A FINAL CEQA LEVEL DRAINAGE REPORT FOR:

LILAC HILLS RANCH MASTER TM TM 5571 RPL-5

San Diego County, California

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DAVID YEH, RCE 62717, EXP 6-30-16

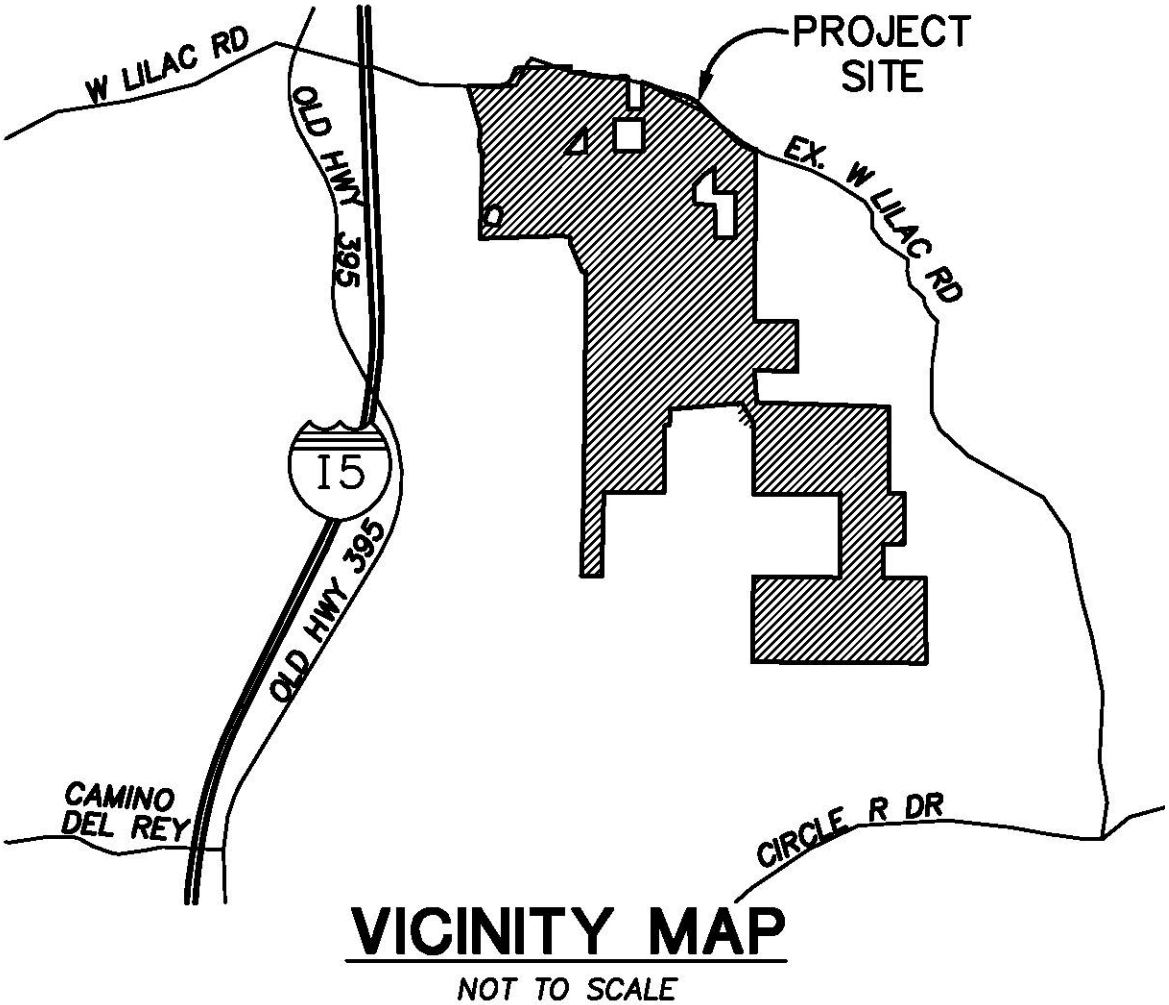
TABLE OF CONTENTS

	PAGE
DISCUSSION	5-13
PURPOSE OF PROJECT	5
VICINITY MAP	5
DESCRIPTION OF WATERSHED	7
METHODOLOGY	8-13
SUMMARY	13
PEAK RUNOFF RATES	13
PEAK RUNOFF VOLUMES	13
DECLARATION OF RESPONSIBLE CHARGE	15
100-YEAR HYDROLOGY CALCULATIONS	17-184
PRE-DEVELOPMENT CONDITIONS	17-70
POST-DEVELOPMENT CONDITIONS	71-184
100-YEAR HYDROGRAPH CALCULATIONS	185-244
PRE-DEVELOPMENT CONDITIONS	182-218
POST-DEVELOPMENT CONDITIONS	219-244
100-YEAR HYDROLOGY CALCULATIONS FOR OFF-SITE IMPROVEMENTS	245-250
APPENDIX	251
HYDROLOGIC SOILS GROUP MAP	
RUNOFF COEFFICIENT	
100-YEAR, 6-HOUR PRECIPITATION	
RUNOFF CURVE NUMBERS	
HYDROLOGY MAPS	253
ADDENDUM FOR PERMEABLE PAVERS	255-258

DISCUSSION

PURPOSE FOR PROJECT

The purpose of this project is to subdivide 610.7 acres of rural land into a master-planned community with residential, commercial, schools, parks and extensive open spaces. The project site situated on the northeasterly upstream of a much larger watershed that drains southwesterly into San Luis Rey River.



