU SUBAREA (CFS) = 0.28**

**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**
**NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = 0.2500**
**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 <<<

**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 <<<

**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 PIPE SIZE (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

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

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

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 **

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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tr>
<td>2</td>
<td>50.75</td>
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<td>4.630</td>
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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

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 43.30  TC (MIN.) = 14.67
PEAK FLOW RATE (CFS) = 50.75

END OF RATIONAL METHOD ANALYSIS
<table>
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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<td>Ex. 42' CSP/RCP</td>
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</table>

**Total Area:**

29.59
MERR16.TXT

---------------------------------------------
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
-----------------------------------------------------------------------
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) (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(FT) = 15.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 5.427
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.0%, 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<<<

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<<<

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 1602.60 = 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

Page 2
FLOW PROCESS FROM NODE 1602.00 TO NODE 1601.00 IS CODE = 53

>>>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW <<<<<

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:
EFFECTIV SLOPE = .1965 (PER LACFCD/RFCF&C WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA (CFS) = 28.60
FLOW VELOCITY (FEET/SEC) = 7.58 (PER LACFCD/RFCF&C 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 = 0.2600
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 <<<<<

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
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<th>TIME (MIN)</th>
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<td>17</td>
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</table>

14.27 Total Area
FILE NAME: MERR17.DAT

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN-/OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR</th>
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</thead>
<tbody>
<tr>
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<td>0.018/0.018/0.020 0.67 2.00 0.0313 0.167 0.0150</td>
</tr>
</tbody>
</table>

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
**MERR17.TXT**

**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 <<<<< *
* >>>>>> TRAVEL TIME 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 = 0.2300** (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 = 0.2780**

**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 <<<<< *
* >>>>>> TRAVEL TIME 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 = 0.1712** (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 = 0.2600**

**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 PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coef.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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6.5 Total Area
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<th>Length (feet)</th>
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</table>
**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

**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**

<table>
<thead>
<tr>
<th>NO.</th>
<th>(FT)</th>
<th>IN-/SIDE/PARK-WAY</th>
<th>(FT)</th>
<th>(FT)</th>
<th>HIKE FACTOR</th>
<th>(n)</th>
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<td>0.018</td>
<td>0.018</td>
<td>0.020</td>
<td>0.67</td>
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</table>

**GLOBAL STREET FLOW-DEPTH CONSTRAINTS:**

1. Relative Flow-Depth = 0.00 FEET (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 <<<<
>>> TRAVEL TIME 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 PIPE SIZE (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

END OF RATIONAL METHOD ANALYSIS
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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<td>1902.4</td>
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<td>1,090.0</td>
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<td>4</td>
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<td>930.0</td>
<td>441.0</td>
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<td>Ex. 60'' RCP Caltrans Storm Drain</td>
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Total Area: 81.22
MERR19.TXT

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

* 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*

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<th>NO.</th>
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<th>SIDE</th>
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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<<<<<<
MERR19.TXT

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/RFCFC&WCW 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/RFCFC&WCW 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/RFCFC&WCW HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 2.96
FLOW VELOCITY(FeET/SEC) = 3.53 (PER LACFCD/RFCFC&WCW 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

Page 2
MERR19.TXT

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/RCCF&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 20.83
FLOW VELOCITY(Feet/Sec) = 5.45 (PER LACFCD/RCCF&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/RCCF&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 60.66
FLOW VELOCITY(Feet/Sec) = 5.89 (PER LACFCD/RCCF&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 5.72 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
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Analysis prepared by:
Fuscoe Engineering
6390 Greenwich Dr.
Suite 170
San Diego, CA 92122

**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*

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<th>LIP (FT)</th>
<th>HIKE FACTOR</th>
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GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
- RELATIVE FLOW-DEPTH = 0.00 FEET
- AS (MAXIMUM ALLOWABLE STREET FLOW DEPTH) - (TOP-OF-CURB)
- MAXIMUM OVERLAND FLOW SLOPE = 10.0% (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 (N) = 6.151
- WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.0%, 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<<<<<
TRAVEL TIME 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 = 0.1000 (PER LACFC/D/RC/FCG&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 LACFC/D/RC/FCG&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 2000.60 TO NODE 2000.00 IS CODE = 53

>>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
TRAVEL TIME 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 = 0.0842 (PER LACFC/D/RC/FCG&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA (CFS) = 9.17
FLOW VELOCITY (FEET/SEC) = 3.40 (PER LACFC/D/RC/FCG&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 2000.00 TO NODE 2000.00 IS CODE = 53

>>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
TRAVEL TIME 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 = 0.0842 (PER LACFC/D/RC/FCG&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA (CFS) = 9.17
FLOW VELOCITY (FEET/SEC) = 3.40 (PER LACFC/D/RC/FCG&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 2000.00 TO NODE 2000.00 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 2000.00 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

Page 2
FLOW PROCESS FROM NODE 2000.00 TO NODE 20.20 IS CODE = 41

>>> COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA <<<<<
>>> USING USER-SPECIFIED PIPIESIZE (EXISTING ELEMENT) <<<<<

ELEVATION DATA: UPSTREAM (FEET) = 986.50  DOWNSTREAM (FEET) = 969.10
FLOW LENGTH (FEET) = 300.00  MAN宁ING’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 PIPIESIZE (EXISTING ELEMENT) <<<<<

ELEVATION DATA: UPSTREAM (FEET) = 968.60  DOWNSTREAM (FEET) = 958.00
FLOW LENGTH (FEET) = 532.00  MAN宁ING’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 I) = 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 <<<<<
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

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

FLOW PROCESS FROM NODE 20.10 TO NODE 20.10 IS CODE = 1

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 **

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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.

FOLLOW PROCESS FROM NODE 20.10 TO NODE 20.00 IS CODE = 41

>>>>> COMPUTE PIPE FLOW TRAVEL TIME THRU SUBAREA <<<<<

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
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Total: 35.83
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

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 *

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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 <<<
>>> TRAVEL TIME 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 = 0.2082 (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 = 0.2600
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 <<<
>>> TRAVEL TIME 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 = 0.1000 (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 = 0.2800
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

Page 2
FLOW PROCESS FROM NODE 2100.40 TO NODE 21.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVEL TIME 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

Page 3
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
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<th>Runoff Coeff.</th>
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<td>Storm Drain</td>
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Total Area: 12.07
MERR221.TXT

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 # 221
* 2469.01A - OCTOBER 2006
**************************************************************************

FILE NAME: MERR221.DAT

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
NO. (FT) SIDE / SIDE / WAY (FT) (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 CALCUATION!
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
TRAVEL TIME 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 = 0.1642 (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

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 = 0.1642 (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 = 53

COMPUTE NATURAL MOUNTAIN CHANNEL FLOW
TRAVEL TIME 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 = 0.1642 (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 2211.00 TO NODE 2210.00 IS CODE = 53

COMPUTE NATURAL MOUNTAIN CHANNEL FLOW
TRAVEL TIME 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 = 0.1915 (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

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 = 0.1915 (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 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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<th>Node to Node</th>
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<th>Runoff Coeff.</th>
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13.38 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 #: 222

* 2469.01A - OCTOBER 2006

**************************************************************************

FILE NAME: MERR222.DAT


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*

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<td>20.0</td>
<td>0.018/0.018/0.020</td>
<td>0.67 2.00 0.0313 0.167 0.0150</td>
</tr>
</tbody>
</table>

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!
FLOW PROCESS FROM NODE 2222.00 TO NODE 2221.00 IS CODE = 53

>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW <<<
>>> TRAVEL TIME 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 = 0.1795 (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 2221.00 TO NODE 2220.00 IS CODE = 53

>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW <<<
>>> TRAVEL TIME 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 = 0.1921 (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 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
<table>
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
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<th>Length (feet)</th>
<th>Friction Coeff.</th>
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| 4.93 | Total Area |
FILE NAME: MERR223.DAT

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*

<table>
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<th>NO.</th>
<th>CROWN TO STREET</th>
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<th>CURB GUTTER GEOMETRIES: MANNING</th>
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<td>WIDTH (FT)</td>
<td>CROSSFALL</td>
<td>WIDTH CROWNSIDE/PARK/DEPTH (FT)</td>
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<td>---------------------------------</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>0.0150</td>
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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!
MERR223.TXT

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<<<<<
> >>>> TRAVEL TIME 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 = 0.2228 (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 FLOW PATH 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<<<<<

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 FLOW PATH 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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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<tbody>
<tr>
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<td>5.32 Total Area</td>
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5.32 Total Area
### Analysis of MERRIAM MOUNTAINS - EXISTING HYDROLOGY

**Subbasin # 224**

**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 (Inches)**: 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**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>30.0</td>
<td>0.018 / 0.018 / 0.020</td>
<td>0.67</td>
<td>2.00 0.0313 0.167 0.0150</td>
</tr>
</tbody>
</table>

**Global Street Flow-Depth Constraints:**

1. **Relative Flow-Depth** = 0.00 FEET  
   as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. **(Depth) x (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 Storm Event (Year):** 100.00
- **Relative Flow-Depth = 0.00 FEET**
- **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!
MERR224.TXT

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<<<<<
>>>>>TRAVEL TIME 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 = 0.1786
NOTE: CHANNEL FLOW OF 1.0 CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.42
FLOW VELOCITY(FEET/SEC) = 2.37
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 = 0.3330
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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
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**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 # 22                                                            *
* 2469.01A - OCTOBER 2006                                                  *
**************************************************************************

FILE NAME: MERR22.DAT

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) (FT) (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 = 0.3500
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 DIFERENCE (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<<<

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 2204.00 TO NODE 2201.00 IS CODE = 81

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 2201.00 TO NODE 2200.00 IS CODE = 53

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 2201.00 = 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<<<<<

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/RFCF & 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/RFCF & 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

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 LACFCID/RCFC&WCD HYDROLOGY MANUAL)

CHANNEL FLOW THRU SUBAREA (CFS) = 14.82
FLOW VELOCITY (FEET/SEC) = 5.57 (PER LACFCID/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 PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Friction Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2312</td>
<td>2311</td>
<td>1,150.0</td>
<td>1,080.0</td>
<td>100.0</td>
<td>0.46</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>2311</td>
<td>2310</td>
<td>1,080.0</td>
<td>815.0</td>
<td>930.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2311</td>
<td>2310</td>
<td></td>
<td></td>
<td></td>
<td>0.43</td>
<td>4.32</td>
<td>EX. 24&quot; CMP Culvert</td>
</tr>
<tr>
<td>2310</td>
<td>23.1</td>
<td>815.0</td>
<td>813.0</td>
<td>46.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|               |      |              |              |              |                 |            | 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

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF-CROWN Width (FT)</th>
<th>STREET-CROSSFALL Height (FT)</th>
<th>CURB GUTTER-GEOMETRIES: Manning Width Width Width</th>
<th>IN-/OUT-/PARK- WAY Height (FT)</th>
<th>(FT) (FT) (FT) (FT)</th>
<th>HIKE FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30.0</td>
<td>20.0</td>
<td>0.018/0.018/0.020</td>
<td>0.67</td>
<td>2.00</td>
<td>0.0313</td>
</tr>
</tbody>
</table>

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.*

FOLLOW PROCESS FROM NODE 2312.00 TO NODE 2311.00 IS CODE = 21

FOLLOW PROCESS FROM NODE 2312.00 TO NODE 2311.00 IS CODE = 21

ASSUMPTIONS:
- 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
- DOWNSRREAM ELEVATION (FEET) = 1080.00
- ELEVATION DIFFERENCE (FEET) = 70.00
- SUBAREA OVERLAND TIME OF FLOW (MIN) = 5.348

WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.0%, 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

FLOW PROCESS FROM NODE 2311.00 TO NODE 2310.00 IS CODE = 81

FLOW PROCESS FROM NODE 2310.00 TO NODE 23.10 IS CODE = 41

END OF STUDY SUMMARY:
TOTAL AREA (ACRES) = 4.45 TC (MIN.) = 11.78
PEAK FLOW RATE (CFS) = 10.19

END OF RATIONAL METHOD ANALYSIS
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2323</td>
<td>2322</td>
<td>1,350.0</td>
<td>1,300.0</td>
<td>100.0</td>
<td>0.46</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>2322</td>
<td>2321</td>
<td>1,300.0</td>
<td>950.0</td>
<td>715.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2322</td>
<td>2321</td>
<td>5</td>
<td>950.0</td>
<td>715.0</td>
<td>0.46</td>
<td>2.78</td>
<td></td>
</tr>
<tr>
<td>2321</td>
<td>2320</td>
<td>5</td>
<td>810.0</td>
<td>715.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2321</td>
<td>2320</td>
<td>8</td>
<td>810.0</td>
<td>50.0</td>
<td>0.42</td>
<td>4.83</td>
<td></td>
</tr>
<tr>
<td>2320</td>
<td>23.2</td>
<td>4</td>
<td>810.0</td>
<td>808.0</td>
<td></td>
<td>7.9</td>
<td>Total Area</td>
</tr>
</tbody>
</table>

Existing 24" CMP culvert
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

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES:</th>
<th>MANNING WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/ OUT-/ PARK-</th>
<th>SIDE WAY</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>LIFF</th>
<th>HIKE</th>
<th>FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30.0</td>
<td>20.0</td>
<td>0.018/0.018/0.020</td>
<td>0.67</td>
<td>2.00</td>
<td>0.0313</td>
<td>0.167</td>
<td>0.0150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.*

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 <<<<
>> TRAVEL TIME 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 = 2.240 (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 <<<<
>> TRAVEL TIME 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 2321.00 TO NODE 2320.00 IS CODE = 81
FLOW PROCESS FROM NODE 2320.00 TO NODE 23.20 IS CODE = 41

>>> COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA <<<
>>> USING USER-SPECIFIED PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2333</td>
<td>2332</td>
<td>1,270.0</td>
<td>1,195.0</td>
<td>100.0</td>
<td>0.46</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>2333</td>
<td>2331</td>
<td>1,195.0</td>
<td>925.0</td>
<td>515.0</td>
<td>0.46</td>
<td>2.23</td>
<td></td>
</tr>
<tr>
<td>2331</td>
<td>2330</td>
<td>925.0</td>
<td>810.0</td>
<td>700.0</td>
<td>0.43</td>
<td>4.94</td>
<td></td>
</tr>
<tr>
<td>2330</td>
<td>23.3</td>
<td>810.0</td>
<td>808.0</td>
<td>54.0</td>
<td></td>
<td></td>
<td>Existing 18&quot;CMP Culvert</td>
</tr>
</tbody>
</table>

7.49 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

FILE NAME: MERR233.DAT

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 USE 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)
=== ====== ========= ================= ====== ===== ======== ====== ======== ====== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ======== =====###
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<<

TRAVEL TIME 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 = 0.2262 (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 = 0.4600
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<<

TRAVEL TIME 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 = 0.1421 (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 = 0.4320
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 PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
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<td>10.41</td>
<td>Total Area</td>
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</tbody>
</table>

Existing 24"CMP Culvert
Analysis prepared by:
FUSCO 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

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
NO. WIDTH CROSSFALL IN- / OUT- / PARK- HEIGHT WIDTH LIP HIKE FACTOR
===  ===== =========  ================  ======  ===== ====== ===== ========
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.*

WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!

FLOW PROCESS FROM NODE  2343.00 TO NODE  2342.00 IS CODE = 21

USER SPECIFIED( SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = 0.3410
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!
MERR234.TXT

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<<<
>>> TRAVEL TIME 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 = 0.1771 (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.) = 18.51 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 <<<
>>> TRAVEL TIME 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 = 0.1195 (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 PIPE SIZE (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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
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24.624 Total Area
MERR23.TXT

*****************************************************************************
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 # 23                                                            *
* 2469.01A - OCTOBER 2006                                                  *
**************************************************************************

FILE NAME: MERR23.DAT

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-  HEIGH T  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!
MERR23.TXT

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<<<<<
>>>>>TRAVEL TIME 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 =  2.90 (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<<<<<
>>>>>TRAVEL TIME 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 =  0.1059 (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

****************************************************************************
Page 2
FLOW PROCESS FROM NODE  2300.00 TO NODE     23.00 IS CODE =  41

>>> COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<
>>> USING USER-SPECIFIED PIPE SIZE (EXISTING ELEMENT) <<<

ELEVATION DATA: UPSTREAM(FT) =   808.00  DOWNSTREAM(FT) =   801.00
FLOW LENGTH(FT) = 100.00  MANNING'S N =  0.024
DEPTH OF FLOW IN 36.0 INCH PIPE IS  19.2 INCHES
PIPE FLOW VELOCITY(FT/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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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10.66 Total Area
MERR241.TXT

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
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-DEFIN ED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*

HALF- CROWN TO STREET- CROSSFALL: CURB GUTTER- GEOMETRIES: MANNING
WIDTH CROSSFALL IN-/ OUT-/ PARK- HEIGH T 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/ft)

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

FLOW PROCESS FROM NODE 2410.00 TO NODE 24.10 IS CODE = 81

100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 4.465
*USER SPECIFIED (SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = 0.4200
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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<th>Node to Node</th>
<th>Code</th>
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9.02 Total Area
FILE NAME: MERR242.DAT

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
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-----------------
--------------TRAVEL TIME 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 = 0.1526 (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

--------------ADD DELI 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-----------
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
(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
## Merriam Mountains - Existing Hydrology

### October 2006

**Job Name:** Merriam Mountains - Existing Hydrology  
**Date:** October 2006  
**Job #:** 2469.01A  
**Run Name:** MERR24  
**Page 1**

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33.48
**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 # 24 *
* 2469.01A - OCTOBER 2006 *
**************************************************************************

FILE NAME: MERR24.DAT

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<<<

*RUSER 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!
FLOW PROCESS FROM NODE 2402.00 TO NODE 2401.00 IS CODE = 53

>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<

>> TRAVEL TIME 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 = 0.2295 (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 = 0.4600
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<<<

>> TRAVEL TIME 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 = 0.1781 (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 = 0.4430
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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FILE NAME: MERR25.DAT

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:

<table>
<thead>
<tr>
<th>NO.</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>IN- / OUT-/ PARK-</th>
<th>HEIGHT</th>
<th>WIDTH</th>
<th>LIP</th>
<th>HiKE FACTOR</th>
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<td>20.0</td>
<td>0.018/0.018/0.020</td>
<td>0.67</td>
<td>2.00</td>
<td>0.0313</td>
<td>0.167</td>
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</table>

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)

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

FLOW PROCESS FROM NODE 2531.80 TO NODE 2531.60 IS CODE = 81

FLOW PROCESS FROM NODE 2531.60 TO NODE 2531.40 IS CODE = 53

FLOW PROCESS FROM NODE 2531.60 TO NODE 2531.40 IS CODE = 81

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

FLOW PROCESS FROM NODE 2531.60 TO NODE 2531.40 IS CODE = 81

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 2531.00 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) = 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 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) = 800.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 1055.00 CHANNEL SLOPE = 0.0245
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0245 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA (CFS) = 105.02
FLOW VELOCITY (FEET/SEC) = 2.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME (MIN.) = 3.57 TC (MIN.) = 18.66
LONGEST FLOWPATH FROM NODE 2532.00 TO NODE 2530.00 = 3265.00 FEET.

FLOW PROCESS FROM NODE 2530.00 TO NODE 2502.00 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
ELEVATION DATA: UPSTREAM (FEET) = 915.00  DOWNSTREAM (FEET) = 835.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 1820.00  CHANNEL SLOPE = 0.0440

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

FLOW PROCESS FROM NODE 2506.00 TO NODE 2505.80 IS CODE = 21

*USER SPECIFIED (SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LIGHT (FEET) = 75.00
UPSTREAM ELEVATION (FEET) = 1330.00
DOWNSTREAM ELEVATION (FEET) = 1255.00
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

FLOW PROCESS FROM NODE 2505.80 TO NODE 2505.60 IS CODE = 81

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

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 2505.40 TO NODE 2505.00 IS CODE = 53

COMPUTE NATURAL MOUNTAIN CHANNEL FLOW

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 2505.00 TO NODE 2504.00 IS CODE = 53

COMPUTE NATURAL MOUNTAIN CHANNEL FLOW
**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:** 0.1176  
(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**

**100 YEAR RAINFALL INTENSITY (INCH/HOUR):** 4.009

*USER SPECIFIED (SUBAREA):*

**RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT:** 0.4200

**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:** 0.3500

**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

**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<<<<<**

**>>>> TRAVEL TIME 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

FLOW PROCESS FROM NODE 2520.60 TO NODE 2520.40 IS CODE = 53

FLOW PROCESS FROM NODE 2520.00 TO NODE 2520.40 IS CODE = 53

FLOW PROCESS FROM NODE 2520.40 TO NODE 2520.00 IS CODE = 53
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

FLOW PROCESS FROM NODE 2520.00 TO NODE 2504.00 IS CODE = 53

FLOW PROCESS FROM NODE 2504.00 TO NODE 2504.00 IS CODE = 1

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 2521.00 TO NODE 2504.00 = 2870.00 FEET.