The purpose of this report is to determine the peak runoff rates under the mass grading phase (i.e. Master TM) from the site and compare them to the pre-development, natural state runoff rate. The pre- and post-development runoff volumes will also be analyzed to determine the required detention basin storage volume. The post-development runoff volume is based on the ultimate build-out conditions of the project. This report will access appropriate drainage infrastructure required to mitigate the anticipated increase in runoff volume from each basin due to the proposed development. The goal of the proposed drainage infrastructure will be to reduce post-development runoff volume to pre-development levels such that the proposed development will not negatively impact existing downstream facilities.

DESCRIPTION OF WATERSHED

The project is located on the east side of Interstate 15, southerly of W. Lilac Road in the County of San Diego, State of California.

Under the existing conditions, there are three sub-basins on the project site - the northerly, central and southerly sub-basins. The northerly sub-basin drains the southwesterly along a web of natural drainage channels and into a major natural channel along the westerly project boundary.

The central sub-basin also drains southwesterly and into the same westerly natural channel along the westerly project boundary, approximately 1000' southerly of the discharge point from the northerly sub-basin.

The southerly sub-basin drains westerly across the project site and into a tributary of the westerly natural channel.

The proposed development will be split into several phases through several successive implementing tentative maps. The Master TM consists of the construction of the backbone roads, the mass grading of the proposed pads and secondary roads and the mapping of large neighborhood parcels. Temporary storm drains will be installed to convey upstream runoff through the mass-graded site and to the downstream discharge points. The overall pre-development drainage pattern will be preserved. Due to the proposed increase in impervious areas such as roadways, roof tops, driveways and sidewalks. The runoff rate and volume is anticipated to increase significantly. Detention facilities will be sized to store the anticipated excess runoff volume based on the project ultimate build-out. The hydraulics of proposed storm drain systems and detention basin outlets will not be analyze in this report, they will be analyzed during final engineering phase of the project.

METHODOLOGY

3.1 THE RATIONAL METHOD

The Rational Method (RM) is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage, where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and small drainage structures. The RM is recommended for analyzing the runoff response from drainage areas up to approximately 1 square mile in size. It should not be used in instances where there is a junction of independent drainage systems or for drainage areas greater than approximately 1 square mile in size. In these instances, the Modified Rational Method (MRM) should be used for junctions of independent drainage systems in watersheds up to approximately 1 square mile in size (see Section 3.4); or the NRCS Hydrologic Method should be used for watersheds greater than approximately 1 square mile in size (see Section 4).

The RM can be applied using any design storm frequency (e.g., 100-year, 50-year, 10-year, etc.). The local agency determines the design storm frequency that must be used based on the type of project and specific local requirements. A discussion of design storm frequency is provided in Section 2.3 of this manual. A procedure has been developed that converts the 6-hour and 24-hour precipitation isopluvial map data to an Intensity-Duration curve that can be used for the rainfall intensity in the RM formula as shown in Figure 3-1. The RM is applicable to a 6-hour storm duration because the procedure uses Intensity-Duration Design Charts that are based on a 6-hour storm duration.

3.1.1 Rational Method Formula

The RM formula estimates the peak rate of runoff at any location in a watershed as a function of the drainage area (A), runoff coefficient (C), and rainfall intensity (I) for a duration equal to the time of concentration (T_c), which is the time required for water to

flow from the most remote point of the basin to the location being analyzed. The RM formula is expressed as follows:

$$Q = C\,I\,A$$

Where: Q = peak discharge, in cubic feet per second (cfs)

C = runoff coefficient, proportion of the rainfall that runs off the surface (no units)

I = average rainfall intensity for a duration equal to the T_c for the area, in inches per hour (Note: If the computed T_c is less than 5 minutes, use 5 minutes for computing the peak discharge, Q)

A = drainage area contributing to the design location, in acres

Combining the units for the expression CIA yields:

$$\left(\frac{1\,\text{acre} \times \text{inch}}{\text{hour}}\right)\left(\frac{43{,}560\,\text{ft}^2}{\text{acre}}\right)\left(\frac{1\,\text{foot}}{12\,\text{inches}}\right)\left(\frac{1\,\text{hour}}{3{,}600\,\text{seconds}}\right) \Rightarrow 1.008\,\text{cfs}$$

For practical purposes the unit conversion coefficient difference of 0.8% can be ignored.

The RM formula is based on the assumption that for constant rainfall intensity, the peak discharge rate at a point will occur when the raindrop that falls at the most upstream point in the tributary drainage basin arrives at the point of interest.

Unlike the MRM (discussed in Section 3.4) or the NRCS hydrologic method (discussed in Section 4), the RM does not create hydrographs and therefore does not add separate subarea hydrographs at collection points. Instead, the RM develops peak discharges in the main line by increasing the T_c as flow travels downstream.

Characteristics of, or assumptions inherent to, the RM are listed below:

- The discharge flow rate resulting from any I is maximum when the I lasts as long as or longer than the T_c.

- The storm frequency of peak discharges is the same as that of I for the given T_c.

- The fraction of rainfall that becomes runoff (or the runoff coefficient, C) is independent of I or precipitation zone number (PZN) condition (PZN Condition is discussed in Section 4.1.2.4).

- The peak rate of runoff is the only information produced by using the RM.

3.1.2 Runoff Coefficient

Table 3-1 lists the estimated runoff coefficients for urban areas. The concepts related to the runoff coefficient were evaluated in a report entitled *Evaluation, Rational Method "C" Values* (Hill, 2002) that was reviewed by the Hydrology Manual Committee. The Report is available at San Diego County Department of Public Works, Flood Control Section and on the San Diego County Department of Public Works web page.

The runoff coefficients are based on land use and soil type. Soil type can be determined from the soil type map provided in Appendix A. An appropriate runoff coefficient (C) for each type of land use in the subarea should be selected from this table and multiplied by the percentage of the total area (A) included in that class. The sum of the products for all land uses is the weighted runoff coefficient ($\Sigma[CA]$). Good engineering judgment should be used when applying the values presented in Table 3-1, as adjustments to these values may be appropriate based on site-specific characteristics. In any event, the impervious percentage (% Impervious) as given in the table, for any area, shall govern the selected value for C. The runoff coefficient can also be calculated for an area based on soil type and impervious percentage using the following formula:

$$C = 0.90 \times (\% \text{ Impervious}) + C_p \times (1 - \% \text{ Impervious})$$

Where: C_p = Pervious Coefficient Runoff Value for the soil type (shown in Table 3-1 as Undisturbed Natural Terrain/Permanent Open Space, 0% Impervious). Soil type can be determined from the soil type map provided in Appendix A.

The values in Table 3-1 are typical for most urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the local agency.

3.1.4 Time of Concentration

The Time of Concentration (T_c) is the time required for runoff to flow from the most remote part of the drainage area to the point of interest. The T_c is composed of two components: initial time of concentration (T_i) and travel time (T_t). Methods of computation for T_i and T_t are discussed below. The T_i is the time required for runoff to travel across the surface of the most remote subarea in the study, or "initial subarea." Guidelines for designating the initial subarea are provided within the discussion of computation of T_i. The T_t is the time required for the runoff to flow in a watercourse (e.g., swale, channel, gutter, pipe) or series of watercourses from the initial subarea to the point of interest. For the RM, the T_c at any point within the drainage area is given by:

$$T_c = T_i + T_t$$

Methods of calculation differ for natural watersheds (nonurbanized) and for urban drainage systems. When analyzing storm drain systems, the designer must consider the possibility that an existing natural watershed may become urbanized during the useful life of the storm drain system. Future land uses must be used for T_c and runoff calculations, and can be determined from the local Community General Plan.

3.1.4.1 Initial Time of Concentration

The initial time of concentration is typically based on sheet flow at the upstream end of a drainage basin. The Overland Time of Flow (Figure 3-3) is approximated by an equation developed by the Federal Aviation Agency (FAA) for analyzing flow on runaways (FAA, 1970). The usual runway configuration consists of a crown, like most freeways, with sloping pavement that directs flow to either side of the runway. This type of flow is uniform in the direction perpendicular to the velocity and is very shallow. Since these depths are ¼ of an inch (more or less) in magnitude, the relative roughness is high. Some higher relative roughness values for overland flow are presented in Table 3.5 of the *HEC-1 Flood Hydrograph Package User's Manual* (USACE, 1990).

In the hydrograph analysis, the post-development condition's Cn value is weighted based on the actual land use acreage:

	BASIN 100	BASIN 200	BASIN 300
DEV FOOT PRINT	353	80	80
UNDISTURBED	291	412	175
DEV C	90	90	90
PRE-C	82	82	82
WEIGHTED C	86.4	83.3	84.5

SUMMARY

PEAK DISCHARGE RATE (unmitigated)

DIS-CHARGE POINT	PRE-DEVELOPMENT CONDITIONS						DIS-CHARGE POINT	POST-DEVELOPMENT CONDITIONS						PROPOSED MITIGATION (for velocity only)
	C	Tc	I	A	V	Q		C	Tc	I	A	V	Q	
Node 150	0.36	34.18	2.67	617.5	2.93	530.84	Node 1131	0.36	21.48	3.6	598	2.4	933.0	Discharge into existing natural channel, no increase in velocity, no mitigation required
Node 2 23	0.30	25.47	3.23	520.30	15.2	526.19	Node 248	0.35	16.58	4.2	509.3	9.1	789.4	Discharge into existing natural channel, no increase in velocity, no mitigation required
Node 313	0.30	35.07	2.74	238.30	5.15	193.65	Node 327	0.30*	37.1	2.5	242.3	29.9	242.1	Riprap will be placed at discharge point

- From immediate upstream tributary area.

RUNOFF VOLUME

	BASIN 100	BASIN 200	BASIN 300
PRE-DEV (Ac-Ft)	320.2	267.3	123
POST-DEV(Ac-Ft)	345.3	249.4	132.9
REQUIRED DETENTION VOL(Ac-Ft)	25.1	-17.9	9.9

Riprap will be placed at all internal discharge points, downstream from proposed pipes and ditches, etc. the sizing of riprap will be determined during final engineering.