FLOW PROCESS 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<<<<
>>>>>TRAVEL TIME 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<<<<
>>>>>TRAVEL TIME 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.) = 5.21
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 8.98
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

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 = 0.1908 (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.

ADDITION OF SUBAREA TO MAINLINE PEAK FLOW

*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

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 = 0.1558 (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

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

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

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 2510.40 TO NODE 2510.00 IS CODE = 81

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

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

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 2510.40 TO NODE 2510.00 IS CODE = 81

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

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

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 2510.40 TO NODE 2510.00 IS CODE = 81

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

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
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

FLOW PROCESS FROM NODE 2501.00 TO NODE 25.20 IS CODE = 53

FLOW PROCESS FROM NODE 2530.00 TO NODE 25.20 IS CODE = 81

TRAVEL TIME THRU SUBAREA = 2.02  Tc (MIN.) = 25.50
LONGEST FLOWPATH FROM NODE 2506.00 TO NODE 25.20 = 6355.00 FEET.

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 = 0.0152 (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 2501.00 = 5695.00 FEET.

FLOW PROCESS FROM NODE 2511.00 TO NODE 2501.00 IS CODE = 1

FLOW PROCESS FROM NODE 2501.00 TO NODE 25.20 IS CODE = 53

FLOW PROCESS FROM NODE 2530.00 TO NODE 25.20 IS CODE = 81

FLOW PROCESS FROM NODE 2530.00 TO NODE 25.20 IS CODE = 81

ADDITION OF SUBAREA TO MAINLINE PEAK FLOW = 198.86
TOTAL AREA (ACRES) = 131.22  TOTAL RUNOFF (CFS) = 492.61

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) = 492.61  TOTAL RUNOFF (CFS) = 603.87
TC(MIN.) = 25.50

FLOW PROCESS FROM NODE 25.20 TO NODE 25.00 IS CODE = 53

FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 10

FLOW PROCESS FROM NODE 25.06 TO NODE 25.05 IS CODE = 53

FLOW PROCESS FROM NODE 25.05 TO NODE 25.05 IS CODE = 81

FLOW PROCESS FROM NODE 25.07 TO NODE 25.06 IS CODE = 21

FLOW PROCESS FROM NODE 25.25 TO NODE 25.00 IS CODE = 53

FLOW PROCESS FROM NODE 25.20 TO NODE 25.15 IS CODE = 53
*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<<<
```

```
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 = 0.1907 (PER LACFCD/RCFC&WCMD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 10.75
FLOW VELOCITY(FeET/SEC) = 5.39 (PER LACFCD/RCFC&WCMD 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!**

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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 <<<<<

TOTAL AREA (ACRES) = 0.09  TOTAL RUNOFF (CFS) = 0.37

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 = 0.4200
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 <<<<<

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 = 0.4200
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 <<<<<
>>> TRAVEL TIME 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 LACFCDF/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA (CFS) = 81.67
FLOW VELOCITY (FEET/SEC) = 5.05 (PER LACFCDF/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)
LONGEST FLOWPATH FROM NODE 2506.00 TO NODE 25.00 = 7304.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>589.78</td>
<td>23.30</td>
<td>3.417</td>
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<tr>
<td>2</td>
<td>676.93</td>
<td>27.70</td>
<td>3.057</td>
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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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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</thead>
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**Total Area**: 174.25
# MERR26.TXT

**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


--- 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*

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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!
MERR26.TXT

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 <<<<<
>>>>> TRAVEL TIME 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 = .0000 (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 <<<<<
>>>>> TRAVEL TIME 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<<<<<
>>TRAVEL TIME 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 2603.00 TO NODE 2602.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>TRAVEL TIME 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) = 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 = 81

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>TRAVEL TIME 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 2602.00 TO NODE 2601.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>TRAVEL TIME THRU SUBAREA<<<<<

Page 3
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 = 0.0352 (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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.883
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = 0.2500
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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.609
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = 0.3800
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
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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.
6390 GREENWICH DRIVE, SUITE 170
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*

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<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>LIP</th>
<th>HIKE</th>
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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!

Page 1
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<<<<

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 = 0.1239 (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 = 0.3500
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<<<<

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 = 0.1063 (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 = 0.3500
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

---------------------------------------------------------------------------------------------------------------------
FLOW PROCESS FROM NODE  2772.00 TO NODE  2771.00 IS CODE =  53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVEL TIME 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, 10.0%, 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<<<<<
>>>>>TRAVEL TIME 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

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

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
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 <<<

ELEVATION DATA: UPSTREAM (FEET) = 1400.00
                DOWNSTREAM (FEET) = 1350.00
                  CHANNEL LENGTH THRU SUBAREA (FEET) = 300.00
                        CHANNEL SLOPE = .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 <<<

ELEVATION DATA: UPSTREAM (FEET) = 1350.00
                DOWNSTREAM (FEET) = 1300.00
                  CHANNEL LENGTH THRU SUBAREA (FEET) = 425.00
                        CHANNEL SLOPE = .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. CURVE NUMBER (AMC II) = 0
  AREA-AVERAGE RUNOFF COEFFICIENT = .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 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 **

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<td>10.48</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

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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 <<<
>>> TRAVEL TIME 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

FLOW PROCESS FROM NODE  2770.00 TO NODE  2761.00 IS CODE =  53

FLOW PROCESS FROM NODE  2761.00 TO NODE  2761.00 IS CODE =  1

FLOW PROCESS FROM NODE  2765.00 TO NODE  2764.00 IS CODE =  21
MERR27.TXT

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 <<<<<
>>>>> TRAVEL TIME 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 2763.00 TO NODE 2762.00 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 <<<<<
>>>>> TRAVEL TIME 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
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* 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
====================================================================================

* 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
====================================================================================

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
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.
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

FLOW PROCESS FROM NODE 2761.00 TO NODE 2760.00 IS CODE = 81

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/RFCFT&CD HYDROLOGY MANUAL
CHANNEL FLOW THRU SUBAREA (CFS) = 127.67
FLOW VELOCITY (FEET/SEC) = 6.80 PER LACFCD/RFCFT&CD 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 2760.00 TO NODE 2740.00 IS CODE = 53

FLOW PROCESS FROM NODE 2760.00 TO NODE 2740.00 IS CODE = 81

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/RFCFT&CD HYDROLOGY MANUAL
CHANNEL FLOW THRU SUBAREA (CFS) = 139.22
FLOW VELOCITY (FEET/SEC) = 6.01 PER LACFCD/RFCFT&CD HYDROLOGY MANUAL
TRAVEL TIME (MIN.) = 2.58 Tc (MIN.) = 21.46
LONGEST FLOWPATH FROM NODE 2775.00 TO NODE 2740.00 = 5770.40 FEET.
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 <<<

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<<<<<<

**FLOW TIME 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 = 0.1045 (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 = 0.2600
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**
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>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW
>>> TRAVEL TIME 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

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
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

TRAVEL TIME 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

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 = 0.0923 (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 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:
100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.86
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 2732.00 TO NODE 2731.00 IS CODE = 21

RATIONAL METHOD INITIAL SUBAREA ANALYSIS

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*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<<<
>>>TRAVEL TIME 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 = 0.1502 (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<<<
>>>TRAVEL TIME 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 = 0.1861 (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<<<

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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

FLOWS 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.

FLOWS PROCESS FROM NODE 2710.00 TO NODE 2710.50 IS CODE = 53

>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW <<<<<
TRAVEL TIME 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 = 1.063 (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.

FLOWS 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

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*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<<<<
crud

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/RCFCD&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 53.32
FLOW VELOCITY(FEET/SEC) = 7.35 (PER LACFCD/RCFCD&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
******************************************************************************

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-LINE PEAK FLOW<<<<

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF(CFS)</th>
<th>Tc(MIN.)</th>
<th>INTENSITY(INCH/HOUR)</th>
<th>AREA(ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>65.96</td>
<td>18.30</td>
<td>3.993</td>
<td>65.35</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2732.00 TO NODE 27.00 = 3235.00 FEET.

** 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

Page 17
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
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
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Total Area: 107.36
Analysis prepared by:

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

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*

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<th>NO.</th>
<th>(FT)</th>
<th>(FT)</th>
<th>SIDE / SIDE/ WAY</th>
<th>(FT)</th>
<th>(FT)</th>
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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**

- ELEVATION DATA: UPSTREAM(Feet) = 1695.00 DOWNSTREAM(Feet) = 1430.00
- CHANNEL LENGTH THRU SUBAREA(Feet) = 517.00
- CHANNEL SLOPE = 0.5126
- EFFECTIVE SLOPE = .2256 (PER LACFCD/RCFC&WC&D 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&WC&D 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<<<<<<

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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

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

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 = 0.2800
SUBAREA AREA(ACRES) = 7.25   SUBAREA RUNOFF(CFS) = 10.73
TOTAL AREA(ACRES) = 20.1   TOTAL RUNOFF(CFS) = 30.53
TC(MIN.) = 14.49

FLOW PROCESS FROM NODE 2810.00 TO NODE 2809.00 IS CODE = 81
MERR28.TXT

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 = 0.3500
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 <<<<

ELEVATION DATA: UPSTREAM (FEET) = 1705.00 DOWNSTREAM (FEET) = 1500.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 455.00 CHANNEL SLOPE = 0.4505
EFFECTIVE SLOPE = 0.2201 (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 = 0.3500
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
MERR28.TXT

>>>'+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

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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<<<<<
>>>>>TRAVEL TIME 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/HOUR) = 4.12
TOTAL STREAM AREA(ACRES) = 53.69
PEAK FLOW RATE(CFS) AT CONFLUENCE = 66.05

** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tr>
<td>1</td>
<td>64.76</td>
<td>17.48</td>
<td>4.114</td>
<td>53.67</td>
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<td>2</td>
<td>66.05</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tr>
<td>1</td>
<td>130.60</td>
<td>17.42</td>
<td>4.123</td>
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<tr>
<td>2</td>
<td>130.67</td>
<td>17.48</td>
<td>4.114</td>
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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
MERR28.TXT

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

♦
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
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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

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.*

WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
**FLOW PROCESS FROM NODE 2926.00 TO NODE 2925.00 IS CODE = 53**

--------COMPUTE NATURAL MOUNTAIN CHANNEL FLOW--------

**ELEVATION DATA:**  
UPSTREAM (FEET) = 1570.00  DOWNSTREAM (FEET) = 1470.00

**CHANNEL LENGTH THROUGH SUBAREA (FEET) = 307.00  CHANNEL SLOPE = 0.3257

**SLOPE ADJUSTMENT CURVE USED:**
EFFECTIVE SLOPE = 0.3257 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

**NOTE:** CHANNEL FLOW OF 1.0 CFS WAS ASSUMED IN VELOCITY ESTIMATION

**CHANNEL FLOW THROUGH SUBAREA (CFS) = 0.53

**FLOW VELOCITY (FEET/SEC) = 2.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

**TNR = 2.04**

**TC (MIN.) = 8.30**

**LONGEST FLOWPATH FROM NODE 2927.00 TO NODE 2925.00 = 407.00 FEET.**

FLOW PROCESS FROM NODE 2925.00 TO NODE 2924.00 IS CODE = 53

--------COMPUTE NATURAL MOUNTAIN CHANNEL FLOW--------

**ELEVATION DATA:**  
UPSTREAM (FEET) = 1470.00  DOWNSTREAM (FEET) = 1390.00

**CHANNEL LENGTH THROUGH SUBAREA (FEET) = 520.00  CHANNEL SLOPE = 0.1538

**SLOPE ADJUSTMENT CURVE USED:**
EFFECTIVE SLOPE = 0.1369 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

**CHANNEL FLOW THROUGH SUBAREA (CFS) = 3.12

**FLOW VELOCITY (FEET/SEC) = 3.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

**TNR = 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) = 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 = 81

--------COMPUTE NATURAL MOUNTAIN CHANNEL FLOW--------

**ELEVATION DATA:**  
UPSTREAM (FEET) = 1470.00  DOWNSTREAM (FEET) = 1390.00

**CHANNEL LENGTH THROUGH SUBAREA (FEET) = 520.00  CHANNEL SLOPE = 0.1538

**SLOPE ADJUSTMENT CURVE USED:**
EFFECTIVE SLOPE = 0.3257 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

**CHANNEL FLOW THROUGH SUBAREA (CFS) = 3.12

**FLOW VELOCITY (FEET/SEC) = 3.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

**TNR = 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<<<<<
>>>>>TRAVEL TIME 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 = 0.0554 (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 = 0.3480
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<<<<<
>>>>>TRAVEL TIME 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 = 0.0567 (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 = 0.4290
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<<<<<
>>>>>TRAVEL TIME THRU SUBAREA<<<<<

Page 3
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/RCF&FCWCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 76.05
FLOW VELOCITY(Feet/Sec) = 10.55 (PER LACFCD/RCF&FCWCD 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

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

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

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
TRAVEL TIME 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

COMPUTE NATURAL MOUNTAIN CHANNEL FLOW
TRAVEL TIME 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<<<<
>>>>>TRAVEL TIME 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  2911.00 TO NODE  2910.00 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  2910.00 TO NODE  2909.00 IS CODE =  53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>>TRAVEL TIME 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.
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

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/RCF&C WD 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

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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<th>Node to Node</th>
<th>Code</th>
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<td>54.15</td>
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Total Area: 107.83
**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*

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<th>OUT-</th>
<th>WAY</th>
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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
**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<<<**

**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 = 0.2222 (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<<<**

**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

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
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<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
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37.94 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 # 31
* 2469.01A - OCTOBER 2006
**************************************************************************

FILE NAME: MERR31.DAT

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 = 0.3500
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<<<
>>> TRAVEL TIME 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 = 0.2195 (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 <<<
>>> TRAVEL TIME 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 = 0.1655 (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:

Page 2
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
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<th>Node to Node</th>
<th>Code</th>
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<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff.</th>
<th>Area (ac.)</th>
<th>Comments</th>
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|                      |      |               |               |               |               | 136.24   | Total Area |
*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*

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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
**MERR32.TXT**

**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<<<**
**>> TRAVEL TIME 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<<<**
**>> TRAVEL TIME 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** 3213.00 = 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<<<<<

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/RFCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 53.91
FLOW VELOCITY(FEET/SEC) = 8.11 (PER LACFCD/RFCFC&WCD HYDROLOGY MANUAL)
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<<<<<

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.

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

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
MERR32.TXT

>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<
>>>TRAVEL TIME 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 = 0.1862 (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<<<<<<
<<<<<<TRAVEL TIME 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 = 0.1501 (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 3204.00 TO NODE 3204.00 IS CODE = 1

<<<<<<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 <<<<<<

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 = 0.1786 (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 3205.00 TO NODE 3204.00 IS CODE = 53

>>>>> 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 <<<<<<

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 = 0.1897 (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

>>ADDITON 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<<<

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 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 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<<<

>>TRAVEL TIME 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

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

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

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
MERR32.TXT

*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

>>>>>TRAVEL TIME 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

Page 9
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)
1 221.01 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
PEAK FLOW RATE (CFS) = 231.83

END OF RATIONAL METHOD ANALYSIS
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<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>Runoff Coeff</th>
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35.6 Total Area
MERR33.TXT

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) (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

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.) = 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

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<<<<

<<<<<<<<TRAVEL TIME 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
## Node to Node | Code | Elev 1 (feet) | Elev 2 (feet) | Length (feet) | Runoff Coeff. | Area (ac.) | Comments |
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97.55 Total Area
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*

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<th>Width</th>
<th>Lip</th>
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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!
MERR34.TXT

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<<<<
>>>>>TRAVEL TIME 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 3402.60 TO NODE 3402.00 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<<<<
>>>>>TRAVEL TIME 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<<<<<
>>>>>TRAVEL TIME 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<<<<<
>>>>>TRAVEL TIME 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
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47.03 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 - 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!
MERR35-P.TXT

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<<<

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 = 0.1433 (PER LACFCDF/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 1.32
FLOW VELOCITY(Feet/SEC) = 2.32 (PER LACFCDF/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 = 0.3500
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<<<

ELEVATION DATA: UPSTREAM(FEET) = 1035.00 DOWNSTREAM(FEET) = 905.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 340.00 CHANNEL SLOPE = 0.2407
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = 0.1769 (PER LACFCDF/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 7.60
FLOW VELOCITY(Feet/SEC) = 4.63 (PER LACFCDF/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.

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Node to Node BANK 1 2 3

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 Greenwhich Drive  
Suite 170  
San Diego, California 92122  

******************************************************************************  
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*  

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<th>CROSSFALL (FT)</th>
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<th>WIDTH (FT)</th>
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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
TRAVEL TIME 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
P-10.TXT

>>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
Page 5
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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>68.66</td>
<td>9.17</td>
<td>6.235</td>
<td>31.46</td>
</tr>
<tr>
<td>2</td>
<td>108.34</td>
<td>9.51</td>
<td>6.092</td>
<td>50.81</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>173.17</td>
<td>9.17</td>
<td>6.235</td>
</tr>
<tr>
<td>2</td>
<td>175.42</td>
<td>9.51</td>
<td>6.092</td>
</tr>
</tbody>
</table>

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) = 18.000   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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning’s FRICITION 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
P-10.TXT

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

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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

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 PIPE SIZE (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 <<<

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
- HALFWIDTH FLOOD WIDTH(FEET) = 4.64
- AVERAGE FLOW VELOCITY(FT/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) = 9.22

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(FT) = 0.25  HALFWIDTH FLOOD WIDTH(FEET) = 6.18
- FLOW VELOCITY(FT/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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.61</td>
<td>6.71</td>
<td>7.630</td>
<td>1.22</td>
</tr>
<tr>
<td>2</td>
<td>3.40</td>
<td>3.97</td>
<td>9.222</td>
<td>0.41</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.35</td>
<td>3.97</td>
<td>9.222</td>
</tr>
</tbody>
</table>
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

FLOW LENGTH (FEET) = 60.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.00
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

** 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)
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
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<<<<

Page 19
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
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
DEPT 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 <<<
>>> TRAVEL TIME 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/HOUR) = 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 39.85 6.83 7.544 4.29
2 41.14 7.60 7.040 9.34

** 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<<<<

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

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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 = 0.3500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.60
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
P-10.TXT

>>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<<

>>>>> TRAVEL TIME 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 = 2.00
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)

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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
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

============================================================================
FLOW PROCESS FROM NODE 1018.00 TO NODE 1017.00 IS CODE = 51

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
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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

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
S.C.S. CURVE NUMBER (AMC II) = 0
USER SPECIFIED (SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .3500
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

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>76.58</td>
<td>7.76</td>
<td>6.943</td>
</tr>
<tr>
<td>2</td>
<td>81.75</td>
<td>8.45</td>
<td>6.573</td>
</tr>
</tbody>
</table>

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 <<<

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

FLOW PROCESS FROM NODE 1056.00 TO NODE 1055.00 IS CODE = 31
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

CHANNEL LENGTH THRU SUBAREA(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**

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**

ELEVATION DATA: UPSTREAM (FEET) = 1539.00  
DOWNSTREAM (FEET) = 1535.00  
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FLOW LENGTH (FEET) = 45.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.00
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 <<<
>>> TRAVEL TIME 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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12.19</td>
<td>7.72</td>
<td>6.968</td>
<td>5.00</td>
</tr>
<tr>
<td>2</td>
<td>11.19</td>
<td>7.10</td>
<td>7.357</td>
<td>4.22</td>
</tr>
</tbody>
</table>

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) |
|---------------|-------------|----------|----------------------|-------------|

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<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22.40</td>
<td>7.10</td>
<td>7.357</td>
</tr>
<tr>
<td>2</td>
<td>22.79</td>
<td>7.72</td>
<td>6.968</td>
</tr>
</tbody>
</table>

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<<<<
>>>>>TRAVEL TIME 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  HALF STREET 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.37</td>
<td>4.24</td>
<td>9.222</td>
<td>1.25</td>
</tr>
<tr>
<td>2</td>
<td>8.83</td>
<td>7.39</td>
<td>7.167</td>
<td>2.37</td>
</tr>
</tbody>
</table>
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 **
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

FLOW PROCESS FROM NODE 1053.00 TO NODE 1015.00 IS CODE = 51

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 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

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)
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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 OFPIPES = 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.