The proposed detention pond for each sub-basin is adequately size to store all the excessive runoff volume. Their outlet structures will restrict the peak runoff rate exiting these ponds at or below that of under the pre-development conditions. Based on the proposed mitigation facilities – detention ponds in the volume of 26.0Ac-ft, 2.77 Ac-ft (for hydromodification mitigation only), and 10.0Ac-ft for Sub-basins 100, 200 and 300, respectively. The proposed development will not adversely affect the downstream drainage facilities.

DECLARATION OF RESPONSIBLE CHARGE

I hereby declare that I am the civil Engineer of Work for this project, that I have exercised responsible charge over the design of this project as defined in Section 6703 of the Business and Professions code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

DAVID YEH, RCE 62717, EXP 6-30-14

100-YEAR HYDROLOGY CALCULATIONS

PRE-DEVELOPMENT CONDITIONS

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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 1503

                           Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* LILAC HILLS RANCH TM                                                    *
* PRELIMINARY HYDROLOGY ANAYSIS                                           *
* PRE-DEVELOPMENT CONDITIONS, 100-YEAR STORM                              *
 ***************************************************************************

  FILE NAME: 1037EX.DAT
  TIME/DATE OF STUDY: 09:50 02/17/2012
----------------------------------------------------------------------------
  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.*

+---------------------------------------------------------------------------+
|                                                                           |
|                                                                           |
|                                                                           |
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****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1042.00
  DOWNSTREAM ELEVATION(FEET) =   1038.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.482
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.690
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1038.00  DOWNSTREAM(FEET) =    826.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2700.00   CHANNEL SLOPE =  0.0785
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.488
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     43.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   9.79
  Tc(MIN.) =  15.27
  SUBAREA AREA(ACRES) =    57.80       SUBAREA RUNOFF(CFS) =   77.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     57.90         PEAK FLOW RATE(CFS) =      77.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   5.66
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =  2760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.27
  RAINFALL INTENSITY(INCH/HR) =   4.49
  TOTAL STREAM AREA(ACRES) =    57.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     77.98

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =    928.00
  DOWNSTREAM ELEVATION(FEET) =    927.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.702
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.450
  SUBAREA RUNOFF(CFS) =      0.23
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.23

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    927.00  DOWNSTREAM(FEET) =    826.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1200.00   CHANNEL SLOPE =  0.0842
  CHANNEL BASE(FEET) =   14.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.502
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.08
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   6.50
  Tc(MIN.) =  15.20
  SUBAREA AREA(ACRES) =    20.70       SUBAREA RUNOFF(CFS) =   27.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     20.80         PEAK FLOW RATE(CFS) =      28.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   3.87
  LONGEST FLOWPATH FROM NODE    104.00 TO NODE    103.00 =  1260.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.20
  RAINFALL INTENSITY(INCH/HR) =   4.50
  TOTAL STREAM AREA(ACRES) =    20.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       77.98    15.27        4.488         57.90
      2       28.12    15.20        4.502         20.80

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

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      105.74    15.20       4.502
      2      106.02    15.27       4.488

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    106.02   Tc(MIN.) =   15.27
  TOTAL AREA(ACRES) =     78.70
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =  2760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    826.00  DOWNSTREAM(FEET) =    794.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.00   CHANNEL SLOPE =  0.0410
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.017
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    113.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.54
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =  18.13
  SUBAREA AREA(ACRES) =    12.70       SUBAREA RUNOFF(CFS) =   15.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     91.40         PEAK FLOW RATE(CFS) =     110.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   4.48
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    106.00 =  3540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.13
  RAINFALL INTENSITY(INCH/HR) =   4.02
  TOTAL STREAM AREA(ACRES) =    91.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    110.20

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =    958.00
  DOWNSTREAM ELEVATION(FEET) =    956.00
```

```
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.467
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.120
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.00  DOWNSTREAM(FEET) =    794.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00   CHANNEL SLOPE =  0.1573
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.370
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.19
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   4.09
  Tc(MIN.) =  11.56
  SUBAREA AREA(ACRES) =     9.70       SUBAREA RUNOFF(CFS) =   15.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =      9.80         PEAK FLOW RATE(CFS) =      15.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   5.29
  LONGEST FLOWPATH FROM NODE    107.00 TO NODE    106.00 =  1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.56
  RAINFALL INTENSITY(INCH/HR) =   5.37
  TOTAL STREAM AREA(ACRES) =     9.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.79

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      110.20    18.13        4.017         91.40
      2       15.79    11.56        5.370          9.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       98.23    11.56       5.370
      2      122.01    18.13       4.017
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    122.01   Tc(MIN.) =   18.13
  TOTAL AREA(ACRES) =    101.20
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    106.00 =  3540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    794.00  DOWNSTREAM(FEET) =    786.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   144.00   CHANNEL SLOPE =  0.0556
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.968
  TURF FAIR COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  77
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    122.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.90
  AVERAGE FLOW DEPTH(FEET) =   1.98   TRAVEL TIME(MIN.) =   0.35
  Tc(MIN.) =  18.48
  SUBAREA AREA(ACRES) =     0.70       SUBAREA RUNOFF(CFS) =    0.83
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =    101.90         PEAK FLOW RATE(CFS) =     122.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    109.00 =  3684.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    989.00
  DOWNSTREAM ELEVATION(FEET) =    988.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.082
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    988.00  DOWNSTREAM(FEET) =    842.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1340.00   CHANNEL SLOPE =  0.1090
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.183
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   4.13
  Tc(MIN.) =  12.21
  SUBAREA AREA(ACRES) =    18.20       SUBAREA RUNOFF(CFS) =   33.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =     18.30         PEAK FLOW RATE(CFS) =      34.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =  1390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.21
  RAINFALL INTENSITY(INCH/HR) =   5.18
  TOTAL STREAM AREA(ACRES) =    18.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.12

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    978.00
  DOWNSTREAM ELEVATION(FEET) =    977.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    977.00  DOWNSTREAM(FEET) =    842.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.00   CHANNEL SLOPE =  0.0722
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.441
```

```
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.87
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   8.04
  Tc(MIN.) =  15.52
  SUBAREA AREA(ACRES) =    19.90       SUBAREA RUNOFF(CFS) =   31.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =     20.00         PEAK FLOW RATE(CFS) =      31.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   4.89
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    112.00 =  1920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.52
  RAINFALL INTENSITY(INCH/HR) =   4.44
  TOTAL STREAM AREA(ACRES) =    20.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.98

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       34.12    12.21        5.183         18.30
      2       31.98    15.52        4.441         20.00

  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       59.28    12.21       5.183
      2       61.21    15.52       4.441

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     61.21   Tc(MIN.) =   15.52
  TOTAL AREA(ACRES) =     38.30
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    112.00 =  1920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    842.00  DOWNSTREAM(FEET) =    786.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   875.00   CHANNEL SLOPE =  0.0640
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.200
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     68.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.37
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   1.41
  Tc(MIN.) =  16.93
  SUBAREA AREA(ACRES) =    10.10       SUBAREA RUNOFF(CFS) =   15.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =     48.40         PEAK FLOW RATE(CFS) =      73.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =  10.58
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    109.00 =  2795.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1       73.15    16.93       4.200       48.40
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    109.00 =  2795.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1      122.01    18.48       3.968      101.90
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    109.00 =  3684.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     184.91      16.93        4.200
      2     191.13      18.48        3.968

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    191.13   Tc(MIN.) =   18.48
  TOTAL AREA(ACRES) =    150.30

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    786.00  DOWNSTREAM(FEET) =    772.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   526.00   CHANNEL SLOPE =  0.0266
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.762
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    194.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.49
  AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   1.60
  Tc(MIN.) =  20.08
  SUBAREA AREA(ACRES) =     6.70       SUBAREA RUNOFF(CFS) =    7.56
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.319
  TOTAL AREA(ACRES) =    157.00         PEAK FLOW RATE(CFS) =     191.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.55   FLOW VELOCITY(FEET/SEC.) =   5.48
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    115.00 =  4210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  20.08
  RAINFALL INTENSITY(INCH/HR) =   3.76
  TOTAL STREAM AREA(ACRES) =   157.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    191.13

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    895.50
  DOWNSTREAM ELEVATION(FEET) =    894.00
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.060
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.382
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    894.00  DOWNSTREAM(FEET) =    772.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1120.00   CHANNEL SLOPE =  0.1089
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.152
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.54
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   5.27
```

```
  Tc(MIN.) =  12.33
  SUBAREA AREA(ACRES) =     9.10       SUBAREA RUNOFF(CFS) =   14.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =      9.20         PEAK FLOW RATE(CFS) =      14.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   4.44
  LONGEST FLOWPATH FROM NODE    116.00 TO NODE    115.00 =  1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.33
  RAINFALL INTENSITY(INCH/HR) =   5.15
  TOTAL STREAM AREA(ACRES) =     9.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.22

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      191.13    20.08        3.762        157.00
      2       14.22    12.33        5.152          9.20

  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      131.60    12.33       5.152
      2      201.52    20.08       3.762

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    201.52   Tc(MIN.) =   20.08
  TOTAL AREA(ACRES) =    166.20
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    115.00 =  4210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    772.00  DOWNSTREAM(FEET) =    636.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.00   CHANNEL SLOPE =  0.0692
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.269
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    221.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.71
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   4.88
  Tc(MIN.) =  24.96
```