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 18.00
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 **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
</tbody>
</table>

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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

FLOW PROCESS FROM NODE 1005.00 TO NODE 1004.00 IS CODE = 51

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 = 2.00
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 = 0.3000
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

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 <<<

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>439.16</td>
<td>10.67</td>
<td>5.654</td>
<td>212.54</td>
</tr>
<tr>
<td>2</td>
<td>53.87</td>
<td>7.34</td>
<td>7.199</td>
<td>23.35</td>
</tr>
</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>355.86</td>
<td>7.34</td>
<td>7.199</td>
</tr>
<tr>
<td>2</td>
<td>481.47</td>
<td>10.67</td>
<td>5.654</td>
</tr>
</tbody>
</table>

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 1003.00 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
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.1 INCHES
PIPE-FLOW VELOCITY(FeET/SEC.) = 14.98
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.1 INCHES
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<<<<<

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*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 CONFLUEDBED 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>11.58</td>
<td>7.92</td>
<td>6.854</td>
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</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
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<tr>
<td>1</td>
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<td>6.854</td>
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<tr>
<td>2</td>
<td>19.53</td>
<td>10.10</td>
<td>5.858</td>
</tr>
</tbody>
</table>

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 <<<<<
>>> TRAVEL TIME 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
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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

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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

>>>>>(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 <<<

FLOW LENGTH(FT) = 340.00 MANNING'S N = 0.013
ELEVATION DATA: UPSTREAM(FT) = 1457.00 DOWNSTREAM(FT) = 1450.90
FLOW LENGTH(FT) = 340.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 12.5 INCHES
PIPE-FLOW VELOCITY(FT/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(FT) = 80.00
UPSTREAM ELEVATION(FT) = 1493.00
DOWNSTREAM ELEVATION(FT) = 1491.00
ELEVATION DIFFERENCE(FT) = 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

>>IMAGEDESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>IMAGEAND 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
      (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
      (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

>>IMAGECOMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>IMAGEUSING COMPUTER-ESTIMATED PIPE SIZE (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 OFPIPES = 1

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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 = 0.5200
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 = 0.5200
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 **

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<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
<tr>
<td>1</td>
<td>30.97</td>
<td>9.71</td>
<td>6.012</td>
<td>9.59</td>
</tr>
<tr>
<td>2</td>
<td>4.48</td>
<td>9.58</td>
<td>6.061</td>
<td>1.42</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

STREAM | RUNOFF | Tc | INTENSITY

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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
  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<<<

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

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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

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

STREAM NUMBER RUNOFF Tc INTENSITY AREA
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 NUMBER RUNOFF Tc INTENSITY
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)
P-10.TXT

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 OFPIPES = 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

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LONGEST FLOWPATH FROM NODE 106.00 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<<<

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

>>>>> DESIGNEATE 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 **
<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
</tr>
<tr>
<td>1</td>
<td>49.42</td>
<td>7.69</td>
<td>6.987</td>
</tr>
<tr>
<td>2</td>
<td>58.97</td>
<td>10.81</td>
<td>5.609</td>
</tr>
</tbody>
</table>

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
P-10.TXT

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

FLOW PROCESS FROM NODE 1115.00 TO NODE 1114.00 IS CODE = 21

FLOW PROCESS FROM NODE 1114.00 TO NODE 1113.00 IS CODE = 62

UPSTREAM ELEVATION(FeET) = 1280.00 DOWNSTREAM ELEVATION(FeET) = 1278.00
P-10.TXT

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(DECMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECMAL) = 0.020

SPECIFIED NUMBER OF HALSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECMAL) = 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 = 0.5100
  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(DECMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECMAL) = 0.020
Manning's FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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
- HALFWAY STREET 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
- HALFWAY STREET 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**

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.05</td>
<td>9.76</td>
<td>5.992</td>
<td>0.90</td>
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<tr>
<td>2</td>
<td>9.30</td>
<td>9.24</td>
<td>6.206</td>
<td>2.94</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

**PEAK FLOW RATE TABLE**

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12.20</td>
<td>9.24</td>
<td>6.206</td>
</tr>
<tr>
<td>2</td>
<td>12.04</td>
<td>9.76</td>
<td>5.992</td>
</tr>
</tbody>
</table>
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

FLOW PROCESS FROM NODE 1112.00 TO NODE 1082.00 IS CODE = 51

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.

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23.55</td>
<td>10.47</td>
<td>5.726</td>
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LONGEST FLOWPATH FROM NODE 1115.00 TO NODE 1082.00 = 1570.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>64.32</td>
<td>12.85</td>
<td>5.017</td>
<td>31.48</td>
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LONGEST FLOWPATH FROM NODE 1106.00 TO NODE 1082.00 = 3695.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>75.96</td>
<td>10.47</td>
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<tr>
<td>2</td>
<td>84.96</td>
<td>12.85</td>
<td>5.017</td>
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</table>

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

** 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

FLOW PROCESS FROM NODE 1071.00 TO NODE 1002.00 IS CODE = 51
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

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** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>136.47</td>
<td>9.26</td>
<td>6.196</td>
</tr>
<tr>
<td>2</td>
<td>188.49</td>
<td>15.05</td>
<td>4.530</td>
</tr>
</tbody>
</table>

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.

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>188.49</td>
<td>15.05</td>
<td>4.530</td>
<td>127.13</td>
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</tbody>
</table>

LONGEST FLOWPATH FROM NODE 1106.00 TO NODE 1002.00 = 5950.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
<tbody>
<tr>
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<td>541.86</td>
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</table>

LONGEST FLOWPATH FROM NODE 1035.00 TO NODE 1002.00 = 7095.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>698.45</td>
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</tr>
<tr>
<td>2</td>
<td>669.27</td>
<td>15.05</td>
<td>4.530</td>
</tr>
</tbody>
</table>

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) = 698.45  Tc (MIN.) = 12.50
TOTAL AREA (ACRES) = 431.1
TRAVEL TIME 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 = 0.2700
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.

COMPUTE PIPE- FLOW TRAVEL TIME THRU SUBAREA

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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
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21.56
Analysis prepared by:
Fuscoe Engineering
6390 Greenwich Dr.
Suite 170
San Diego, CA 92122

************* DESCRIPTION OF STUDY *************

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
>>> TRAVEL TIME 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 = 0.3000
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
>>> TRAVEL TIME 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 = 0.3000
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 <<<<<
TRAVEL TIME 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
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 **

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<th>STREAM NUMBER</th>
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<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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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 <<<

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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<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
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<td>665</td>
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<td>Ex 36&quot; RCP Caltrans</td>
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</table>

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
********** DESCRIPTION OF STUDY **********

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN-/OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR</th>
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<tr>
<td>1</td>
<td>18.0</td>
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</table>

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  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
  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

*USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.94
  STREET FLOW DEPTH(FT) =  0.36
  HALFSTREET FLOOD WIDTH(FT) =  11.66
  AVERAGE FLOW VELOCITY(FT/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
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
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 <<<<<

Page 4
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.

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.

** 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.

** 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.

** 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 **
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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.

** 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.

** 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.

** 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.

** 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.

** 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.
>>>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<<<<

============================================================================

ELEVATION DATA: UPSTREAM(Feet) = 1274.00 DOWNSTREAM(Feet) = 1269.00
CHANNEL LENGTH THRU SUBAREA(Feet) = 335.00 CHANNEL SLOPE = 0.0149
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
**RATIONAL METHOD INITIAL SUBAREA ANALYSIS**

*USER SPECIFIED(SUBAREA):
- USER-SPECIFIED RUNOFF COEFFICIENT = 0.5100
- 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
- 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**

- 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 = 0.5100
- 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
----------------------------------------------------------------------------

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 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
----------------------------------------------------------------------------

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 <<<
>>> TRAVEL TIME 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
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

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

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>>>
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

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>>>
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

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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<<<<
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 = 0.5100
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 = 0.5600
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   HALFWIDTH STREET 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

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>>> 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

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>>> 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
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.8 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 35.84
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.8 INCHES
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

FLOW PROCESS FROM NODE 2563.00 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

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

 Преобразованный прямоугольник

 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

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 = .510
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

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

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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
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(FT) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FT) = 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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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(FT) = 0.29
HALFSTREET FLOOD WIDTH(FT) = 8.11
AVERAGE FLOW VELOCITY(FT/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(ACRE) = 1.96 SUBAREA RUNOFF(CFS) = 6.80
TOTAL AREA(ACRE) = 2.1 PEAK FLOW RATE(CFS) = 7.25

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FT) = 0.34 HALFSTREET FLOOD WIDTH(FT) = 10.59
FLOW VELOCITY(FT/SEC.) = 2.92 DEPTH*VELOCITY(FT*FT/SEC.) = 0.99
LONGEST FLOWPATH FROM NODE 2561.00 TO NODE 2560.10 = 365.00 FT.

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(FT) = 1263.00 DOWNSTREAM(FT) = 1262.00
FLOW LENGTH(FT) = 160.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.6 INCHES
PIPE-FLOW VELOCITY(FT/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.
**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

**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

**COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA**

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150  
Manning’s FRICITION 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 CONFLUEDED 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.25</td>
<td>8.54</td>
<td>6.528</td>
<td>2.09</td>
</tr>
<tr>
<td>2</td>
<td>3.97</td>
<td>10.60</td>
<td>5.681</td>
<td>1.37</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.45</td>
<td>8.54</td>
<td>6.528</td>
</tr>
<tr>
<td>2</td>
<td>10.28</td>
<td>10.60</td>
<td>5.681</td>
</tr>
</tbody>
</table>

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

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

** 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

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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<<<<<

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<<<<<

ELEVATION DATA: UPSTREAM(Feet) = 1258.00  DOWNSTREAM(Feet) = 1257.80

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FLOW LENGTH (FEET) = 10.00  MANNING'S N = 0.013
DEPT 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

FLOW PROCESS FROM NODE 2554.00 TO NODE 2554.00 IS CODE = 1

FLOW PROCESS FROM NODE 2554.00 TO NODE 2554.00 IS CODE = 1

LONGEST FLOWPATH FROM NODE 2557.00 TO NODE 2554.00 = 563.00 FEET.

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 2554.00 IS CODE = 31

ELEVATION DATA: UPSTREAM (FEET) = 1257.80  DOWNSTREAM (FEET) = 1252.80

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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

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

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

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**

STREET 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

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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 HALFW STREET 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
----------------------------------------------------------------------------
P-13d.TXT

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>>> COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

>>> USING COMPUTER-ESTIMATED PIPE SIZE (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 OFPIPES = 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 INDEPENDENTSTREAM 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

-----------------------------------------------------------------------------

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FLOW PROCESS FROM NODE   1333.40 TO NODE   1332.00 IS CODE =  31

>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>::>: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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 HALFWESTREETS 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
HALFWESTreet 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 = 0.5100
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  HALFWESTREET 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

FLOW PROCESS FROM NODE 1335.00 TO NODE 1332.00 IS CODE = 31

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 18.000 INCH PIPE IS 3.9 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 6.67
ESTIMATED PIPE DIAMETER (INCH) = 18.000  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 = 0.5100
  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 flow depth (feet) = 0.24

Streetflow model results using estimated flow:
***

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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.) = 100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 6.259
Tc (MIN.) = 9.12

*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

>>IMAGE COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>IMAGE 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

>>IMAGE 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

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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) = 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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.97</td>
<td>9.89</td>
<td>5.940</td>
<td>0.93</td>
</tr>
<tr>
<td>2</td>
<td>7.72</td>
<td>7.54</td>
<td>7.072</td>
<td>2.10</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.98</td>
<td>7.54</td>
<td>7.072</td>
</tr>
<tr>
<td>2</td>
<td>9.45</td>
<td>9.89</td>
<td>5.940</td>
</tr>
</tbody>
</table>

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
P-13d.TXT

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

FLOW PROCESS FROM NODE 1330.00 TO NODE 1330.00 IS CODE = 11

** 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 <<<

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

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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
--- | --- | --- | --- | ---
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
--- | --- | --- | --- | ---
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
--- | --- | --- | ---
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<<<

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

UPSTREAM ELEVATION (FEET) = 1275.00 DOWNSTREAM ELEVATION (FEET) = 1272.00
STREET LENGTH (FEET) = 210.00 CURB HEIGHT (INCHES) = 6.0
STREET HALF WIDTH (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 1343.60 IS CODE = 31

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

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 18.00
DEPTH OF FLOW IN 18.00 INCH PIPE IS 9.00 INCHES
PIPE-FLOW VELOCITY(FT/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
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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 FRICITON FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITON 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

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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

FLOW LENGTH( FEET ) = 40.00
MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.00
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.6 INCHES
PIPE-FLOW VELOCITY( FEET/SEC. ) = 6.18
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

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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.27</td>
<td>9.24</td>
<td>6.205</td>
<td>1.86</td>
</tr>
<tr>
<td>2</td>
<td>5.14</td>
<td>8.43</td>
<td>6.585</td>
<td>1.38</td>
</tr>
</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.
### PEAK FLOW RATE TABLE

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.05</td>
<td>8.43</td>
<td>6.585</td>
</tr>
<tr>
<td>2</td>
<td>11.11</td>
<td>9.24</td>
<td>6.205</td>
</tr>
</tbody>
</table>

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 = 0.5100
- S.C.S. curve number (AMC II) = 0
- Initial subarea flow-length (FEET) = 80.00
- Upstream elevation (FEET) = 1275.00
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

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>>>>>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

>>>>(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

>>>>(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
** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.11</td>
<td>9.63</td>
<td>6.043</td>
<td>3.24</td>
</tr>
<tr>
<td>2</td>
<td>3.89</td>
<td>7.83</td>
<td>6.906</td>
<td>1.07</td>
</tr>
<tr>
<td>3</td>
<td>7.23</td>
<td>7.37</td>
<td>7.181</td>
<td>1.84</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20.24</td>
<td>7.37</td>
<td>7.181</td>
</tr>
<tr>
<td>2</td>
<td>20.56</td>
<td>7.83</td>
<td>6.906</td>
</tr>
<tr>
<td>3</td>
<td>20.60</td>
<td>9.63</td>
<td>6.043</td>
</tr>
</tbody>
</table>

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.
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(CF/S) = 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

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(CF/S) AT CONFLUENCE = 20.60

FLOW PROCESS FROM NODE 1347.90 TO NODE 1347.80 IS CODE = 21

*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(CF/S) = 0.37
TOTAL AREA(ACRES) = 0.10    TOTAL RUNOFF(CF/S) = 0.37

FLOW PROCESS FROM NODE 1347.80 TO NODE 1347.70 IS CODE = 62

UPSTREAM ELEVATION(Feet) = 1270.00    DOWNSTREAM ELEVATION(Feet) = 1269.00
STREET LENGTH(Feet) = 100.00    CURB HEIGHT(INCH) = 6.0
STREET HALFWIDTH(Feet) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADBREAK(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 <<<

Page 62
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

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

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

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.
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

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

ESTIMATED PIPE DIAMETER (INCH) = 18.00 DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.7 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 32.43
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

ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.00 DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.7 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 32.43
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.

Note: Peak flow rate defaulted to upstream value.
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

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

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

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

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

** PEAK FLOW RATE TABLE **
STREAM 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

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 1302.00 TO NODE 1302.00 IS CODE = 81

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
** MAIN STREAM CONFLUENCE DATA **

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LONGEST FLOWPATH FROM NODE 1339.00 TO NODE 1302.00 = 3455.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

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LONGEST FLOWPATH FROM NODE 1321.00 TO NODE 1302.00 = 3885.00 FEET.

** PEAK FLOW RATE TABLE **

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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 1302.00 IS CODE = 52

** COMPUTE NATURAL VALLEY CHANNEL FLOW **

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
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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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
NO.    WIDTH  CROSSFALL  IN-/OUT-/WAY  WIDTH  LIP  HIKE FACTOR
      (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/ft)
   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
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
>>> TRAVEL TIME 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 18.00 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 1508.00 TO NODE 1507.00 = 685.00 FEET.

FLOW PROCESS FROM NODE 1507.00 TO NODE 1506.00 IS CODE = 51

>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW
>>> TRAVEL TIME 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<<<<<<
<<<<<<TRAVEL TIME 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<<<<<<

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 LACFC/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 LACFC/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<<<<<<

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<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1260.00  DOWNSTREAM(FEET) = 902.00
  CHANNEL LENGTH THRU SUBAREA(_FEET) = 820.00  CHANNEL SLOPE = 0.4366
  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<<<<<

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
  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 **

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<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
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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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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*

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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOGRAPHIES: MANNING</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/OUT-/PARK-HEIGHT</th>
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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

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 1603.00 IS CODE = 7

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

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 18.00
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<<<<

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TRAVEL TIME 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 = 0.3000
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.

COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

FLOW PROCESS FROM NODE 1608.00 TO NODE 1602.00 IS CODE = 31

ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.00 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.

DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE

FLOW PROCESS FROM NODE 1602.00 TO NODE 1602.00 IS CODE = 1

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

Page 5
TOTAL STREAM AREA (ACRES) = 5.63
PEAK FLOW RATE (CFS) AT CONFLUENCE = 12.81

** CONFLUENCE DATA **

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

** PEAK FLOW RATE TABLE **

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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

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 = 0.2700
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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94.90
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*

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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>STREET-CROSSFALL</th>
<th>Curb Gutter-Geometries: Manning Width Crossfall</th>
<th>In-/Out-/Park- Height Width Lip Hike Factor</th>
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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

*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

TRAPEZOIDAL CHANNEL FLOW

ELEVATION DATA: UPSTREAM (FEET) = 1293.00  DOWNSTREAM (FEET) = 1275.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 930.00  CHANNEL SLOPE = 0.0194
MANNING'S FACTOR = 0.030  MAXIMUM DEPTH (FEET) = 10.00
100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 6.206

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 18.68
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

FLOW PROCESS FROM NODE 2023.00 TO NODE 2020.00 IS CODE = 31

PIPE-FLOW TRAVEL TIME THRU SUBAREA

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.34
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(Feet) = 0.17
  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
  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

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 **

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<tr>
<th>STREAM NUMBER</th>
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<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>INTENSITY (INCH/HOUR)</th>
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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
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
INCLINATION OF 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

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

** CONFLUENCE DATA **
STREAM RUNOFF  Tc   INTENSITY  AREA
NUMBER  (CFS)  (MIN.) (INCH/HOUR) (ACRE)
1   37.62   9.57   6.066   9.63

Page 5
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 | 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
>>> 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 OFPIPES = 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
>>> 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
>>> 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
Page 6
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)
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

FLOW PROCESS FROM NODE 1977.00 TO NODE 1977.00 IS CODE = 10

FLOW PROCESS FROM NODE 1989.00 TO NODE 1988.00 IS CODE = 21

*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

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 = 0.630
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 = 0.5900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH (FEET) = 80.00

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UPSTREAM ELEVATION (FEET) = 1228.00
DOWNSTREAM ELEVATION (FEET) = 1226.00
ELEVATION DIFFERENCE (FEET) = 2.00
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

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

LONGEST FLOWPATH FROM NODE 1986.00 TO NODE 1983.00 = 265.00 FEET.

FLOW PROCESS FROM NODE 1984.00 TO NODE 1983.00 IS CODE = 31

COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

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

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

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** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<td>1.27</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>8.27</td>
<td>6.664</td>
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</table>

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 <<<

>>> 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

FLOW PROCESS FROM NODE 1980.00 TO NODE 1979.00 IS CODE = 31

FLOW PROCESS FROM NODE 1979.00 TO NODE 1979.00 IS CODE = 1

** CONFLUENCE DATA **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

** PEAK FLOW RATE TABLE **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tr>
<td>1</td>
<td>36.69</td>
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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

FLOW PROCESS FROM NODE 1978.00 TO NODE 1978.00 IS CODE = 1

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

*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

FLOW PROCESS FROM NODE 1978.40 TO NODE 1978.20 IS CODE = 21

FLOW PROCESS FROM NODE 1978.20 TO NODE 1978.00 IS CODE = 62

FLOW PROCESS FROM NODE 1978.40 TO NODE 1978.20 IS CODE = 21
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 = 0.5900
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

**CONFLUENCE DATA**

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>6.911</td>
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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 VELOCITY(Feet/SEC.) = 11.46
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
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

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 1976.00 TO NODE 1976.00 IS CODE = 21

TOTAL AREA (ACRES) = 0.22
TOTAL RUNOFF (CFS) = 1.79

FLOW PROCESS FROM NODE 1976.20 TO NODE 1976.00 IS CODE = 62

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
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/HOUR) = 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 1975.00 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) = 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

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.

>>> COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

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.

>>> MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1

>>> 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

TRAVEL TIME 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
AVERAGE FLOW DEPTH (FEET) = 0.09 TRAVEL TIME (MIN.) = 5.49
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 PIPE SIZE (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 18.00
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 **
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 5.13 8.88 6.366 3.3
2 4.41 13.74 4.805 2.51

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

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 18.00
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 1971.00 TO NODE 1970.00 IS CODE = 21

*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<<<<<
TRAVEL TIME 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.