```
  SUBAREA AREA(ACRES) =    40.10       SUBAREA RUNOFF(CFS) =   39.33
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.314
  TOTAL AREA(ACRES) =    206.30         PEAK FLOW RATE(CFS) =     211.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =   6.62
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    118.00 =  6176.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    120.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    935.50
  DOWNSTREAM ELEVATION(FEET) =    934.00
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.060
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.382
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    934.00  DOWNSTREAM(FEET) =    636.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2105.00   CHANNEL SLOPE =  0.1416
  CHANNEL BASE(FEET) =   14.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.449
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     19.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.17
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   8.42
  Tc(MIN.) =  15.48
  SUBAREA AREA(ACRES) =    26.90       SUBAREA RUNOFF(CFS) =   35.90
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     27.00         PEAK FLOW RATE(CFS) =      36.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   5.24
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    118.00 =  2155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =  10
----------------------------------------------------------------------------
```

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

******************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    937.00
  DOWNSTREAM ELEVATION(FEET) =    936.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.082
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.20

******************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    936.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1182.00   CHANNEL SLOPE =  0.1151
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.991
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.04
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   4.87
  Tc(MIN.) =  12.95
  SUBAREA AREA(ACRES) =    11.60       SUBAREA RUNOFF(CFS) =   20.84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.359
  TOTAL AREA(ACRES) =     11.70         PEAK FLOW RATE(CFS) =      20.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   5.41
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    123.00 =  1232.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.95
  RAINFALL INTENSITY(INCH/HR) =   4.99
  TOTAL STREAM AREA(ACRES) =    11.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.99

******************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    125.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1015.00
  DOWNSTREAM ELEVATION(FEET) =   1014.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.082
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    125.00 TO NODE    123.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1014.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2690.00   CHANNEL SLOPE =  0.0796
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.793
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     35.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.82
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =  11.74
  Tc(MIN.) =  19.82
  SUBAREA AREA(ACRES) =    49.80       SUBAREA RUNOFF(CFS) =   68.00
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =     49.90         PEAK FLOW RATE(CFS) =      68.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.75   FLOW VELOCITY(FEET/SEC.) =   4.64
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    123.00 =  2740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  19.82
  RAINFALL INTENSITY(INCH/HR) =   3.79
  TOTAL STREAM AREA(ACRES) =    49.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     68.11

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.99    12.95        4.991         11.70
      2       68.11    19.82        3.793         49.90
```

```
  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       65.50    12.95       4.991
      2       84.07    19.82       3.793

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     84.07   Tc(MIN.) =   19.82
  TOTAL AREA(ACRES) =     61.60
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    123.00 =  2740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    126.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    787.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   542.00   CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.554
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     86.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.29
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =  21.93
  SUBAREA AREA(ACRES) =     4.10       SUBAREA RUNOFF(CFS) =    4.37
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.356
  TOTAL AREA(ACRES) =     65.70         PEAK FLOW RATE(CFS) =      84.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =   4.26
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    126.00 =  3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    126.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  21.93
  RAINFALL INTENSITY(INCH/HR) =   3.55
  TOTAL STREAM AREA(ACRES) =    65.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     84.07

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    128.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    898.00
  DOWNSTREAM ELEVATION(FEET) =    896.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    126.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    896.00  DOWNSTREAM(FEET) =    787.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1470.00   CHANNEL SLOPE =  0.0741
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.208
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     13.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.34
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =  10.46
  Tc(MIN.) =  16.88
  SUBAREA AREA(ACRES) =    15.90       SUBAREA RUNOFF(CFS) =   24.08
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =     16.00         PEAK FLOW RATE(CFS) =      24.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   3.01
  LONGEST FLOWPATH FROM NODE    127.00 TO NODE    126.00 =  1520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    126.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.88
  RAINFALL INTENSITY(INCH/HR) =   4.21
  TOTAL STREAM AREA(ACRES) =    16.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.21

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       84.07    21.93        3.554         65.70
      2       24.21    16.88        4.208         16.00

  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       95.22    16.88       4.208
     2      104.52    21.93       3.554

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    104.52   Tc(MIN.) =   21.93
  TOTAL AREA(ACRES) =     81.70
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    126.00 =  3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    129.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    787.00  DOWNSTREAM(FEET) =    720.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.00   CHANNEL SLOPE =  0.0556
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.178
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    111.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.84
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =  26.07
  SUBAREA AREA(ACRES) =    13.80       SUBAREA RUNOFF(CFS) =   13.16
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.349
  TOTAL AREA(ACRES) =     95.50         PEAK FLOW RATE(CFS) =     105.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   4.75
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    129.00 =  4487.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    129.00 TO NODE    129.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  26.07
  RAINFALL INTENSITY(INCH/HR) =   3.18
  TOTAL STREAM AREA(ACRES) =    95.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    105.80

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    963.00
  DOWNSTREAM ELEVATION(FEET) =    962.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
```

```
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    129.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    962.00  DOWNSTREAM(FEET) =    720.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3400.00   CHANNEL SLOPE =  0.0712
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.416
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     32.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.58
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =  15.84
  Tc(MIN.) =  23.32
  SUBAREA AREA(ACRES) =    55.60       SUBAREA RUNOFF(CFS) =   56.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     55.70         PEAK FLOW RATE(CFS) =      57.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   4.36