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

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

COMPUTE TRAPEZOIDAL CHANNEL FLOW

FLOW PROCESS FROM NODE 1951.00 TO NODE 1950.00 IS CODE = 51
FLOW PROCESS FROM NODE 1950.00 TO NODE 1969.00 IS CODE = 51

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*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

RESPONSE: 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
>>TRAVEL TIME 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

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**FLOW PROCESS FROM NODE 1956.00 TO NODE 1969.00 IS CODE = 31**

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**FLOW PROCESS FROM NODE 1969.00 TO NODE 1969.00 IS CODE = 1**

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**DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE**

AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES

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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 **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<td>13.98</td>
<td>8.23</td>
<td>6.688</td>
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</tbody>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33.45</td>
<td>8.01</td>
<td>6.803</td>
</tr>
<tr>
<td>2</td>
<td>33.83</td>
<td>8.23</td>
<td>6.688</td>
</tr>
<tr>
<td>3</td>
<td>32.72</td>
<td>9.67</td>
<td>6.027</td>
</tr>
</tbody>
</table>

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.
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.

** 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 = 11

FLOW PROCESS FROM NODE 1963.00 TO NODE 1959.00 IS CODE = 31

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

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

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

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

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

ELEVATION DATA: UPSTREAM (FEET) = 1326.00  DOWNSTREAM (FEET) = 1190.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 1185.00  CHANNEL SLOPE = 0.1148
MANNING'S FACTOR = 0.030  "Z" FACTOR = 2.000
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 NUMBER RUNOFF (CFS) Tc (MIN.) INTENSITY (INCH/HOUR) AREA (ACRE)
1 38.89 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 NUMBER RUNOFF (CFS) Tc (MIN.) INTENSITY (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

 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
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

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

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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<<<
>>> TRAVEL TIME 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
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 1933.00 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 1932.00 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
TRAVEL TIME 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

PIECEWISE 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
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
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 <<<<<

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 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 <<<<<

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 NUMBER RUNOFF (CFS) Tc (MIN.) INTENSITY (INCH/HOUR) AREA (ACRES)
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 NUMBER RUNOFF (CFS) Tc (MIN.) INTENSITY (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.

** 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 =  11

>>> CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<

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 PIPE SIZE (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 <<<<<
>>>>> TRAVEL TIME 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 1920.00 = 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

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

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

FLOW LENGTH (FEET) = 215.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
DEPT 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

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*
UPSTREAM ELEVATION (FEET) = 1193.00
DOWNSTREAM ELEVATION (FEET) = 1189.00
ELEVATION DIFFERENCE (FEET) = 4.00
SUBAREA OVERLAND TIME OF FLOW (MIN.) = 5.65
100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 8.52
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<<<<<

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) = 5.68

**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<<<<

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20.94</td>
<td>9.70</td>
<td>6.014</td>
</tr>
<tr>
<td>2</td>
<td>21.33</td>
<td>10.61</td>
<td>5.677</td>
</tr>
</tbody>
</table>

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

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 18.00
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

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

*RUSER 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
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/HOUR) = 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.
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 NUMBER (CFS) Tc INTENSITY AREA
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 NUMBER (CFS) Tc INTENSITY AREA
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 NUMBER (CFS) Tc INTENSITY
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 1911.00 TO NODE 1911.00 IS CODE = 31

FLOW PROCESS FROM NODE 1912.00 TO NODE 1911.00 IS CODE = 31

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
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

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.) = 5.59
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

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 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

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
** CONFLUENCE DATA **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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### RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

** CONFLUENCE FORMULA USED FOR 2 STREAMS. **

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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** 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 **

** 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

** 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
- PEAK FLOW RATE (CFS) AT CONFLUENCE = 85.68

** FLOW PROCESS FROM NODE 1910.00 TO NODE 1909.00 IS CODE = 21 **

** DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE **

TOTAL NUMBER OF STREAMS = 2

- CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
  - TIME OF CONCENTRATION (MIN.) = 10.49
  - RAINFALL INTENSITY (INCH/HR) = 5.72
  - 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
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
TRADE TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.32
TRADE TIME THRU SUBAREA BASED ON VELOCITY(Feet/SEC.) = 3.69
AVERAGE FLOW DEPTH(Feet) = 0.96  TRADE 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
Page 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       88.25     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
-----------------------------------------------------------------------------------------------------------------------------
FLOW PROCESS FROM NODE 1906.00 TO NODE 1906.00 IS CODE = 11
-----------------------------------------------------------------------------------------------------------------------------

** 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
-----------------------------------------------------------------------------------------------------------------------------
FLOW PROCESS FROM NODE 1906.00 TO NODE 1907.00 IS CODE = 7

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

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

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 = 0.3200
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) = 95.00  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 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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Analysis prepared by:

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

******************************************************************************
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*

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<<<

ELEVATION DATA: UPSTREAM(Feet) = 1088.00 DOWNSTREAM(Feet) = 1082.00
CHANNEL LENGTH THRU SUBAREA(Feet) = 600.00 CHANNEL SLOPE = 0.0100
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<<<

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(FT) = 0.24
HALFSTREET FLOOD WIDTH(FEET) = 5.92
AVERAGE FLOW VELOCITY(FT/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(FT) = 0.28 HALFSTREET FLOOD WIDTH(FEET) = 7.51
FLOW VELOCITY(FT/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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26.18</td>
<td>5.43</td>
<td>8.740</td>
</tr>
<tr>
<td>2</td>
<td>37.96</td>
<td>9.17</td>
<td>6.236</td>
</tr>
</tbody>
</table>

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

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

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37.96</td>
<td>9.35</td>
<td>6.159</td>
<td>7.50</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2009.00 TO NODE 2005.00 = 870.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.91</td>
<td>5.99</td>
<td>8.212</td>
<td>0.84</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2014.00 TO NODE 2005.00 = 950.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30.21</td>
<td>5.99</td>
<td>8.212</td>
</tr>
</tbody>
</table>
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

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

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

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 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

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 OFPIPES = 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 = 81

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

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 OFPIPES = 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

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 OFPIPES = 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

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 <<<

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 OFPIPES = 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/HOUR) = 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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35.75
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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES:</th>
<th>MANNING WIDTH CROSSFALL</th>
<th>IN-/OUT-/PARK- HEIGHT</th>
<th>WIDTH LIP</th>
<th>HIKE FACTOR</th>
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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<<<

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

Page 2
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.
****************************************************************************
**ADDITION OF SUBAREA TO MAINLINE PEAK FLOW**
****************************************************************************
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.10
*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
****************************************************************************
**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
Page 4
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 <<
>> TRAVEL TIME 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**

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<th>INTENSITY (INCH/HOUR)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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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 18.00
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

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
P-21d.txt

>>>>> 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) <<<<<

Page 10
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) = 9.22
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 **

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.73</td>
<td>4.59</td>
<td>9.222</td>
<td>0.69</td>
</tr>
<tr>
<td>2</td>
<td>12.73</td>
<td>3.58</td>
<td>9.222</td>
<td>2.80</td>
</tr>
</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17.20</td>
<td>3.58</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>18.46</td>
<td>4.59</td>
<td>9.222</td>
</tr>
</tbody>
</table>

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 <<<

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
**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

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF(CFS)</th>
<th>Tc(MIN.)</th>
<th>INTENSITY(INCH/HR)</th>
<th>AREA(ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.46</td>
<td>4.68</td>
<td>9.222</td>
<td>3.49</td>
</tr>
<tr>
<td>2</td>
<td>3.90</td>
<td>3.59</td>
<td>9.222</td>
<td>0.47</td>
</tr>
</tbody>
</table>

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 = 0.8100
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

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.

*******************************************************************************

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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
       (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
       (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 = 0.8100
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31.93</td>
<td>6.20</td>
<td>8.024</td>
<td>5.13</td>
</tr>
<tr>
<td>2</td>
<td>16.27</td>
<td>4.89</td>
<td>9.222</td>
<td>1.96</td>
</tr>
<tr>
<td>3</td>
<td>15.37</td>
<td>5.82</td>
<td>8.362</td>
<td>2.27</td>
</tr>
</tbody>
</table>
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56.96</td>
<td>4.89</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>60.76</td>
<td>5.82</td>
<td>8.362</td>
</tr>
<tr>
<td>3</td>
<td>60.84</td>
<td>6.20</td>
<td>8.024</td>
</tr>
</tbody>
</table>

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
>>> TRAVEL TIME 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

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Tc(MIN.) = 6.60
SUBARE AEA(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

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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 = 0.9000
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 <<<

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**

**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.

**CONFLUENCE DATA**
STREAM  RUNOFF  Tc  INTENSITY  AREA

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
</tr>
<tr>
<td>1</td>
<td>14.80</td>
<td>3.96</td>
<td>9.222</td>
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<tr>
<td>2</td>
<td>16.02</td>
<td>4.76</td>
<td>9.222</td>
</tr>
</tbody>
</table>

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

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 2107.50 IS CODE = 52

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 2136.00 IS CODE = 7

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 2107.50 IS CODE = 52

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 2107.50 IS CODE = 52
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

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

*RUSER 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

*USER SPECIFIED(SUBAREA):

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 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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<tbody>
<tr>
<td>1</td>
<td>2.40</td>
<td>7.31</td>
<td>7.220</td>
<td>1.93</td>
</tr>
<tr>
<td>2</td>
<td>0.88</td>
<td>8.93</td>
<td>6.345</td>
<td>0.54</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.12</td>
<td>7.31</td>
<td>7.220</td>
</tr>
<tr>
<td>2</td>
<td>2.99</td>
<td>8.93</td>
<td>6.345</td>
</tr>
</tbody>
</table>

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

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

*RATIONAL METHOD INITIAL SUBAREA ANALYSIS*

*USER SPECIFIED (SUBAREA):*
USER-SPECIFIED RUNOFF COEFFICIENT = 0.2500
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
\[ T_{c} (\text{MIN.}) = 9.00 \]

**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.**

\[ T_{c} (\text{MIN.}) = 9.09 \]

**FLOW PROCESS FROM NODE 2111.00 TO NODE 2110.00 IS CODE = 31**

\[ T_{c} (\text{MIN.}) = 9.09 \]

**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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.70</td>
<td>10.10</td>
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<td>3.04</td>
</tr>
<tr>
<td>2</td>
<td>4.59</td>
<td>9.09</td>
<td>6.273</td>
<td>2.91</td>
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</tbody>
</table>

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

**PEAK FLOW RATE TABLE**

\[ \text{Page 33} \]
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

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

** MAIN STREAM CONFLUENCE DATA **
STREAM    RUNOFF       Tc      INTENSITY
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
1       8.98       11.22        5.476
LONGEST FLOWPATH FROM NODE 2116.00 TO NODE 2106.50 = 1770.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **
STREAM    RUNOFF       Tc      INTENSITY
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
1        3.12        7.67        6.999
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

FLOW PROCESS FROM NODE 2106.50 TO NODE 2104.00 IS CODE = 31

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

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

*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 <<<

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 <<<

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 <<<

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 <<<

Page 38
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 **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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<th>INTENSITY (INCH/HOUR)</th>
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<td>5.403</td>
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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 **

<table>
<thead>
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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
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<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
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LONGEST FLOWPATH FROM NODE 2116.00 TO NODE 2118.40 = 2172.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

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LONGEST FLOWPATH FROM NODE 2134.00 TO NODE 2118.40 = 2528.00 FEET.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</thead>
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<td>31.59</td>
<td>11.62</td>
<td>5.352</td>
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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 PIPE SIZE (NON-PRESSURE FLOW) <<<<

ELEVATION DATA: UPSTREAM (FEET) = 989.00  DOWNSTREAM (FEET) = 984.00
FLOW LENGTH (FEET) = 50.00  MANNING'S N = 0.013
DEPT 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

TRAPEZOIDAL CHANNEL FLOW

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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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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
** MAIN STREAM CONFLUENCE DATA **

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LONGEST FLOWPATH FROM NODE 2134.00 TO NODE 2101.00 = 2628.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

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<th>STREAM NUMBER</th>
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LONGEST FLOWPATH FROM NODE 2145.00 TO NODE 2101.00 = 2470.00 FEET.

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>1</td>
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<td>2</td>
<td>40.64</td>
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</table>

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 = 11 **

** FLOW PROCESS FROM NODE 2101.00 TO NODE 2101.00 IS CODE = 12 **

** 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
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.
APPENDIX A

AES
Rational Method Hydrology

Proposed Condition

BASIN B
<table>
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<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
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<td>Elev 2 (feet)</td>
<td>Length (feet)</td>
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</table>

Newland Sierra
Run Name: P-22d.DAT
Page 2 of
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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>WIDTH (FT)</th>
<th>CROSSFALL</th>
<th>IN-/OUT-/PARK-</th>
<th>HEIGHT (FT)</th>
<th>LIP (FT)</th>
<th>HIKE (FT)</th>
<th>FACTOR</th>
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<td>1.50</td>
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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 HALF STREET 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 295.00 TO NODE 294.00 IS CODE = 21

>>> 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/HOUR) = 9.22
TOTAL STREAM AREA(ACRES) = 0.65
PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.39

** CONFLUENCE DATA **

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

** PEAK FLOW RATE TABLE **

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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

Page 7
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

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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 <<<<<

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

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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

----------------------------------------------------------------
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

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31.62</td>
<td>3.60</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>32.21</td>
<td>5.48</td>
<td>8.688</td>
</tr>
</tbody>
</table>

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(FT) = 0.31    HALFSTREET FLOOD WIDTH(FT) =  8.99
FLOW VELOCITY(FT/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

ELEVATION DATA: UPSTREAM(FT) = 851.50    DOWNSTREAM(FT) = 851.00
FLOW LENGTH(FT) = 25.00   MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.2 INCHES
PIPE-FLOW VELOCITY(FT/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

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
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 = 0.9000  
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

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FLOW LENGTH (FEET) = 38.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.00
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

************************************************************
FLOWS 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 275.00 TO NODE 275.00 IS CODE = 1

<<<<<<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 275.00 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) = 9.22

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.

END OF SUBAREA STREET FLOW HYDRAULICS:

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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<td>43.17</td>
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<td>7.648</td>
<td>5.46</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tr>
<td>1</td>
<td>39.87</td>
<td>3.94</td>
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<tr>
<td>2</td>
<td>46.55</td>
<td>6.68</td>
<td>7.648</td>
</tr>
</tbody>
</table>

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

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

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

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

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

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!
P-22d.TXT

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
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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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
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Node to Node BANK
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

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

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 = 0.1934 (PER LACFCD/RCFC&WCW HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 8.20
FLOW VELOCITY(Feet/Sec) = 4.96 (PER LACFCD/RCFC&WCW 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 = 0.4400
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

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
<table>
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<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
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</table>

Node to Node BANK 1 2 3
Analysis prepared by:

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

FILE NAME: P-22-2.DAT

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*

<table>
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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN-/OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR</th>
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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
P-22-2.TXT

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 2220.00 TO NODE 22.20 IS CODE = 31

>>>>>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
| Node to Node | Code 1 | Elev 1 (feet) | Elev 2 (feet) | Length (feet) | C Factor | Area (ac.) | Comments | BANK |
|--------------|-------|--------------|--------------|--------------|----------|-----------|----------|
| 2232-2231    | 2     | 1240         | 1195         | 100          | 0.35     | 0.26      |          |      |
| 2231-2230    | 5     | 1195         | 930          | 490          |          | 0.45      | 4.32     |      |
| 2231-2230    | 8     |              |              |              |          | 0.45      | 4.32     |      |
| 2230-22.3    | 3     | 930          | 882          | 180          | 4.58     | 4.58      |          |      |
**DESCRIPTION OF STUDY**

* NEWLAND SIERRA - PROPOSED HYDROLOGY

* SUB-BASIN 22.3

* USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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**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

**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 <<<<

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 18.00
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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<th>Node to Node</th>
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<th>Elev 2 (feet)</th>
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NEWLAND SIERRA - PROPOSED HYDROLOGY
SUB-BASIN 22.4

FILE NAME: P-22-4.DAT

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*

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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 <<<<<

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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<th>Code 1</th>
<th>Code 2</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
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**28.07**
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

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*

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<th>NO.</th>
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<th>(FT)</th>
<th>SIDE / SIDE/ WAY</th>
<th>(FT)</th>
<th>(FT)</th>
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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 LACFCDF/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 2.90
FLOW VELOCITY(FEET/SEC) = 3.66 (PER LACFCDF/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 PIPE SIZE (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 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   HALFWAY STREET FLOOD WIDTH(FEET) = 15.21
FLOW VELOCITY(FT/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 = 0.9000
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FT) = 85.00
UPSTREAM ELEVATION(FT) = 814.70
DOWNSTREAM ELEVATION(FT) = 814.00
ELEVATION DIFFERENCE(FT) = 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 = 0.900
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.

**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 **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>1</td>
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<tr>
<td>2</td>
<td>20.74</td>
<td>8.44</td>
<td>6.580</td>
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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
TRAVEL TIME 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 23.00 IS CODE = 31

>>> 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

Page 9
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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</table>

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

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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*

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 18.00
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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<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
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7.20
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 23.2                                                        *
**************************************************************************

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*

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<tr>
<th>NO.</th>
<th>CROWN TO STREET-CROSSFALL:</th>
<th>CURB GUTTER-GEOMETRIES:</th>
<th>MANNING WIDTH CROSSFALL</th>
<th>IN-/OUT-/PARK-</th>
<th>HEIGHT WIDTH</th>
<th>LIP HIKE FACTOR</th>
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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 <<<

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
END OF RATIONAL METHOD ANALYSIS
<table>
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
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Analysis prepared by:

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

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*

<table>
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<tr>
<th>NO.</th>
<th>HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN-/ OUT- /PARK- HEIGHT WIDTH LIP HIKE FACTOR</th>
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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 <<<

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(NEET) = 823.00 DOWNSTREAM(FEET) = 798.00
FLOW LENGTH(FT) = 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

Page 3
END OF RATIONAL METHOD ANALYSIS

▲
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code 1</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
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</table>
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 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*

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<th>NO.</th>
<th>HALF- CROWN TO STREET- CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING</th>
<th></th>
<th>WIDTH CROSSFALL IN- / OUT-/PARK-</th>
<th>HEIGHT WIDTH LIP HIKE FACTOR</th>
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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

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 = 0.1247 (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 = 0.4200
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 18.00
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 2340.00 = 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 <<<

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) = 21.0 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 LACFC/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 **

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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<td>4.684</td>
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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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Analysis prepared by:

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

FILE NAME: P-24D.DAT

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*

<table>
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<th>NO.</th>
<th>HALF-CROWN (FT)</th>
<th>STREET-CROSSFALL (FT)</th>
<th>CURB GUTTER-GEOMETRIES: MANNING WIDTH (FT)</th>
<th>CROSSFALL IN-/OUT-/PARK- HEIGHT (FT)</th>
<th>WAY WIDTH (FT)</th>
<th>LIP (FT)</th>
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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

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

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

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 <<<<<

Page 3
USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.9000
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 = 0.9000
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  HALFWIDTH(FEET) = 14.66  
FLOW VELOCITY(FT/SEC.) = 2.80  DEPTH*VELOCITY(FT²/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(FT/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

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

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 18.00
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 PIPE = 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 = 0.4600
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

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

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

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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.

COMPUTE NATURAL VALLEY CHANNEL FLOW
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.

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

ADDITION OF SUBAREA TO MAINLINE PEAK FLOW
FLOW PROCESS FROM NODE 246.00 TO NODE 245.00 IS CODE = 31

COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
FLOW PROCESS FROM NODE 246.00 TO NODE 245.00 IS CODE = 31

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

Page 11
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 OFPIPES = 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
        (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
        (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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Analysis prepared by:

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

FILE NAME: P-24-2.DAT

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*

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 <<<

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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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

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*

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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
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>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
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 OFPIPES = 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

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

*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
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.

**END OF SUBAREA STREET FLOW HYDRAULICS**
FLOW PROCESS FROM NODE 1365.00 TO NODE 1364.00 IS CODE = 31

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 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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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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 18.00
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
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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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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

RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
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

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
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 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<<<<

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<<<<

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 **
<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
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</thead>
<tbody>
<tr>
<td>NUMBER</td>
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<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
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<td>10.81</td>
<td>5.609</td>
<td>8.80</td>
</tr>
<tr>
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<td>3.82</td>
<td>8.81</td>
<td>6.400</td>
<td>1.15</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
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<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
</tr>
<tr>
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<td>8.81</td>
<td>6.400</td>
</tr>
<tr>
<td>2</td>
<td>29.54</td>
<td>10.81</td>
<td>5.609</td>
</tr>
</tbody>
</table>

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  HALFWAY 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 **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
<tr>
<td>1</td>
<td>29.54</td>
<td>12.85</td>
<td>5.015</td>
<td>9.95</td>
</tr>
<tr>
<td>2</td>
<td>1.81</td>
<td>9.05</td>
<td>6.291</td>
<td>0.56</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25.36</td>
<td>9.05</td>
<td>6.291</td>
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<tr>
<td>2</td>
<td>30.98</td>
<td>12.85</td>
<td>5.015</td>
</tr>
</tbody>
</table>

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

THE LONGEST FLOW PATH FROM NODE 2296.00 TO NODE 2296.00 IS CODE = 1

ELEVATION DATA: UPSTREAM (FEET) = 1260.00  DOWNSTREAM (FEET) = 1258.00
FLOW LENGTH (FEET) = 75.00  MANNING'S N = 0.013
DEPT 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 FLOW PATH FROM NODE 1372.00 TO NODE 2296.00 = 2410.00 FEET.

FLOW PROCESS FROM NODE 2295.00 TO NODE 2294.00 IS CODE = 21

*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( FeETs) = 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

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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 OFPIPES = 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 294.00 TO NODE 297.00 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 <<<
> TRAVEL TIME 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 = 0.5700
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 <<<

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tbody>
<tr>
<td>1</td>
<td>6.53</td>
<td>8.29</td>
<td>6.655</td>
<td>1.66</td>
</tr>
<tr>
<td>2</td>
<td>1.64</td>
<td>7.30</td>
<td>7.224</td>
<td>0.44</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.39</td>
<td>7.30</td>
<td>7.224</td>
</tr>
<tr>
<td>2</td>
<td>8.04</td>
<td>8.29</td>
<td>6.655</td>
</tr>
</tbody>
</table>

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 2495.00 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) = 1265.00
FLOW LENGTH (FEET) = 535.00  MANNING'S N = 0.013

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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
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

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

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 18.00
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 <<<<<<
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

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 OFPIPES = 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
  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 <<<

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  HALF STREET 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)
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       | 12.01  | 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

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

** MAIN STREAM CONFLUENCE DATA **
STREAM | RUNOFF | Tc | INTENSITY | AREA
NUMBER  | (CFS)  | (MIN.) | (INCH/HOUR) | (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 | RUNOFF | Tc | INTENSITY | AREA
NUMBER  | (CFS)  | (MIN.) | (INCH/HOUR) | (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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36.60</td>
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<td>5.988</td>
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<td>2</td>
<td>42.79</td>
<td>13.12</td>
<td>4.951</td>
</tr>
</tbody>
</table>

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

DETAILED DESIGN

TRAVE TIME 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 FLOW PATH 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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42.79</td>
<td>13.60</td>
<td>4.836</td>
<td>14.59</td>
</tr>
<tr>
<td>2</td>
<td>6.84</td>
<td>9.48</td>
<td>6.104</td>
<td>4.48</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36.65</td>
<td>9.48</td>
<td>6.104</td>
</tr>
<tr>
<td>2</td>
<td>48.21</td>
<td>13.60</td>
<td>4.836</td>
</tr>
</tbody>
</table>

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
----------------------------------------------------------------------------
USE 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
----------------------------------------------------------------------------
USE COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)
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 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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48.21</td>
<td>13.76</td>
<td>4.801</td>
<td>19.07</td>
</tr>
<tr>
<td>2</td>
<td>55.70</td>
<td>15.35</td>
<td>4.473</td>
<td>21.00</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98.12</td>
<td>13.76</td>
<td>4.801</td>
</tr>
<tr>
<td>2</td>
<td>100.62</td>
<td>15.35</td>
<td>4.473</td>
</tr>
</tbody>
</table>

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.

*****************************************************************************

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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

FLOW PROCESS FROM NODE 2231.00 TO NODE 2230.00 IS CODE = 21

FLOW PROCESS FROM NODE 2230.00 TO NODE 2229.00 IS CODE = 62
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 PIPE SIZE (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

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

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.) = 1.80
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 CONFLUED 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
Page 40
** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.85</td>
<td>8.27</td>
<td>6.663</td>
<td>2.97</td>
</tr>
<tr>
<td>2</td>
<td>5.38</td>
<td>4.61</td>
<td>9.222</td>
<td>0.97</td>
</tr>
<tr>
<td>3</td>
<td>3.71</td>
<td>6.07</td>
<td>8.138</td>
<td>0.80</td>
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</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14.80</td>
<td>4.61</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>17.14</td>
<td>6.07</td>
<td>8.138</td>
</tr>
<tr>
<td>3</td>
<td>18.77</td>
<td>8.27</td>
<td>6.663</td>
</tr>
</tbody>
</table>

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 OFPIPES = 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

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1             44.38        6.92        7.481           16.95 |

LONGEST FLOWPATH FROM NODE 2211.00 TO NODE 2219.00 = 870.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 <<<

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

** 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<<<<
>>>>>TRAVEL TIME 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, 10.0%, 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:

TRAVEL TIME 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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>181.60</td>
<td>16.65</td>
<td>4.244</td>
<td>98.48</td>
</tr>
<tr>
<td>2</td>
<td>10.90</td>
<td>8.87</td>
<td>6.369</td>
<td>6.59</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>107.67</td>
<td>8.87</td>
<td>6.369</td>
</tr>
<tr>
<td>2</td>
<td>188.87</td>
<td>16.65</td>
<td>4.244</td>
</tr>
</tbody>
</table>

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

>>IMAGE COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>IMAGE 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

>>IMAGE 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

>>IMAGE 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

ействие трапециoidalного потока в канале:

Максимальная глубина (футы) = 10.00
100-летний интенсивность дождя (дюймов/час) = 6.836

*Пользовательском заданный (субареа):
Пользовательский заданный коэффициент инфильтрации = 0.350
S.C.S. КУРВОМЕТР (AMC II) = 0

Средняя скорость (фут/сек) = 10.52
Средний расход (секунд) = 1.69

Субареа скорость (фут/сек) = 7.95
Субареа площадь (акр) = 5.54
Субареа инфильтрация (секунд) = 13.25

средний коэффициент инфильтрации = 0.350

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FOOT) = 0.31 FLOW VELOCITY(FOOT/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

ействие трапециoidalного потока в канале:

Субареа площадь (акр) = 5.54
Субареа инфильтрация (секунд) = 13.25

средний коэффициент инфильтрации = 0.350

Area-Average Runoff Coefficient = 0.350

TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 14.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FOOT) = 0.31 FLOW VELOCITY(FOOT/SEC.) = 12.84
LONGEST FLOWPATH FROM NODE 2207.00 TO NODE 2205.00 = 1165.00 FEET.

FLOW PROCESS FROM NODE 2208.00 TO NODE 2208.00 IS CODE = 1

ействие трапециoidalного потока в канале:

Субареа площадь (акр) = 5.54
Субареа инфильтрация (секунд) = 13.25

средний коэффициент инфильтрации = 0.350

Area-Average Runoff Coefficient = 0.350

TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 14.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FOOT) = 0.31 FLOW VELOCITY(FOOT/SEC.) = 12.84
LONGEST FLOWPATH FROM NODE 2207.00 TO NODE 2205.00 = 1165.00 FEET.
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>188.87</td>
<td>16.70</td>
<td>4.236</td>
<td>105.07</td>
</tr>
<tr>
<td>2</td>
<td>14.31</td>
<td>7.99</td>
<td>6.816</td>
<td>5.98</td>
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</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>131.69</td>
<td>7.99</td>
<td>6.816</td>
</tr>
<tr>
<td>2</td>
<td>197.76</td>
<td>16.70</td>
<td>4.236</td>
</tr>
</tbody>
</table>

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<<

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
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

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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 = 2.00
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 = 2.00
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     291.72  8.77       6.419     73.89
2     291.72  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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20.95
Analysis prepared by:

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

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*

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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL</th>
<th>IN-/OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR</th>
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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

UPSTREAM ELEVATION(Feet) = 1292.00  DOWNSTReem 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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning’s FRICITION 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 HALF STREET 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<<<<

UPSTREAM ELEVATION (FEET) = 1286.00 DOWNSTREAM ELEVATION (FEET) = 1285.00
STREET LENGTH (FEET) = 145.00 CURB HEIGHT (INCHES) = 6.0
STREET HALF WIDTH (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
HALF STREET 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  HALF STREET 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

*********************************************************
P-25-2.TXT
FLOW PROCESS FROM NODE  2275.00 TO NODE  2274.00 IS CODE =  62

-----------------------------------------------------------------------------

>>>>(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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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

----------------------------------------------------------------------------

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

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 18.00
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.5 INCHES

Page 8
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.63
ESTIMATED PIPE DIAMETER(INCH) = 18.00  NUMBER OFPIPES = 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 **

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

FLOW PROCESS FROM NODE 2271.20 TO NODE 2271.30 IS CODE = 21

FLOW PROCESS FROM NODE 2271.30 TO NODE 2271.40 IS CODE = 62

**FLOW PROCESS FROM NODE 2271.00 TO NODE 2271.00 IS CODE = 1**

**FLOW PROCESS FROM NODE 2271.20 TO NODE 2271.30 IS CODE = 21**

**FLOW PROCESS FROM NODE 2271.30 TO NODE 2271.40 IS CODE = 62**
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

>>IMAGE.COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>IMAGE. 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 18.00
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

>>IMAGE.DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<<

Page 11
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  |
---      | ------- | ---- | --------- | ----- |
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  |
---      | ------- | ---- | --------- |
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 = .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

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

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.95</td>
<td>8.70</td>
<td>6.453</td>
</tr>
<tr>
<td>2</td>
<td>10.10</td>
<td>12.17</td>
<td>5.196</td>
</tr>
</tbody>
</table>

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
---------------------------------------------------------------

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
---------------------------------------------------------------

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
---------------------------------------------------------------

*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) = 7.115
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.10</td>
<td>13.00</td>
<td>4.979</td>
<td>3.12</td>
</tr>
<tr>
<td>2</td>
<td>2.23</td>
<td>8.32</td>
<td>6.640</td>
<td>0.66</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.81</td>
<td>8.32</td>
<td>6.640</td>
</tr>
<tr>
<td>2</td>
<td>11.78</td>
<td>13.00</td>
<td>4.979</td>
</tr>
</tbody>
</table>

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<<<
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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.78</td>
<td>13.08</td>
<td>4.959</td>
<td>3.78</td>
</tr>
<tr>
<td>2</td>
<td>10.55</td>
<td>8.42</td>
<td>6.589</td>
<td>2.81</td>
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</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.42</td>
<td>8.42</td>
<td>6.589</td>
</tr>
</tbody>
</table>
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

FLOW PROCESS FROM NODE 2268.80 TO NODE 2268.80 IS CODE = 1

FLOW PROCESS FROM NODE 2270.00 TO NODE 2269.00 IS CODE = 21

*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
P-25-2.TXT

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 18.00
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

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

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.
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
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
DEPARTMENT OF FLOW IN 18.0 INCH PIPE IS 4.3 INCHES
PIPE-FLOW VELOCITY(Feet/SEC) = 4.74
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.00
NUMBER OF PIPES = 1
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.3 INCHES
PIPE-FLOW VELOCITY(Feet/SEC) = 4.74

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

FLOW PROCESS FROM NODE 2271.00 TO NODE 2271.00 IS CODE = 11

** 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

>>>>(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^2/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
PRODUCT OF DEPTH & VELOCITY (FT^2/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**

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(FT) = 0.32 HALFWAY FLOOD WIDTH(FT) = 9.70
FLOW VELOCITY(FT/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<<<<<
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.) = 7.4
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

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

DECLINE 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 <<<

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 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

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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

Page 38
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
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<tr>
<td>3</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

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<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
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<td>14.45</td>
<td>4.651</td>
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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

MAINTAIN 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

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
P-25-2.TXT

>>>>>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

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<<<<
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 = 0.5700  
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tr>
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<td>2</td>
<td>5.46</td>
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<td>7.875</td>
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</table>

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 18.00
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 **

<table>
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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
<tbody>
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</table>

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<<<<<
>>>>>TRAVEL TIME 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 LACFCDF/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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
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<td>Area (ac.)</td>
<td>Comments</td>
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| Node to Node | Code | Elev 1 (feet) | Elev 2 (feet) | Length (feet) | C Factor | Area (ac.) | Comments | BANK  
|--------------|------|---------------|---------------|--------------|----------|------------|----------|-------
| 25.2  25.1 | 5  8 | 1150  935      | 935  590      | 0.38  9.55   |          |            |          |       
| 25.1  25   | 5  8 | 935  795      | 795  2310     | 0.36  30.51  |          |            |          |       
| 25   25   | 1   |               |               |              |          |            | 2 OF 2   |       
| 25   24.9 | 5  8 | 795  763      | 763  1270     | 0.41  15.21  |          |            | VALLEY   |       
| 25   24.9 | 8   |               |               |              |          |            |          | 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:

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*

<table>
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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/OUT-/PARK-</th>
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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 FRICITION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning’s FRICITION 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(FT)  =  0.39
HALFSTREET FLOOD WIDTH(FT) =  13.22
AVERAGE FLOW VELOCITY(FT/SEC.) =    2.64
PRODUCT OF DEPTH&VELOCITY(FT²/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

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 = 0.510
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
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.

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
P-25d.TXT

>>>>> 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.) = 7.24
100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 7.26
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 OFPIPES = 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 = 0.5100
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

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning's FRICITION 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  \( T_c \) (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

** CONFLUENCE DATA **

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<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>4.849</td>
</tr>
</tbody>
</table>
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

FLOW PROCESS FROM NODE 2580.00 TO NODE 2579.00 IS CODE = 21

FLOW PROCESS FROM NODE 2579.00 TO NODE 2578.00 IS CODE = 62
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

==============================
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

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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 HALFWESTREETS 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 18.00
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

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TOTAL STREAM AREA (ACRES) = 1.11
PEAK FLOW RATE (CFS) AT CONFLUENCE = 3.42

** CONFLUENCE DATA **
STREAM NUMBER   RUNOFF (CFS)   Tc (MIN.)   INTENSITY (INCH/HOUR)   AREA (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 NUMBER   RUNOFF (CFS)   Tc (MIN.)   INTENSITY (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 <<<<

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

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

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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.36</td>
<td>12.19</td>
<td>5.189</td>
<td>4.12</td>
</tr>
<tr>
<td>2</td>
<td>7.48</td>
<td>8.99</td>
<td>6.316</td>
<td>2.32</td>
</tr>
</tbody>
</table>

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

---

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** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.82</td>
<td>8.99</td>
<td>6.316</td>
</tr>
<tr>
<td>2</td>
<td>17.51</td>
<td>12.19</td>
<td>5.189</td>
</tr>
</tbody>
</table>

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

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

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

*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
P-25d.TXT

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(FT/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(ACRE) = 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(ACRE) = 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

============================================================================

** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 20.85 12.69 5.057 7.70

** 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

** 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<<<<<
UPSTREAM ELEVATION(FT) = 1269.00 DOWNSTREAM ELEVATION(FT) = 1257.00
STREET LENGTH(FT) = 460.00 CURB HEIGHT(INCHES) = 6.0
STREET HALF WIDTH(FT) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FT) = 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(FT) = 0.32
HALFSTREET FLOOD WIDTH(FT) = 9.57
AVERAGE FLOW VELOCITY(FT/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(FT) = 0.38 HALFSTREET FLOOD WIDTH(FT) = 12.59
FLOW VELOCITY(FT/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

FLOW LENGTH(FT) = 10.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.00
DEPTH OF FLOW IN 18.0 INCH PIPE IS 9.0 INCHES
PIPE-FLOW VELOCITY(FT/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 NUMBER RUNOFF (CFS) Tc (MIN.) INTENSITY (INCH/HOUR) AREA (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 NUMBER RUNOFF (CFS) Tc (MIN.) INTENSITY (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

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

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 <<<<<

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning's FRICITION 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

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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

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

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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.

TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
TIME OF CONCENTRATION(MIN.) = 10.11
RAINFALL INTENSITY(INCH/HOUR) = 5.86
TOTAL STREAM AREA(ACRES) = 3.34
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.01

** CONFLUENCE DATA **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<td>6.071</td>
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<td>10.01</td>
<td>10.11</td>
<td>5.855</td>
<td>3.34</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</thead>
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</tr>
<tr>
<td>3</td>
<td>18.14</td>
<td>10.11</td>
<td>5.855</td>
</tr>
</tbody>
</table>

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

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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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<td>2</td>
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Rainfall Intensity and Time of Concentration Ratio

Confluence Formula Used for 2 Streams.

** Peak Flow Rate Table **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>2</td>
<td>66.43</td>
<td>14.15</td>
<td>4.714</td>
</tr>
</tbody>
</table>

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^2/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(FT/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(FT) = 310.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.00
DEPHT OF FLOW IN 18.0 INCH PIPE IS 7.3 INCHES
PIPE-FLOW VELOCITY(FT/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

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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF(CFS)</th>
<th>Tc(MIN.)</th>
<th>INTENSITY(INCH/HOUR)</th>
<th>AREA(ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF(CFS)</th>
<th>Tc(MIN.)</th>
<th>INTENSITY(INCH/HOUR)</th>
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<tr>
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<td>9.222</td>
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</table>

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 18.00

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 <<

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tr>
<td>1</td>
<td>9.68</td>
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<td>11.60</td>
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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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRES)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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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
P-25d.TXT

>>> 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(FT) = 0.36  HALF STREET FLOOD WIDTH(FT) = 11.53
FLOW VELOCITY(FT/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(FT) = 1248.00  DOWNSTREAM(FT) = 1247.20
FLOW LENGTH(FT) = 515.00  MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.2 INCHES
PIPE-FLOW VELOCITY(FT/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(FT) = 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

>>><><><><<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><<
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

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** Peak Flow Rate Table **

<table>
<thead>
<tr>
<th>Stream</th>
<th>Runoff (CFS)</th>
<th>Tc (MIN.)</th>
<th>Intensity (INCH/HOUR)</th>
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Computed Confluence Estimates are as follows:

Peak Flow Rate (CFS) = 83.97
Tc (MIN.) = 14.19
Total Area (ACRES) = 32.4

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 2513.00 TO NODE 2512.00 IS CODE = 21

============================================================================

**RATIONAL METHOD INITIAL SUBAREA ANALYSIS**

*USER SPECIFIED(SUBAREA):*
USER-SPECIFIED RUNOFF COEFFICIENT = 0.8800
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 = 0.8800
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  HALFWIDTH (FEET) = 8.84
FLOW VELOCITY (FEET/SEC.) = 7.00  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

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

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

*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

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
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 **

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<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
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** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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**PEAK FLOW RATE**

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<th>PEAK FLOW RATE (CFS)</th>
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<td>15.02</td>
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</table>

**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**

**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 OFPIPES = 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.

**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

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

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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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>92.04</td>
<td>15.20</td>
<td>4.501</td>
<td>34.43</td>
</tr>
<tr>
<td>2</td>
<td>3.25</td>
<td>2.31</td>
<td>9.222</td>
<td>0.40</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48.17</td>
<td>2.31</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>93.62</td>
<td>15.20</td>
<td>4.501</td>
</tr>
</tbody>
</table>

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 <<<

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
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

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**PEAK FLOW RATE TABLE**

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48.96</td>
<td>2.23</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>95.29</td>
<td>15.29</td>
<td>4.484</td>
</tr>
</tbody>
</table>

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 = 0.8900
- 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

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

MAINTAINED 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 = 0.2500
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

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<<<
>>> TRAVEL TIME 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

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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) <<<

Page 65
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 = 0.2500
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 <<

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 PIPE SIZE (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)
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

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

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

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*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
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<<

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 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
** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.04</td>
<td>9.83</td>
<td>5.963</td>
<td>6.06</td>
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<tr>
<td>2</td>
<td>3.47</td>
<td>18.38</td>
<td>3.982</td>
<td>3.49</td>
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</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.90</td>
<td>9.83</td>
<td>5.963</td>
</tr>
<tr>
<td>2</td>
<td>8.84</td>
<td>18.38</td>
<td>3.982</td>
</tr>
</tbody>
</table>

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 <<<
>>> TRAVEL TIME 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44.98</td>
<td>8.67</td>
<td>6.467</td>
</tr>
<tr>
<td>2</td>
<td>45.85</td>
<td>11.25</td>
<td>5.465</td>
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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 <<<
>>> TRAVEL TIME 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 **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>61.46</td>
<td>12.88</td>
<td>5.010</td>
<td>45.97</td>
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</table>

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<<<
>>> TRAVEL TIME 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 CONFLUED 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

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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

FLOW PROCESS FROM NODE 2459.00 TO NODE 2461.00 IS CODE = 21

FLOW PROCESS FROM NODE 2461.00 TO NODE 2460.00 IS CODE = 51

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 2459.00 TO NODE 2461.00 IS CODE = 21

FLOW PROCESS FROM NODE 2461.00 TO NODE 2460.00 IS CODE = 51

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) <<<
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 = 0.25
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 = 0.5700
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

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.82</td>
<td>10.18</td>
<td>5.829</td>
</tr>
<tr>
<td>2</td>
<td>20.25</td>
<td>12.48</td>
<td>5.112</td>
</tr>
</tbody>
</table>

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

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

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20.25</td>
<td>13.12</td>
<td>4.949</td>
<td>11.38</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2465.00 TO NODE 2460.00 = 2460.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.01</td>
<td>10.11</td>
<td>5.855</td>
<td>5.47</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2468.00 TO NODE 2460.00 = 1365.00 FEET.
** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23.61</td>
<td>10.11</td>
<td>5.855</td>
</tr>
<tr>
<td>2</td>
<td>27.02</td>
<td>13.12</td>
<td>4.949</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 2460.00 TO NODE 2459.00 IS CODE = 31

FLOW PROCESS FROM NODE 2459.00 TO NODE 2459.00 IS CODE = 11

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.02</td>
<td>13.45</td>
<td>4.871</td>
<td>16.85</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2465.00 TO NODE 2459.00 = 2605.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22.16</td>
<td>16.22</td>
<td>4.317</td>
<td>83.59</td>
</tr>
</tbody>
</table>

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LONGEST FLOWPATH FROM NODE 2599.00 TO NODE 2459.00 = 5215.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45.40</td>
<td>13.45</td>
<td>4.871</td>
</tr>
<tr>
<td>2</td>
<td>46.11</td>
<td>16.22</td>
<td>4.317</td>
</tr>
</tbody>
</table>

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

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.