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    129.00 =  3450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    129.00 TO NODE    129.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  23.32
  RAINFALL INTENSITY(INCH/HR) =   3.42
  TOTAL STREAM AREA(ACRES) =    55.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     57.10

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      105.80    26.07        3.178         95.50
      2       57.10    23.32        3.416         55.70

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      155.54    23.32       3.416
      2      158.93    26.07       3.178

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    158.93   Tc(MIN.) =   26.07
  TOTAL AREA(ACRES) =    151.20
```

```
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    129.00 =  4487.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    129.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    720.00  DOWNSTREAM(FEET) =    636.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   770.00   CHANNEL SLOPE =  0.1091
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.048
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    163.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.35
  AVERAGE FLOW DEPTH(FEET) =   1.17   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =  27.82
  SUBAREA AREA(ACRES) =    11.00       SUBAREA RUNOFF(CFS) =   10.06
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.329
  TOTAL AREA(ACRES) =    162.20         PEAK FLOW RATE(CFS) =     162.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   7.30
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    118.00 =  5257.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 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      162.48    27.82       3.048      162.20
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    118.00 =  5257.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1      211.84    24.96       3.269      206.30
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    118.00 =  6176.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     357.61      24.96        3.269
      2     360.00      27.82        3.048

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    360.00   Tc(MIN.) =   27.82
  TOTAL AREA(ACRES) =    368.50

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 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      360.00    27.82       3.048      368.50
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    118.00 =  6176.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1       36.03    15.48       4.449       27.00
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    118.00 =  2155.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     236.35      15.48        4.449
      2     384.69      27.82        3.048

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    384.69   Tc(MIN.) =   27.82
  TOTAL AREA(ACRES) =    395.50

******************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =  12
------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =  12
------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    132.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    636.00  DOWNSTREAM(FEET) =    616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.00   CHANNEL SLOPE =  0.0328
  CHANNEL BASE(FEET) =   26.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.940
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    394.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   1.60
  Tc(MIN.) =  29.42
  SUBAREA AREA(ACRES) =    22.40       SUBAREA RUNOFF(CFS) =   19.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.318
  TOTAL AREA(ACRES) =    417.90         PEAK FLOW RATE(CFS) =     390.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.99   FLOW VELOCITY(FEET/SEC.) =   6.35
```

```
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    132.00 =  6785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  29.42
  RAINFALL INTENSITY(INCH/HR) =   2.94
  TOTAL STREAM AREA(ACRES) =   417.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    390.85

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    834.00
  DOWNSTREAM ELEVATION(FEET) =    832.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    132.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.00  DOWNSTREAM(FEET) =    616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1340.00   CHANNEL SLOPE =  0.1612
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.475
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     13.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.23
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   5.29
  Tc(MIN.) =  11.22
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =   24.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     15.20         PEAK FLOW RATE(CFS) =      25.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   5.25
  LONGEST FLOWPATH FROM NODE    133.00 TO NODE    132.00 =  1390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.22
  RAINFALL INTENSITY(INCH/HR) =   5.48
  TOTAL STREAM AREA(ACRES) =    15.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.00

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      390.85    29.42        2.940        417.90
      2       25.00    11.22        5.475         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      174.06    11.22       5.475
      2      404.27    29.42       2.940

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    404.27   Tc(MIN.) =   29.42
  TOTAL AREA(ACRES) =    433.10
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    132.00 =  6785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    135.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    616.00  DOWNSTREAM(FEET) =    591.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   711.00   CHANNEL SLOPE =  0.0352
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.827
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    409.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.41
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =  31.26
  SUBAREA AREA(ACRES) =    12.20       SUBAREA RUNOFF(CFS) =   10.35
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.317
  TOTAL AREA(ACRES) =    445.30         PEAK FLOW RATE(CFS) =     404.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    135.00 =  7496.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```

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

******************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    137.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    898.50
  DOWNSTREAM ELEVATION(FEET) =    898.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.182
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.829
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.17

******************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    138.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    898.00  DOWNSTREAM(FEET) =    782.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1000.00   CHANNEL SLOPE =  0.1160
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.915
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.92
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   8.69
  Tc(MIN.) =  18.87
  SUBAREA AREA(ACRES) =     7.50       SUBAREA RUNOFF(CFS) =    8.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =      7.60         PEAK FLOW RATE(CFS) =       8.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   2.41
  LONGEST FLOWPATH FROM NODE    136.00 TO NODE    138.00 =  1050.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    138.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.87
  RAINFALL INTENSITY(INCH/HR) =   3.91
  TOTAL STREAM AREA(ACRES) =     7.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.93

******************************************************************************
  FLOW PROCESS FROM NODE    139.00 TO NODE    140.00 IS CODE =  21
------------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    992.00
  DOWNSTREAM ELEVATION(FEET) =    991.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.082
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.20

******************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    138.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    991.00  DOWNSTREAM(FEET) =    782.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1810.00   CHANNEL SLOPE =  0.1155
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.167
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.33
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   9.05
  Tc(MIN.) =  17.13
  SUBAREA AREA(ACRES) =    26.50       SUBAREA RUNOFF(CFS) =   33.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     26.60         PEAK FLOW RATE(CFS) =      33.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   4.22
  LONGEST FLOWPATH FROM NODE    139.00 TO NODE    138.00 =  1860.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    138.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  17.13