***********************************************************************
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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<<<<
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.52</td>
<td>8.65</td>
<td>6.477</td>
<td>2.21</td>
</tr>
<tr>
<td>2</td>
<td>19.61</td>
<td>7.15</td>
<td>7.319</td>
<td>4.70</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26.66</td>
<td>7.15</td>
<td>7.319</td>
</tr>
<tr>
<td>2</td>
<td>25.87</td>
<td>8.65</td>
<td>6.477</td>
</tr>
</tbody>
</table>

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

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RAINFALL INTENSITY(INCH/HR) = 6.33
TOTAL STREAM AREA(ACRES) = 10.91
PEAK FLOW RATE(CFS) AT CONFLUENCE = 18.41

** CONFLUENCE DATA **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>64.24</td>
<td>17.75</td>
<td>4.073</td>
<td>107.35</td>
</tr>
<tr>
<td>2</td>
<td>18.41</td>
<td>8.95</td>
<td>6.334</td>
<td>10.91</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50.82</td>
<td>8.95</td>
<td>6.334</td>
</tr>
<tr>
<td>2</td>
<td>76.09</td>
<td>17.75</td>
<td>4.073</td>
</tr>
</tbody>
</table>

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

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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 <<<<

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 PIPE SIZE (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 18.00
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.4 INCHES
PIPE-FLOW VELOCITY(FT/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) = 995.00 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
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) = 0.41FLOW 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

FLOW PROCESS FROM NODE 2442.00 TO NODE 2442.00 IS CODE = 1

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84.05</td>
<td>18.01</td>
<td>4.035</td>
<td>121.85</td>
</tr>
<tr>
<td>2</td>
<td>6.59</td>
<td>8.23</td>
<td>6.688</td>
<td>1.68</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44.99</td>
<td>8.23</td>
<td>6.688</td>
</tr>
<tr>
<td>2</td>
<td>88.02</td>
<td>18.01</td>
<td>4.035</td>
</tr>
</tbody>
</table>

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

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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  HALF STREET 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

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

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

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

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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 OFPIPES = 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.
>>> 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
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>>> 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, 10.0%, 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 <<<<<

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

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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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tbody>
<tr>
<td>1</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tbody>
<tr>
<td>1</td>
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<td>6.648</td>
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<tr>
<td>2</td>
<td>122.45</td>
<td>18.76</td>
<td>3.931</td>
</tr>
</tbody>
</table>
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 <<<<<<
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 OFPIPES = 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

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 2399.00 TO NODE 2398.00 IS CODE = 62

**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 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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning’s FRICITION 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 = 945.00 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!
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 <<<

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

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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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<td>5.75</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
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<td>8.425</td>
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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 18.00
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

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

*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

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning’s FRICITION 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.

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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 **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tr>
<td>1</td>
<td>9.10</td>
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<td>2.93</td>
<td>7.93</td>
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</table>

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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>1</td>
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<td>2</td>
<td>10.92</td>
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<td>6.851</td>
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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

ELEVATION DATA: UPSTREAM (FEET) = 894.00  DOWNSTREAM (FEET) = 888.00
FLOW LENGTH (FEET) = 105.00  MANNING'S N = 0.013
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

** MAIN STREAM CONFLUENCE DATA **

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<th>AREA (ACRE)</th>
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LONGEST FLOWPATH FROM NODE 2400.00 TO NODE 2414.00 = 1505.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

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<tr>
<th>STREAM NUMBER</th>
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<th>AREA (ACRE)</th>
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LONGEST FLOWPATH FROM NODE 2417.00 TO NODE 2414.00 = 550.00 FEET.
** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tr>
<td>2</td>
<td>16.86</td>
<td>8.85</td>
<td>6.381</td>
</tr>
</tbody>
</table>

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 <<<<<

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.98</td>
<td>7.61</td>
<td>7.035</td>
<td>4.12</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2400.00 TO NODE 2391.00 = 1825.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>122.45</td>
<td>19.13</td>
<td>3.881</td>
<td>151.39</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2599.00 TO NODE 2391.00 = 7275.00 FEET.
** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>65.67</td>
<td>7.61</td>
<td>7.035</td>
</tr>
<tr>
<td>2</td>
<td>131.82</td>
<td>19.13</td>
<td>3.881</td>
</tr>
</tbody>
</table>

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 OFPIPES = 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

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

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
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
P-25d.TXT

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

Page 119
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 <<<<

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

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

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

*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
P-25.d.TXT

DOWNSTREAM ELEVATION(FEET) =    895.00
ELEVATION DIFFERENCE( FEET) =      2.00
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

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.67</td>
<td>8.81</td>
<td>6.400</td>
<td>5.02</td>
</tr>
<tr>
<td>2</td>
<td>7.77</td>
<td>10.93</td>
<td>5.567</td>
<td>0.45</td>
</tr>
</tbody>
</table>

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

ELEVATION DATA: UPSTREAM (FEET) = 885.00 DOWNSTREAM (FEET) = 881.00
FLOWS 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

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.67</td>
<td>9.86</td>
<td>5.952</td>
<td>5.47</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2421.00 TO NODE 2422.00 = 1345.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
</table>

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LONGEST FLOWPATH FROM NODE 2425.00 TO NODE 2422.00 = 1240.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.56</td>
<td>9.11</td>
<td>6.261</td>
</tr>
<tr>
<td>2</td>
<td>19.64</td>
<td>9.86</td>
<td>5.952</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 2422.00 TO NODE 2418.00 IS CODE = 31

FLOW PROCESS FROM NODE 2418.00 TO NODE 2418.00 IS CODE = 11

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.64</td>
<td>11.08</td>
<td>5.519</td>
<td>12.88</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2421.00 TO NODE 2418.00 = 2035.00 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 <<<

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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 = 0.5700
- 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**

- 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 = 0.5700
- 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   HALFWIDTH FLOOD WIDTH(FEET) = 13.59
FLOW VELOCITY(FT/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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 14.00
RAINFALL INTENSITY(INCH/HOUR) = 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

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
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 <<<

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

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 = 850.00 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 FRICITION FACTOR for Streetflow Section(curb-to-curb) =  0.0150

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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

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

FLOW PROCESS FROM NODE 2417.32 TO NODE 2417.32 IS CODE = 1

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 18.00
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.

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

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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<<<<<
>>> TRAVEL TIME 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

Page 136
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

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

Page 137
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:
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 **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
<tr>
<td>1</td>
<td>323.81</td>
<td>17.34</td>
<td>4.135</td>
<td>203.54</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2417.20 TO NODE 2417.70 = 1270.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
<tr>
<td>1</td>
<td>18.93</td>
<td>9.14</td>
<td>6.249</td>
<td>7.93</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2418.50 TO NODE 2417.70 = 965.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>189.65</td>
<td>9.14</td>
<td>6.249</td>
</tr>
<tr>
<td>2</td>
<td>336.34</td>
<td>17.34</td>
<td>4.135</td>
</tr>
</tbody>
</table>

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<<<<

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 OFPIPES = 1
PIPE-FLOW(CFS) = 336.34
PIPE TRAVEL TIME(MIN.) = 0.47 Tc(MIN.) = 17.81

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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

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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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>353.62</td>
<td>18.33</td>
<td>3.990</td>
<td>219.18</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2417.20 TO NODE 2418.00 = 2530.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>145.52</td>
<td>19.37</td>
<td>3.850</td>
<td>168.39</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2599.00 TO NODE 2418.00 = 7542.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>491.30</td>
<td>18.33</td>
<td>3.990</td>
</tr>
<tr>
<td>2</td>
<td>486.74</td>
<td>19.37</td>
<td>3.850</td>
</tr>
</tbody>
</table>

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<<<<

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

FLOW PROCESS FROM NODE 2415.90 TO NODE 2415.80 IS CODE = 21

*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

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(FT/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(FT) = 0.39 HALFSTREET FLOOD WIDTH(FT) = 13.16
FLOW VELOCITY(FT/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(FT/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
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**

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
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

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

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

*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
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26.00</td>
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<td>6.535</td>
</tr>
<tr>
<td>2</td>
<td>26.11</td>
<td>9.88</td>
<td>5.944</td>
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</tbody>
</table>

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

> > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > >

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

> > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > >

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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

SUCCESSFUL TRANSFER OF WATER TO NEXT NODE COMPLETE

-END OF SUBAREA-
** 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

FLOW PROCESS FROM NODE 2380.20 TO NODE 2380.00 IS CODE = 31

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 <<<

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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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

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100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.656

*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .570
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 OFPIPES = 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(FT/SEC.) = 3.64
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.13
STREET FLOW TRAVEL TIME(MIN.) = 2.27
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(FT/SEC.) = 4.22
PRODUCT OF 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

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 OFPIPES = 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 = 700.00 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 **

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<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>26.47</td>
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<td>6.152</td>
</tr>
<tr>
<td>2</td>
<td>25.76</td>
<td>10.34</td>
<td>5.771</td>
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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<<<<<

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) = 0.0020
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(FT/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

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TOTAL AREA (ACRES) = 2.1 PEAK FLOW RATE (CFS) = 7.36

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 0.32 HALFW STREET 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

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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
P-25d.TXT

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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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.

*****************************************************************************

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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<<<<<<
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/HR) = 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

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) = 0.40  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 **

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<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
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<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
<tr>
<td>1</td>
<td>8.06</td>
<td>9.00</td>
<td>6.312</td>
<td>2.17</td>
</tr>
<tr>
<td>2</td>
<td>1.76</td>
<td>6.61</td>
<td>7.705</td>
<td>0.40</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
</table>

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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

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

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

** MAIN STREAM CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY     AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)     (ACRE)
1        9.49     9.41       6.135        2.57

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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 <<<<
============================================================================

>>>>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)
LONGEST FLOWPATH FROM NODE 2599.00 TO NODE 2380.00 = 7932.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>285.98</td>
<td>10.46</td>
<td>5.729</td>
</tr>
<tr>
<td>2</td>
<td>499.03</td>
<td>18.54</td>
<td>3.959</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 2380.00 TO NODE 2379.00 IS CODE = 52

FLOW PROCESS FROM NODE 2379.00 TO NODE 2379.00 IS CODE = 10

FLOW PROCESS FROM NODE 2378.00 TO NODE 2377.00 IS CODE = 21

*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

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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
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

*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.5700
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(费ETES) = 95.00
UPSTREAM ELEVATION(费ETES) = 920.00
DOWNSTREAM ELEVATION(费ETES) = 917.00
ELEVATION DIFFERENCE(费ETES) = 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

UPSTREAM ELEVATION(费ETES) = 917.00 DOWNSTREAM ELEVATION(费ETES) = 912.00
STREET LENGTH(费ETES) = 360.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(费ETES) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(费ETES) = 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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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(费ETES) = 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/HOUR) = 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 2370.00 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
** CONFLUENCE DATA **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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<td>1</td>
<td>12.84</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
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</tbody>
</table>

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 <<<

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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning’s FRICITION 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) = 7.508

*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  HALFWIDTH 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)<<<<<
============================================================================
P-25d.TXT

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 <<<<<

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

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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(FT) = 0.29
HALFSTREET FLOOD WIDTH(FT) = 7.97
AVERAGE FLOW VELOCITY(FT/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(FT) = 0.33  HALFSTREET FLOOD WIDTH(FT) = 10.16
FLOW VELOCITY(FT/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 **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>(CFS)</td>
<td>(MIN.)</td>
<td>(INCH/HOUR)</td>
<td>(ACRE)</td>
</tr>
<tr>
<td>1</td>
<td>23.04</td>
<td>10.03</td>
<td>5.887</td>
<td>6.49</td>
</tr>
<tr>
<td>2</td>
<td>4.18</td>
<td>7.34</td>
<td>7.197</td>
<td>1.02</td>
</tr>
</tbody>
</table>
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23.03</td>
<td>7.34</td>
<td>7.197</td>
</tr>
<tr>
<td>2</td>
<td>26.46</td>
<td>10.03</td>
<td>5.887</td>
</tr>
</tbody>
</table>

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
**P-25d.TXT**

**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**

**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
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
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.

** 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 = 11

FLOW PROCESS FROM NODE 2379.00 TO NODE 2379.00 IS CODE = 12
P-25d.TXT

>>>>>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 LACFC/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 LACFC/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.

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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 = .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 PIPE SIZE (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
PIE 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<<<<

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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 2365.00 TO NODE 2364.00 IS CODE = 53

>>> COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>> TRAVEL TIME 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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.844
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .4200
S.C.S. CURVE NUMBER (AMC II) =
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

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

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

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<<<<

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<<<<

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.

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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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>568.41</td>
<td>19.76</td>
<td>3.80</td>
<td>486.11</td>
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<td>2</td>
<td>8.52</td>
<td>12.91</td>
<td>5.00</td>
<td>3.47</td>
</tr>
<tr>
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<td>8.36</td>
<td>10.43</td>
<td>5.74</td>
<td>3.09</td>
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</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>391.55</td>
<td>10.43</td>
<td>5.74</td>
</tr>
<tr>
<td>2</td>
<td>447.68</td>
<td>12.91</td>
<td>5.00</td>
</tr>
<tr>
<td>3</td>
<td>580.42</td>
<td>19.76</td>
<td>3.80</td>
</tr>
</tbody>
</table>

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
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

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

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.842

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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):
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
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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

FILE NAME: P-34-9.DAT

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*

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

FLOW PROCESS FROM NODE 2335.00 TO NODE 2335.00 IS CODE = 1

FLOW PROCESS FROM NODE 2337.00 TO NODE 2336.00 IS CODE = 21

*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

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<th>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE</th>
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<td>TOTAL NUMBER OF STREAMS = 2</td>
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<tr>
<td>CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:</td>
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<td>TIME OF CONCENTRATION(MIN.) = 6.44</td>
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<td>RAINFALL INTENSITY(INCH/HR) = 7.83</td>
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<td>TOTAL STREAM AREA(ACRES) = 2.72</td>
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<td>PEAK FLOW RATE(CFS) AT CONFLUENCE = 20.92</td>
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FLOW PROCESS FROM NODE 2334.00 TO NODE 2333.00 IS CODE = 21

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<td>S.C.S. CURVE NUMBER (AMC II) = 0</td>
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<td>INITIAL SUBAREA FLOW-LENGTH(FEET) = 85.00</td>
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<td>UPSTREAM ELEVATION(FEET) = 841.70</td>
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<td>ELEVATION DIFFERENCE(FEET) = 4.00</td>
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<td>SUBAREA OVERLAND TIME OF FLOW(MIN.) = 1.981</td>
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<td>100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 9.222</td>
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<td>NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.</td>
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<td>SUBAREA RUNOFF(CFS) = 0.83</td>
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<td>TOTAL AREA(ACRES) = 0.10 TOTAL RUNOFF(CFS) = 0.83</td>
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FLOW PROCESS FROM NODE 2333.00 TO NODE 2332.00 IS CODE = 62

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<th>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA</th>
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<td>STREET TABLE SECTION # 1 USED</td>
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<td>UPSTREAM ELEVATION(Feet) = 837.70 DOWNSTREAM ELEVATION(Feet) = 820.00</td>
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<td>STREET LENGTH(Feet) = 315.00 CURB HEIGHT(INCHES) = 6.0</td>
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<td>STREET HALFWIDTH(Feet) = 39.00</td>
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<td>DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(Feet) = 20.00</td>
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<tr>
<td>INSIDE STREET CROSSFALL(DECIMAL) = 0.020</td>
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<tr>
<td>OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020</td>
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<tr>
<td>SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1</td>
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<tr>
<td>STREET PARKWAY CROSSFALL(DECIMAL) = 0.020</td>
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<td>Manning’s FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150</td>
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<td>Manning’s FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150</td>
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**TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2.53**

**STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:**

- STREET FLOW DEPTH (FEET) = 0.26
- HALF STREET 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**

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
- HALF STREET 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<<<<**

**LEVELS COMPUTED FOR INDEPENDENT STREAMS 1 AND 2 ARE:***

**TIME OF CONCENTRATION (MIN.) = 3.16**

**RAINFALL INTENSITY (INCH/HOUR) = 9.22**

**TOTAL STREAM AREA (ACRES) = 0.51**

**PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.23**

**CONFLUENCE DATA **

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<th>AREA (ACRE)</th>
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**RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO**

**CONFLUENCE FORMULA USED FOR 2 STREAMS.**

**PEAK FLOW RATE TABLE **

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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 OFPIPES = 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
>>> TRAVEL TIME 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 LAFCFD/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
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 2356.00 TO NODE 2355.00 IS CODE = 53

>>> 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

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

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

FLOW PROCESS FROM NODE 2354.00 TO NODE 2353.00 IS CODE = 21

*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 2352.00 TO NODE 2351.00 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<<<<<
============================================================================
P-34-9.TXT

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

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.04
ELEVATION DATA: UPSTREAM(Feet) = 839.00 DOWNSTREAM(Feet) = 821.00
FLOW LENGTH(Feet) = 390.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 240 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

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 = 0.6000
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
TRAVEL TIME 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 = 0.6000
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.6000
SUBAREA AREA(ACRES) = 2.68 SUBAREA RUNOFF(CFS) = 10.35

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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 18.00
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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34.48</td>
<td>8.85</td>
<td>6.381</td>
<td>5.044</td>
</tr>
<tr>
<td>2</td>
<td>42.60</td>
<td>12.74</td>
<td>5.044</td>
<td>2.81</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34.48</td>
<td>8.85</td>
<td>6.381</td>
</tr>
<tr>
<td>2</td>
<td>42.60</td>
<td>12.74</td>
<td>5.044</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 2346.00 TO NODE 2346.00 IS CODE = 11

** 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 OFPIPES = 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

*RUSER 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

*****************************************************************************

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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)
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

FLOW PROCESS FROM NODE 2330.00 TO NODE 2329.00 IS CODE = 31

FLOW PROCESS FROM NODE 2329.00 TO NODE 2329.00 IS CODE = 1

FLOW PROCESS FROM NODE 2327.00 TO NODE 2326.90 IS CODE = 21

*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

============================================================================
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

============================================================================
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84.64</td>
<td>13.03</td>
<td>4.972</td>
<td>38.42</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2354.00 TO NODE 2329.00 = 2325.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>79.99</td>
<td>6.85</td>
<td>7.529</td>
</tr>
<tr>
<td>2</td>
<td>108.09</td>
<td>13.03</td>
<td>4.972</td>
</tr>
</tbody>
</table>

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

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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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

FLOW PROCESS FROM NODE 2323.00 TO NODE 2323.00 IS CODE = 1

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

*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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.57</td>
<td>3.51</td>
<td>9.222</td>
<td>0.43</td>
</tr>
<tr>
<td>2</td>
<td>4.56</td>
<td>3.96</td>
<td>9.222</td>
<td>0.55</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.61</td>
<td>3.51</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>8.13</td>
<td>3.96</td>
<td>9.222</td>
</tr>
</tbody>
</table>

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 18.00
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(FOET) = 6.11
AVERAGE FLOW VELOCITY(FOET/SEC.) = 2.78
PRODUCT OF DEPTH&VELOCITY(FOET*FOET/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(FOET) = 0.28 HALFSTREET FLOOD WIDTH(FOET) = 7.89
FLOW VELOCITY(FOET/SEC.) = 3.14 DEPTH*VELOCITY(FOET*FOET/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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>2</td>
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<td>8.412</td>
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</tbody>
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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 <<<
>>> TRAVEL TIME 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<<<

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 = 0.9000
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

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

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

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TOTAL AREA(ACRES) = 0.5

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

ELEVATION DATA: UPSTREAM(Feet) = 805.00  DOWNSTREAM(Feet) = 804.20
CHANNEL LENGTH THRU SUBAREA(Feet) = 80.00  CHANNEL SLOPE = 0.0100
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 3569.00 TO NODE 3565.50 IS CODE = 31

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 = 0.4200
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 <<<

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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>TC (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>4.347</td>
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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.

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.

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

** 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

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 LACFCFD/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 3566.00 TO NODE 3565.00 IS CODE = 31
----------------------------------------------------------------------------

>>>>>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.

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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 **

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

** PEAK FLOW RATE TABLE **

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<th>STREAM</th>
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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.
 Trey.***************

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 OFPIPES = 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21.51</td>
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<td>4.176</td>
<td>10.82</td>
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</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2412.00 TO NODE 3500.00 = 2220.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>19.52</td>
<td>6.18</td>
<td>8.045</td>
<td>2.99</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2328.00 TO NODE 3500.00 = 1760.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.30</td>
<td>6.18</td>
<td>8.045</td>
</tr>
<tr>
<td>2</td>
<td>31.64</td>
<td>17.08</td>
<td>4.176</td>
</tr>
</tbody>
</table>

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31.64</td>
<td>17.23</td>
<td>4.152</td>
<td>13.81</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2412.00 TO NODE 3495.00 = 2304.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>108.09</td>
<td>14.72</td>
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<td>45.41</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 2354.00 TO NODE 3495.00 = 3960.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>135.12</td>
<td>14.72</td>
<td>4.596</td>
</tr>
<tr>
<td>2</td>
<td>129.29</td>
<td>17.23</td>
<td>4.152</td>
</tr>
</tbody>
</table>

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

DEEP DEPT 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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code 1</th>
<th>Code 2</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3515</td>
<td>3514</td>
<td>2</td>
<td>731</td>
<td>728.4</td>
<td>80</td>
<td>0.9</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>3514</td>
<td>3513</td>
<td>6</td>
<td>728.4</td>
<td>725.6</td>
<td>405</td>
<td>0.9</td>
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<tr>
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<td>3</td>
<td>720.7</td>
<td>720</td>
<td>70</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
</tbody>
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**Comments:**

- **Node to Node BANK**
  - 1
  - 2
  - 3

- **Area (ac.):**
  - 0.09
  - 0.46
  - 0.55
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 35.0                                                           *
*                                                                          *
**************************************************************************

FILE NAME: P-35-0.DAT

------------------------- 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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES</th>
<th>MANNING WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/OUT-/PARK- HEIGHT</th>
<th>WIDTH</th>
<th>LIP</th>
<th>HIKE FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>39.0</td>
<td>20.0</td>
<td>0.020/0.020/0.020</td>
<td>0.50</td>
<td>1.50</td>
<td>0.0313</td>
<td>0.125</td>
<td>0.0150</td>
</tr>
</tbody>
</table>

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

**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

Page 2
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 HALFWAY STREET 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

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.

TOTAL AREA(ACRES) = 0.6 TC(MIN.) = 5.85
PEAK FLOW RATE(CFS) = 4.23

END OF RATIONAL METHOD ANALYSIS
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
<th>BANK</th>
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</thead>
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<tr>
<td>3524</td>
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<td>1 SIDE</td>
</tr>
<tr>
<td>3522</td>
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<td>728</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
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<td>729.4</td>
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<td>0.29</td>
<td>1 SIDE</td>
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<tr>
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<td>3517</td>
<td>5</td>
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<td>727.5</td>
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<td></td>
</tr>
<tr>
<td>3517</td>
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<td>70</td>
<td>1.08</td>
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</tr>
</tbody>
</table>
Analysis prepared by:

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

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL:</th>
<th>CURB GUTTER-GEOMETRIES:</th>
<th>MANNING WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/OUT/-PARK-</th>
<th>HEIGHT</th>
<th>WIDTH</th>
<th>LIP</th>
<th>HIKE</th>
<th>FACTOR</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>39.0</td>
<td>20.0</td>
<td>0.020/0.020/0.020</td>
<td>0.50</td>
<td>1.50</td>
<td>0.0313</td>
<td>0.125</td>
<td>0.0150</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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  HALF STREET 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

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

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

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

UPSTREAM ELEVATION(FEET) = 733.50  DOWNSTREAM ELEVATION(FEET) = 729.40
STREET LENGTH(FEET) = 260.00  CURB HEIGHT(INCHES) = 6.0

Page 4
STREET HALFWIDTH (FEET) = 39.00

DISTANCE FROM CROWN TO CROSSFALL GRADBREAK (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 = 0.9000
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

Page 5
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

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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<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
<th>BANK</th>
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Node to Node BANK:
1 OF 2
2 OF 2
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*

<table>
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<th>NO.</th>
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<th>CURB GUTTER-GEOMETRIES: MANNING</th>
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</tr>
<tr>
<td></td>
<td>(FT)</td>
<td>(FT)</td>
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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<<<<<

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

-----------------------------------------------
>>IMAGE:COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>IMAGE:(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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tr>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>9.222</td>
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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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<th>Node to Node</th>
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<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
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Analysis prepared by:

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

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*

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 HALFWESTREETS 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
HALFWESTREET 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
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

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
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

FLOW PROCESS FROM NODE 3537.00 TO NODE 3533.00 IS CODE = 81
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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning’s FRICITION 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) = 9.22
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.

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 6.64 4.92 9.22 0.80
2 1.91 3.72 9.22 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 9.22
2 8.55 4.92 9.22
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

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

Page 6
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<th>Node to Node</th>
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<th>Elev 2 (feet)</th>
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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*

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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<<<<<

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 LACFC/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

Page 3
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<<<<<

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.32</td>
<td>3.36</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>5.47</td>
<td>5.12</td>
<td>9.084</td>
</tr>
</tbody>
</table>

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 18.00
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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
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<th>Area (ac.)</th>
<th>Comments</th>
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<td>755.9</td>
<td>80</td>
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<td>0.08</td>
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<td>3550</td>
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<td>755.9</td>
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<td>0.28 1 SIDE</td>
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| BANK | | | | |
|------| | | | |
| 1    | | | | |
| 2    | | | | |
| 3    | | | | |

0.46
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*

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

Page 2
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 = 0.9000
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 <<<
>>> TRAVEL TIME 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 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
<table>
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<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
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<th>C Factor</th>
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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 35.6
*
****************************************************************************
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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF- CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES</th>
<th>MANNING WIDTH</th>
<th>CROSSFALL</th>
<th>IN- / OUT-/PARK- HEIGHT</th>
<th>WIDTH</th>
<th>LIP</th>
<th>HIKE</th>
<th>FACTOR</th>
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<td>0.125</td>
<td>0.0150</td>
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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

Page 3
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

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 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

<<<<<<DEVELOP UPLAND-RIGHTS-OF-WAY DESIGN FOR CONFLUENCE<<<<<<

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<<<<<<

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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Analysis prepared by:

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

FILE NAME: P-35-7.DAT

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*

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<th>NO.</th>
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<th>CROSSFALL</th>
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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 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  HALF STREET 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 PIPE SIZE (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

>>>>(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

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
PIECE-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

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

*RUSER SPECIFIED (SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.9000
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

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

Page 7
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

**CONFLUENCE DATA**

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<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 4 STREAMS.

** PEAK FLOW RATE TABLE **

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<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>23.90</td>
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<td>6.697</td>
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</table>

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

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

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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<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
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**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**

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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING</th>
<th>WIDTH</th>
<th>CROSSFALL IN-/OUT-/PARK- HEIGHT</th>
<th>WIDTH</th>
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**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/HOUR) = 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

Page 4
P-1.TXT

TRAVEL TIME 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

TRAVEL TIME 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

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P-1.TXT

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 = 0.4100
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):
P-1.TXT

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, 10.0, 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 LACFC/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 LACFC/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<<<<<<

Page 7
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

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 = 81

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<<<<
>>>>>TRAVEL TIME 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^2/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

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

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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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>140.34</td>
<td>21.68</td>
<td>3.580</td>
<td>99.54</td>
</tr>
<tr>
<td>2</td>
<td>114.71</td>
<td>28.07</td>
<td>3.031</td>
<td>99.51</td>
</tr>
<tr>
<td>3</td>
<td>7.39</td>
<td>10.20</td>
<td>5.821</td>
<td>1.23</td>
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<tr>
<td>4</td>
<td>5.67</td>
<td>7.01</td>
<td>7.414</td>
<td>0.85</td>
</tr>
</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 4 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>107.18</td>
<td>7.01</td>
<td>7.414</td>
</tr>
<tr>
<td>2</td>
<td>139.85</td>
<td>10.20</td>
<td>5.821</td>
</tr>
<tr>
<td>3</td>
<td>236.21</td>
<td>21.68</td>
<td>3.580</td>
</tr>
<tr>
<td>4</td>
<td>239.66</td>
<td>28.07</td>
<td>3.031</td>
</tr>
</tbody>
</table>

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<<<<<

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

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**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 = 0.9000
- 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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Total: 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

******************************************************************************
* 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:

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 <<<<<<
>>>>>>>> TRAVEL TIME 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 4982.00 TO NODE 4970.00 IS CODE = 31

>>>>>>>> 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

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

*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

UPSTREAM ELEVATION(FeET) =  723.50  DOWNSTREAM ELEVATION(FeET) =  720.50
Page 4
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 NOMOGRAM 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<<<<<<
<<<<<<<<<TRAVEL TIME 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

-----------------------------

>>>ADDITON 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 = 0.300
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
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.25</td>
<td>4.89</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>15.33</td>
<td>6.13</td>
<td>8.087</td>
</tr>
</tbody>
</table>

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

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
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 <<<

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
P-2000.TXT

>>>ADDIION OF SUBAREA TO MAINLINE PEAK FLOW<<<

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.264

*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .340
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<<<

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 = .330
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<<<

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

Page 10
TOTAL STREAM AREA (ACRES) = 55.63
PEAK FLOW RATE (CFS) AT CONFLUENCE = 61.52

** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tbody>
<tr>
<td>1</td>
<td>6.64</td>
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<td>9.222</td>
<td>0.80</td>
</tr>
<tr>
<td>2</td>
<td>61.52</td>
<td>24.30</td>
<td>3.326</td>
<td>55.63</td>
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</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.05</td>
<td>4.51</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>63.91</td>
<td>24.30</td>
<td>3.326</td>
</tr>
</tbody>
</table>

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

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>63.91</td>
<td>24.36</td>
<td>3.321</td>
<td>56.43</td>
</tr>
</tbody>
</table>
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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
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</table>
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
<table>
<thead>
<tr>
<th>Node to Node</th>
<th>Code 1</th>
<th>Elev 1 (feet)</th>
<th>Elev 2 (feet)</th>
<th>Length (feet)</th>
<th>C Factor</th>
<th>Area (ac.)</th>
<th>Comments</th>
<th>BANK</th>
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<td>955</td>
<td>0.9</td>
<td>1.42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>(FT)</th>
<th>SIDE</th>
<th>SIDE</th>
<th>WAY</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(n)</th>
</tr>
</thead>
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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 <<<<

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(FT/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  HALF STREET 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

*
# Newland Sierra

**Job #:** 2660-02  
**Run Name:** P-6000.dat  
Page 1 of 1

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**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*

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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<<<<

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 \( T_c \) 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<<<<<

CHANNEL LENGTH THRU SUBAREA(FeET) = 1411.00
CHANNEL SLOPE = 0.2495
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = 0.1798 (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 \( T_c \)(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<<<<<<

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 1.0 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 = 0.3600
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

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(MN.) = 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(MN.) = 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<<<
>>> TRAVEL TIME 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56.05</td>
<td>19.72</td>
<td>3.806</td>
<td>40.91</td>
</tr>
<tr>
<td>2</td>
<td>10.53</td>
<td>5.51</td>
<td>8.666</td>
<td>2.66</td>
</tr>
</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35.14</td>
<td>5.51</td>
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<td>2</td>
<td>60.67</td>
<td>19.72</td>
<td>3.806</td>
</tr>
</tbody>
</table>

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<<<<<<
>>>>>TRAVEL TIME 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
** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>73.02</td>
<td>22.27</td>
<td>3.518</td>
<td>57.3</td>
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</table>

LONGEST FLOWPATH FROM NODE 1090.00 TO NODE 1015.00 = 4033.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48.01</td>
<td>32.00</td>
<td>2.785</td>
<td>50.68</td>
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</tbody>
</table>

LONGEST FLOWPATH FROM NODE 1110.00 TO NODE 1015.00 = 3547.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>106.44</td>
<td>22.27</td>
<td>3.518</td>
</tr>
<tr>
<td>2</td>
<td>105.82</td>
<td>32.00</td>
<td>2.785</td>
</tr>
</tbody>
</table>

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 = 11

FLOW PROCESS FROM NODE 1015.00 TO NODE 1015.00 IS CODE = 12

FLOW PROCESS FROM NODE 1015.00 TO NODE 4942.00 IS CODE = 53

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 = 0.0182 (PER LACFCD/RCFC&WC 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!

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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

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

FLOW PROCESS FROM NODE 4954.00 TO NODE 4942.00 IS CODE = 31

FLOW PROCESS FROM NODE 4954.00 TO NODE 4942.00 IS CODE = 31

FLOW PROCESS FROM NODE 4954.00 TO NODE 4942.00 IS CODE = 31

FLOW PROCESS FROM NODE 4954.00 TO NODE 4942.00 IS CODE = 31
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.

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

*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 4942.00 TO NODE 4942.00 IS CODE = 1
FLOW PROCESS FROM NODE 4948.00 TO NODE 4946.00 IS CODE = 21
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 GRADEREAK (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

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 18.00
DEPTH OF FLOW IN 18.00 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

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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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(FT/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(FeETEELS) = 14.18
FLOW VELOCITY(FT/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
** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47.17</td>
<td>5.63</td>
<td>8.541</td>
</tr>
<tr>
<td>2</td>
<td>48.01</td>
<td>5.76</td>
<td>8.414</td>
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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

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

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</table>
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*

<table>
<thead>
<tr>
<th>NO.</th>
<th>HALF- CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>IN- / OUT- / PARK- HEIGHT</th>
<th>WIDTH</th>
<th>LIP</th>
<th>HIKE FACTOR</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
<th>(FT)</th>
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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(FT) = 0.26  HALFSTREET FLOOD WIDTH(FT) = 7.34  
FLOW VELOCITY(FT/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(FT) = 1441.00  DOWNSTREAM(FT) = 1440.00  
FLOW LENGTH(FT) = 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(FT/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(FT) = 95.00  
UPSTREAM ELEVATION(FT) = 1464.00  
DOWNSTREAM ELEVATION(FT) = 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

FLOW PROCESS FROM NODE 2690.00 TO NODE 2692.00 IS CODE = 62

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning's FRICITION 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.
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 **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<td>8.97</td>
<td>6.325</td>
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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(FT/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 = 0.3500
- 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

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 **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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<td>6.120</td>
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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 18.00
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.

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FLOW PROCESS FROM NODE 2688.00 TO NODE 2688.00 IS CODE = 1

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>>> 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

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 OFPIPES = 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.

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FLOW PROCESS FROM NODE 2688.00 TO NODE 2688.00 IS CODE = 1

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>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUED 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.

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FLOW PROCESS FROM NODE 2688.00 TO NODE 2681.00 IS CODE = 31

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>>>>>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

FLOW PROCESS FROM NODE 2687.00 TO NODE 2686.00 IS CODE = 21

*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

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 18.00
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 <<<
>>> TRAVEL TIME 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 = 0.583
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)<<

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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
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<<<<

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 HALFWESTREETS 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
HALFW STREET 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 HALFW STREET 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<<<<<
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

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) = 2.40  TOTAL RUNOFF(CFS) = 5.40
Tc(MIN.) = 8.80

FLOW PROCESS FROM NODE 2673.00 TO NODE 2672.00 IS CODE = 31

FLOW PROCESS FROM NODE 2672.00 TO NODE 2672.00 IS CODE = 1

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

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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 NUMBER  RUNOFF (CFS)  Tc (MIN.)  INTENSITY (INCH/HOUR)  AREA (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 NUMBER  RUNOFF (CFS)  Tc (MIN.)  INTENSITY (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

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>>>>>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

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>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

Page 21
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
>>> TRAVEL TIME 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 <<<<<

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning's FRICITION 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

FLOW PROCESS FROM NODE 2663.00 TO NODE 2663.00 IS CODE = 1

** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.59</td>
<td>12.68</td>
<td>5.061</td>
<td>4.34</td>
</tr>
<tr>
<td>2</td>
<td>5.46</td>
<td>13.26</td>
<td>4.917</td>
<td>3.17</td>
</tr>
<tr>
<td>3</td>
<td>11.64</td>
<td>10.85</td>
<td>5.594</td>
<td>4.47</td>
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</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22.60</td>
<td>10.85</td>
<td>5.594</td>
</tr>
<tr>
<td>2</td>
<td>23.34</td>
<td>12.68</td>
<td>5.061</td>
</tr>
<tr>
<td>3</td>
<td>23.06</td>
<td>13.26</td>
<td>4.917</td>
</tr>
</tbody>
</table>

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
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

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 = 0.4500
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)<<<<<

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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

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

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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.

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 2650.70 TO NODE 2650.60 IS CODE = 31
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 2650.60 = 2367.00 FEET.

FLOW PROCESS FROM NODE 2650.00 TO NODE 2650.00 IS CODE = 10
FLOW PROCESS FROM NODE 2656.00 TO NODE 2655.00 IS CODE = 21

*RUSER 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

**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

FLOW PROCESS FROM NODE 2651.00 TO NODE 2651.00 IS CODE = 11

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 OFPIPES = 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**: 0.4700
- **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<<<<<<

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

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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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.14</td>
<td>10.91</td>
<td>5.575</td>
<td>6.03</td>
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<tr>
<td>2</td>
<td>10.33</td>
<td>11.09</td>
<td>5.516</td>
<td>4.14</td>
</tr>
</tbody>
</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26.31</td>
<td>10.91</td>
<td>5.575</td>
</tr>
<tr>
<td>2</td>
<td>26.30</td>
<td>11.09</td>
<td>5.516</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 2640.00 TO NODE 2640.00 IS CODE = 1

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 HALFWESTREETS 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
HALFWESTREET 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

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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(FT/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
>> TRAVEL TIME 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

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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) = 5.047
*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 )

** Peak Flow Rate Table **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>129.44</td>
<td>12.76</td>
<td>5.040</td>
</tr>
<tr>
<td>2</td>
<td>135.38</td>
<td>13.98</td>
<td>4.751</td>
</tr>
</tbody>
</table>

** 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**

----------------------------------------------------------------------------

**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:** 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**
*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

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 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

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

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

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

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 **
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)
1 136.68 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

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

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

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
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

FLOW PROCESS FROM NODE 2624.00 TO NODE 2623.00 IS CODE = 31

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
DE PHT 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

FLOW PROCESS FROM NODE 2622.00 TO NODE 2621.00 IS CODE = 21

*RUSER 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<<<<
TRAVEL TIME 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 = 0.1530 (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

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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
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 10.07
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
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

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PIPE-FLOW VELOCITY (FEET/SEC.) = 7.04  
ESTIMATED PIPE DIAMETER (INCH) = 18.00  NUMBER OF PIPES = 1  
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

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<td>1</td>
<td>6.81</td>
<td>11.66</td>
<td>5.341</td>
<td>3.64</td>
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<tr>
<td>2</td>
<td>10.29</td>
<td>10.51</td>
<td>5.711</td>
<td>3.76</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.43</td>
<td>10.51</td>
<td>5.711</td>
</tr>
<tr>
<td>2</td>
<td>16.44</td>
<td>11.66</td>
<td>5.341</td>
</tr>
</tbody>
</table>

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

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

FLOW PROCESS FROM NODE 2611.00 TO NODE 2610.00 IS CODE = 21

FLOW PROCESS FROM NODE 2610.00 TO NODE 2609.00 IS CODE = 62

*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 2609.00 TO NODE 2608.00 IS CODE = 62

UPSTREAM ELEVATION (FEET) = 1290.00 DOWNSTREAM ELEVATION (FEET) = 1265.00
STREET LENGTH (FEET) = 435.00 CURB HEIGHT (INCHES) = 6.0
STREET HALF WIDTH (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

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**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

EFLOW LENGTH(Feet) = 275.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.00

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

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 FRICITION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICITION 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

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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

********** CONFLUENCE FORMULA USED FOR 2 STREAMS. **********
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
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 2606.20 IS CODE = 31

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<<<

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
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.47</td>
<td>8.98</td>
<td>6.319</td>
<td>3.07</td>
</tr>
<tr>
<td>2</td>
<td>2.25</td>
<td>8.29</td>
<td>6.658</td>
<td>0.75</td>
</tr>
</tbody>
</table>

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** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.24</td>
<td>8.29</td>
<td>6.658</td>
</tr>
<tr>
<td>2</td>
<td>11.61</td>
<td>8.98</td>
<td>6.319</td>
</tr>
</tbody>
</table>

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 18.00

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
-------------------------------------------------------------------

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

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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

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

FLOW PROCESS FROM NODE   2616.80 TO NODE   2612.00 IS CODE = 31

FLOW PROCESS FROM NODE   2612.00 TO NODE   2612.00 IS CODE = 1

FLOW PROCESS FROM NODE   2615.00 TO NODE   2614.00 IS CODE = 21

*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 <<<<<

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 2613.00 TO NODE 2612.00 IS CODE = 31

>>> 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 OFPIPES = 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 **

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<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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<tbody>
<tr>
<td>1</td>
<td>31.08</td>
<td>12.91</td>
<td>5.000</td>
<td>13.56</td>
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<td>1.24</td>
<td>11.00</td>
<td>5.546</td>
<td>0.89</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</thead>
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<tr>
<td>1</td>
<td>27.71</td>
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<tr>
<td>2</td>
<td>32.21</td>
<td>12.91</td>
<td>5.000</td>
</tr>
</tbody>
</table>

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 PIPE SIZE (NON-PRESSURE FLOW)<<<

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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 <<<

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
**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) = 6.11**

**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**

**FLOW PROCESS FROM NODE 294.00 TO NODE 294.00 IS CODE = 10**

**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

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*FLOW 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

---------------------------------------------------------------------------------------------------------------------------
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

---------------------------------------------------------------------------------------------------------------------------
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

---------------------------------------------------------------------------------------------------------------------------
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.4500
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

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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) <<<
============================================================================
Page 77
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 18.00
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

Page 78
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

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

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

** 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

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

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

*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

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

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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4.42</td>
<td>10.71</td>
<td>5.64</td>
<td>3.04</td>
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</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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<tbody>
<tr>
<td>1</td>
<td>38.90</td>
<td>10.71</td>
<td>5.641</td>
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<tr>
<td>2</td>
<td>48.41</td>
<td>13.88</td>
<td>4.773</td>
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</table>

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

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

** MAIN STREAM CONFLUENCE DATA **

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<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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</thead>
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<td>48.41</td>
<td>14.47</td>
<td>4.647</td>
<td>22.74</td>
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LONGEST FLOWPATH FROM NODE 2622.00 TO NODE 287.00 = 2855.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>153.85</td>
<td>15.65</td>
<td>4.418</td>
<td>76.75</td>
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LONGEST FLOWPATH FROM NODE 2696.00 TO NODE 287.00 = 4805.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</tbody>
</table>

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 <<<<

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 = 0.4500
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 = 0.4500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500

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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

FLOW PROCESS FROM NODE 259.00 TO NODE 259.00 IS CODE = 10

FLOW PROCESS FROM NODE 283.00 TO NODE 282.00 IS CODE = 21

*RUSER 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

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.

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 OFPIPES = 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.

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 **

<table>
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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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</thead>
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<tr>
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<td>8.55</td>
<td>9.35</td>
<td>6.157</td>
</tr>
</tbody>
</table>

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

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 OFPIPES = 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

TOTAL NUMBER OF STREAMS = 2
P-26D.TXT

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
  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

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P-26D.TXT

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  HALF STREET 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
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<tbody>
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<td>7.82</td>
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<td>2.82</td>
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</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>16.36</td>
<td>9.46</td>
<td>6.113</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 277.00 TO NODE 275.00 IS CODE = 1

FLOW PROCESS FROM NODE 275.00 TO NODE 275.00 IS CODE = 21

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
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 CROSSELL 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:
S T R E E T  F L O W  D E P T H(FEET) = 0.18
H A L F S T R E E T  F L O O D  W I D T H(FEET) = 3.41
A V E R A G E  F L O W  V E L O C I T Y(FEET/SEC.) = 3.80
P R O D U C T  O F  D E P T H&V E L O C I T Y(FT*FT/SEC.) = 0.70
S T R E E T  F L O W  T R A V E L  T I M E(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

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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

>>>>(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 FRICITION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICITION 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

>>>>(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 18.00
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 OFPIPES = 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

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 (ACRE) = 2.01
Peak flow rate (CFS) at confluence = 5.47

** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17.54</td>
<td>10.14</td>
<td>5.845</td>
<td>6.26</td>
</tr>
<tr>
<td>2</td>
<td>5.47</td>
<td>9.71</td>
<td>6.012</td>
<td>2.01</td>
</tr>
</tbody>
</table>

Rainfall intensity and time of concentration ratio
Confluence formula used for 2 streams.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22.52</td>
<td>9.71</td>
<td>6.012</td>
</tr>
<tr>
<td>2</td>
<td>22.86</td>
<td>10.14</td>
<td>5.845</td>
</tr>
</tbody>
</table>

Computed confluence estimates are as follows:
Peak flow rate (CFS) = 22.86    Tc (MIN.) = 10.14
Total area (ACRE) = 8.3
Longest flowpath from node 283.00 to node 293.20 = 1150.00 FEET.

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning’s FRICITION 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**

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**

<table>
<thead>
<tr>
<th>ELEVATION DATA: UPSTREAM(Feet) = 1227.00 DOWNSTREAM(Feet) = 1217.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW LENGTH(Feet) = 560.00 MANNING'S N = 0.013</td>
</tr>
<tr>
<td>ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000</td>
</tr>
<tr>
<td>DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.5 INCHES</td>
</tr>
<tr>
<td>PIPE-FLOW VELOCITY(Feet/SEC.) = 7.35</td>
</tr>
<tr>
<td>ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF Pipes = 1</td>
</tr>
<tr>
<td>PIPE-FLOW(CFS) = 6.03</td>
</tr>
<tr>
<td>PIPE TRAVEL TIME(MIN.) = 1.27 Tc(MIN.) = 15.19</td>
</tr>
<tr>
<td>LONGEST FLOWPATH FROM NODE 272.00 TO NODE 265.00 = 1490.00 FEET.</td>
</tr>
</tbody>
</table>

**DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE**

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF STREAMS = 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:</td>
</tr>
<tr>
<td>TIME OF CONCENTRATION(MIN.) = 15.19</td>
</tr>
<tr>
<td>RAINFALL INTENSITY(INCH/HR) = 4.50</td>
</tr>
<tr>
<td>TOTAL STREAM AREA(ACRES) = 2.81</td>
</tr>
<tr>
<td>PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.03</td>
</tr>
</tbody>
</table>

---
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

UPSTREAM ELEVATION(_FEET) = 1233.00 DONWSTREAM 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(FT/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 = 0.4500
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

** 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.

** 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.)
 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

FLOW PROCESS FROM NODE 264.00 TO NODE 260.40 IS CODE = 31

FLOW PROCESS FROM NODE 264.00 TO NODE 264.00 IS CODE = 11

FLOW PROCESS FROM NODE 264.00 TO NODE 264.00 IS CODE = 12

FLOW PROCESS FROM NODE 264.00 TO NODE 264.00 IS CODE = 11
P-26D.TXT

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

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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 OFPIPES = 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

ecompute pipe-flow travel time thru subarea

==compute 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

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
P-26D.TXT

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 18.00
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.7 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 7.44
ESTIMATED PIPE DIAMETER(INCH) = 18.0 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

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** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>41.24</td>
<td>10.14</td>
<td>5.843</td>
</tr>
<tr>
<td>2</td>
<td>43.76</td>
<td>11.46</td>
<td>5.400</td>
</tr>
</tbody>
</table>

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.

** MAIN STREAM CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM</th>
<th>RUNOFF</th>
<th>Tc</th>
<th>INTENSITY</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>43.76</td>
<td>11.70</td>
<td>5.329</td>
<td>19.11</td>
</tr>
</tbody>
</table>

LONGEST FLOWPATH FROM NODE 272.00 TO NODE 259.00 = 2727.00 FEET.
LONGEST FLOWPATH FROM NODE 286.00 TO NODE 259.00 = 640.00 FEET.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44.33</td>
<td>9.71</td>
<td>6.010</td>
</tr>
<tr>
<td>2</td>
<td>50.86</td>
<td>11.70</td>
<td>5.329</td>
</tr>
</tbody>
</table>

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

FLOW PROCESS FROM NODE 259.00 TO NODE 258.00 IS CODE = 31

FLOW PROCESS FROM NODE 258.00 TO NODE 246.00 IS CODE = 51

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.
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

FLOW PROCESS FROM NODE 257.00 TO NODE 256.00 IS CODE = 21

**MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2**

**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**

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:
P-26D.TXT

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

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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 <<<<<

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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

Page 115
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

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

** 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  

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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

FLOW LENGTH (FEET) = 450.00   MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 36.3 INCHES
ESTIMATED PIPE DIAMETER (INCH) = 51.00   NUMBER OF PIPES = 1
PIPE FLOW VELOCITY (FEET/SEC.) = 13.38
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

FLOW LENGTH (FEET) = 170.00   MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 17.6 INCHES
ESTIMATED PIPE DIAMETER (INCH) = 27.00   NUMBER OF PIPES = 1
PIPE FLOW VELOCITY (FEET/SEC.) = 52.87
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

FLOW LENGTH (FEET) = 1180.00   CHANNEL SLOPE = 0.1085
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = 0.1064 (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

>>ADDITIOON 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

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232.81
Analysis prepared by:

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

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*

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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 = 0.520
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 **

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<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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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

FLOW PROCESS FROM NODE 2791.00 TO NODE 2791.00 IS CODE = 1

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 = 0.5200
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

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FLOW PROCESS FROM NODE  2789.00 TO NODE  2788.00 IS CODE = 62

>>>>(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

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TOTAL STREAM AREA (ACRES) = 2.77
PEAK FLOW RATE (CFS) AT CONFLUENCE = 9.18

** CONFLUENCE DATA **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21.28</td>
<td>9.99</td>
<td>5.901</td>
<td>6.54</td>
</tr>
<tr>
<td>2</td>
<td>9.18</td>
<td>7.91</td>
<td>6.862</td>
<td>2.77</td>
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</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.48</td>
<td>7.91</td>
<td>6.862</td>
</tr>
<tr>
<td>2</td>
<td>29.17</td>
<td>9.99</td>
<td>5.901</td>
</tr>
</tbody>
</table>

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<<<<<

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<<<<
>>>=TRAVEL TIME 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 2780.00 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 = 0.1239 (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 PIIPESIZE (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 = 0.0696 (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

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

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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.10</td>
<td>16.28</td>
<td>4.306</td>
<td>6.73</td>
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<tr>
<td>2</td>
<td>2.46</td>
<td>23.24</td>
<td>3.423</td>
<td>2.05</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.82</td>
<td>16.28</td>
<td>4.306</td>
</tr>
<tr>
<td>2</td>
<td>10.48</td>
<td>23.24</td>
<td>3.423</td>
</tr>
</tbody>
</table>

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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

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 OFPIPES = 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

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

** PEAK FLOW RATE TABLE **
STREAM | RUNOFF (CFS) | Tc (MIN.) | INTENSITY (INCH/HOUR) | AREA (ACRE)
-------|--------------|-----------|-----------------------|----------
1      | 11.02        | 7.00      | 7.425                 | 10.9     
2      | 14.30        | 17.59     | 4.097                 | 9.31     

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

---

** MAIN STREAM CONFLUENCE DATA **
STREAM | RUNOFF (CFS) | Tc (MIN.) | INTENSITY (INCH/HOUR) | AREA (ACRE)
-------|--------------|-----------|-----------------------|----------
1      | 14.30        | 17.59     | 4.097                 | 9.31     

LONGEST FLOWPATH FROM NODE 2779.40 TO NODE 2787.00 = 2045.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM | RUNOFF (CFS) | Tc (MIN.) | INTENSITY (INCH/HOUR) | AREA (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 (CFS) | Tc (MIN.) | INTENSITY (INCH/HOUR) | AREA (ACRE)
-------|--------------|-----------|-----------------------|----------
1      | 37.43        | 10.16     | 5.838                 | 9.31     
2      | 34.77        | 17.59     | 4.097                 | 9.31     

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 VELOCITY(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 LACFC/D/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

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

FLOW PROCESS FROM NODE  2782.00 TO NODE  2779.40 IS CODE = 53

FLOW PROCESS FROM NODE  2782.00 TO NODE  2777.00 IS CODE = 53

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  2777.00 TO NODE  2779.40 IS CODE = 53

FLOW PROCESS FROM NODE  2779.40 TO NODE  2783.00 IS CODE = 53

FLOW PROCESS FROM NODE  2783.00 TO NODE  2782.00 IS CODE = 81

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  2779.40 IS CODE = 53

FLOW PROCESS FROM NODE  2779.40 TO NODE  2783.00 IS CODE = 53
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
----------------------------------------------------------------------------
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.

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 2780.00 TO NODE 2779.00 IS CODE = 81

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.

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 CONFLUED 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70.71</td>
<td>19.90</td>
<td>3.783</td>
<td>76.38</td>
</tr>
<tr>
<td>2</td>
<td>25.86</td>
<td>16.58</td>
<td>4.256</td>
<td>24.31</td>
</tr>
</tbody>
</table>

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>88.72</td>
<td>16.58</td>
<td>4.256</td>
</tr>
<tr>
<td>2</td>
<td>93.70</td>
<td>19.90</td>
<td>3.783</td>
</tr>
</tbody>
</table>

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<<<

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

ELEVATION DATA: UPSTREAM(FEET) = 1155.00 DOWNSTREAM(FEET) = 1035.00
CHANNEL LENGTH THRU SUBAREA(Feet) = 440.00 CHANNEL SLOPE = 0.2386
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1762 (PER LACFC/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 LACFC/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 2773.00 TO NODE 2772.00 IS CODE = 53

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<<<

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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

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

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<<<<

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
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 = 0.1861 (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.

100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 4.674
*USER SPECIFIED (SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.2500
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

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

*USER SPECIFIED (SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.2500
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
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 <<<<
>>> TRAVEL TIME 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 2766.00 TO NODE 2765.00 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 <<<<
>>> TRAVEL TIME 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

100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 4.827
*USER SPECIFIED (SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.2500
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

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 **

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<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>TC (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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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.

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FLOW PROCESS FROM NODE 2711.00 TO NODE 27.00 IS CODE = 81

>>>ADDION 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
THE FOLLOWING SUBBASINS OF MAJOR BASIN D
HAVE NO GRADING, THUS THERE IS NO CHANGE IN HYDROLOGY FOR
THE PROPOSED CONDITION.

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31
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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

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*

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(FT/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 18.00
DEPT 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 <<<

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 FRICITION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning's FRICITION 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>7.06</td>
<td>4.37</td>
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<td>2.43</td>
<td>2.36</td>
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</table>

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

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.26</td>
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</tr>
<tr>
<td>2</td>
<td>9.50</td>
<td>4.37</td>
<td>9.222</td>
</tr>
</tbody>
</table>

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 = 0.8800
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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.93</td>
<td>2.44</td>
<td>9.222</td>
</tr>
<tr>
<td>2</td>
<td>11.93</td>
<td>4.75</td>
<td>9.222</td>
</tr>
</tbody>
</table>

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

FLOW LENGTH (FEET) = 328.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) = 18.00
PEAK FLOW RATE (CFS) = 11.93
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

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

FLOW PROCESS FROM NODE 2851.00 TO NODE 2849.00 IS CODE = 2

*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  

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-cur) = 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 = 0.8900  
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

FLOW PROCESS FROM NODE 2828.00 TO NODE 2828.00 IS CODE = 7

FLOW PROCESS FROM NODE 2847.00 TO NODE 2846.00 IS CODE = 21

*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

ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
PIPE-FLOW VELOCITY(FT/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.

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

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
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

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 2840.00 TO NODE 2839.00 IS CODE = 31

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

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
FLOW VELOCITY (FEET/SEC) = 3.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME (MIN.) = 10.83
LONGEST FLOWPATH FROM NODE 2842.00 TO NODE 2843.00 = 568.00 FEET.

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 **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24.83</td>
<td>10.93</td>
<td>5.567</td>
<td>13.27</td>
</tr>
<tr>
<td>2</td>
<td>3.20</td>
<td>10.83</td>
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<td>1.83</td>
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</tbody>
</table>

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/HR) |
|---------------|--------------|-----------|---------------------|-------------|
### 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.

<table>
<thead>
<tr>
<th>Node</th>
<th>PeaK FLOW Rate (CFS)</th>
<th>Tc (MIN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.79</td>
<td>10.83</td>
</tr>
<tr>
<td>2</td>
<td>28.01</td>
<td>10.93</td>
</tr>
</tbody>
</table>

**Total Area (Acres):** 21.3

**Total Runoff (CFS):** 32.77

**TC (MIN.):** 12.89

**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**

**FLOW PROCESS FROM NODE 2838.00 TO NODE 2838.00 IS CODE = 1**

**ADDIGN OF SUBAREA TO MAINLINE PEAK FLOW**

**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

**LONGEST FLOWPATH FROM NODE 2847.00 TO NODE 2838.00:** 1863.00 FEET.

**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 SUBARENA 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<<<
>>>TRAVEL TIME 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 **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
<th>AREA (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32.77</td>
<td>12.89</td>
<td>5.007</td>
<td>21.34</td>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50.61</td>
<td>12.89</td>
<td>5.007</td>
</tr>
<tr>
<td>2</td>
<td>50.44</td>
<td>14.07</td>
<td>4.732</td>
</tr>
</tbody>
</table>

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 SLOPc 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&WCFC HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      50.71
FLOW VELOCITY(Feet/Sec) =   7.82 (PER LACFCD/RCFC&WCFC 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

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 2829.00 TO NODE 2832.00 IS CODE = 31

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

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) = 18.000   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 **
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<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
<th>AREA (ACRE)</th>
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<tbody>
<tr>
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<td>57.40</td>
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<td>44.38</td>
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<td>2</td>
<td>14.26</td>
<td>9.83</td>
<td>5.963</td>
<td>7.49</td>
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</tbody>
</table>

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

** PEAK FLOW RATE TABLE **
<table>
<thead>
<tr>
<th>STREAM NUMBER</th>
<th>RUNOFF (CFS)</th>
<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HR)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>57.58</td>
<td>9.83</td>
<td>5.963</td>
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<tr>
<td>2</td>
<td>68.16</td>
<td>15.20</td>
<td>4.501</td>
</tr>
</tbody>
</table>

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) <<<

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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(FT/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(FT/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(FT) = 95.00
UPSTREAM ELEVATION(FT) = 1025.00
DOWNSTREAM ELEVATION(FT) = 1012.00
ELEVATION DIFFERENCE(FT) = 13.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 1.792
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.0%, 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

UPSTREAM ELEVATION(FT) = 1012.00 DOWNSTREAM ELEVATION(FT) = 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 = 574.00 FEET.

FLOW PROCESS FROM NODE 2824.00 TO NODE 2823.00 IS CODE = 31

-----------------------------------------------
>> COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA <<<<
ENDED 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<<<<
>>>TRAVEL TIME 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

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.

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

FLOW VELOCITY (FEET/SEC) = 4.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME (MIN.) = 2.77 Tc (MIN.) = 9.19
LONGEST FLOWPATH FROM NODE 2820.00 TO NODE 2819.00 = 560.00 FEET.
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 <<<
>> TRAVEL TIME 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

-------------------------------------------------------------------------------------------------------

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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(FTA) =   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

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

100 YEAR RAINFALL INTENSITY (INCH/HOUR) = 3.908
*USER SPECIFIED (SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = 0.2900
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 **

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<th>STREAM NUMBER</th>
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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

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<th>STREAM NUMBER</th>
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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

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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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Analysis prepared by:

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

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*

<table>
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<th>NO.</th>
<th>HALF-CROWN TO STREET-CROSSFALL</th>
<th>CURB GUTTER-GEOMETRIES: MANNING</th>
<th>WIDTH</th>
<th>CROSSFALL</th>
<th>IN-/OUT-/PARK-GEOMETRIES</th>
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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 <<<
>>> TRAVEL TIME 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

*******************************************************************************

Page 2
FLOW PROCESS FROM NODE  2915.00 TO NODE  2915.00 IS CODE =   7

============================================================================

USER SPECIFIED HYDROLOGY INFORMATION AT NODE
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
TRAVEL TIME 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 <<<

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 LACFC/RCAF&C 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 18.00
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 **
## Rainfall Intensity and Time of Concentration Ratio

Confluence formula used for 2 streams.

---

### Peak Flow Rate Table

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<tr>
<th>Stream Number</th>
<th>Runoff (CFS)</th>
<th>Tc (Min.)</th>
<th>Intensity (Inch/Hour)</th>
<th>Area (ACRE)</th>
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<td>10.44</td>
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<td>2.40</td>
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---

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 **

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<tr>
<th>STREAM NUMBER</th>
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<th>Tc (MIN.)</th>
<th>INTENSITY (INCH/HOUR)</th>
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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
TRAVEL TIME 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 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
TRAVEL TIME 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 = 0.3500
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 <<<

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 = 0.0554 (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 <<<<
>>> TRAVEL TIME 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 = 0.0567 (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.

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 <<<<
>>> TRAVEL TIME 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 = 0.1983 (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