  RAINFALL INTENSITY(INCH/HR) =   4.17
  TOTAL STREAM AREA(ACRES) =    26.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.26

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.93    18.87        3.915          7.60
      2       33.26    17.13        4.167         26.60

  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       41.36    17.13       4.167
      2       40.17    18.87       3.915

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     41.36   Tc(MIN.) =   17.13
  TOTAL AREA(ACRES) =     34.20
  LONGEST FLOWPATH FROM NODE    139.00 TO NODE    138.00 =  1860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    141.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    782.00  DOWNSTREAM(FEET) =    634.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.00   CHANNEL SLOPE =  0.0831
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.394
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     58.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.62
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   6.42
  Tc(MIN.) =  23.55
  SUBAREA AREA(ACRES) =    34.20       SUBAREA RUNOFF(CFS) =   34.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     68.40         PEAK FLOW RATE(CFS) =      69.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   4.90
  LONGEST FLOWPATH FROM NODE    139.00 TO NODE    141.00 =  3641.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  23.55
  RAINFALL INTENSITY(INCH/HR) =   3.39
  TOTAL STREAM AREA(ACRES) =    68.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     69.64

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
```

```
  UPSTREAM ELEVATION(FEET) =    893.00
  DOWNSTREAM ELEVATION(FEET) =    891.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    143.00 TO NODE    141.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    891.00  DOWNSTREAM(FEET) =    634.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1940.00   CHANNEL SLOPE =  0.1325
  CHANNEL BASE(FEET) =   14.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.679
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     21.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.09
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   7.90
  Tc(MIN.) =  14.31
  SUBAREA AREA(ACRES) =    28.30       SUBAREA RUNOFF(CFS) =   39.73
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     28.40         PEAK FLOW RATE(CFS) =      39.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   5.15
  LONGEST FLOWPATH FROM NODE    142.00 TO NODE    141.00 =  1990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.31
  RAINFALL INTENSITY(INCH/HR) =   4.68
  TOTAL STREAM AREA(ACRES) =    28.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     39.87

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       69.64    23.55        3.394         68.40
      2       39.87    14.31        4.679         28.40

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       90.37    14.31       4.679
```

```
     2       98.55    23.55       3.394

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     98.55   Tc(MIN.) =   23.55
  TOTAL AREA(ACRES) =     96.80
  LONGEST FLOWPATH FROM NODE    139.00 TO NODE    141.00 =  3641.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    135.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    634.00  DOWNSTREAM(FEET) =    616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   668.00   CHANNEL SLOPE =  0.0269
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.141
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    104.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.71
  AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =  26.56
  SUBAREA AREA(ACRES) =    11.70       SUBAREA RUNOFF(CFS) =   11.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =    108.50         PEAK FLOW RATE(CFS) =     102.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   3.67
  LONGEST FLOWPATH FROM NODE    139.00 TO NODE    135.00 =  4309.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 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      102.23    26.56       3.141      108.50
  LONGEST FLOWPATH FROM NODE    139.00 TO NODE    135.00 =  4309.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
     1      404.27    31.26       2.827      445.30
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    135.00 =  7496.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     445.65      26.56        3.141
     2     496.29      31.26        2.827

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    496.29   Tc(MIN.) =   31.26
  TOTAL AREA(ACRES) =    553.80
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    144.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    616.00  DOWNSTREAM(FEET) =    518.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   941.00   CHANNEL SLOPE =  0.1041
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.750
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    502.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.39
  AVERAGE FLOW DEPTH(FEET) =   2.51   TRAVEL TIME(MIN.) =   1.38
  Tc(MIN.) =  32.64
  SUBAREA AREA(ACRES) =    14.20       SUBAREA RUNOFF(CFS) =   11.71
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.313
  TOTAL AREA(ACRES) =    568.00         PEAK FLOW RATE(CFS) =     496.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.50   FLOW VELOCITY(FEET/SEC.) =  11.36
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    144.00 =  8437.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    144.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  32.64
  RAINFALL INTENSITY(INCH/HR) =   2.75
  TOTAL STREAM AREA(ACRES) =   568.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    496.29

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    804.00
  DOWNSTREAM ELEVATION(FEET) =    803.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
```

```
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    144.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    803.00  DOWNSTREAM(FEET) =    518.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1400.00   CHANNEL SLOPE =  0.2036
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.031
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.39
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   5.32
  Tc(MIN.) =  12.79
  SUBAREA AREA(ACRES) =    12.70       SUBAREA RUNOFF(CFS) =   19.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     12.80         PEAK FLOW RATE(CFS) =      19.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   5.50
  LONGEST FLOWPATH FROM NODE    145.00 TO NODE    144.00 =  1450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    144.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.79
  RAINFALL INTENSITY(INCH/HR) =   5.03
  TOTAL STREAM AREA(ACRES) =    12.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.35

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      496.29    32.64        2.750        568.00
      2       19.35    12.79        5.031         12.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      213.85    12.79       5.031
      2      506.87    32.64       2.750

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    506.87   Tc(MIN.) =   32.64
  TOTAL AREA(ACRES) =    580.80
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    144.00 =  8437.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    147.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    518.00  DOWNSTREAM(FEET) =    505.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00   CHANNEL SLOPE =  0.0338
  CHANNEL BASE(FEET) =   17.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.698
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    509.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.65
  AVERAGE FLOW DEPTH(FEET) =   2.57   TRAVEL TIME(MIN.) =   0.96
  Tc(MIN.) =  33.61
  SUBAREA AREA(ACRES) =     6.30       SUBAREA RUNOFF(CFS) =    5.10
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.313
  TOTAL AREA(ACRES) =    587.10         PEAK FLOW RATE(CFS) =     506.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.56   FLOW VELOCITY(FEET/SEC.) =   6.65
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    147.00 =  8822.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    147.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  33.61
  RAINFALL INTENSITY(INCH/HR) =   2.70
  TOTAL STREAM AREA(ACRES) =   587.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    506.87

****************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    149.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    784.50
  DOWNSTREAM ELEVATION(FEET) =    784.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.419
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.129
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    147.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    784.00  DOWNSTREAM(FEET) =    505.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1735.00   CHANNEL SLOPE =  0.1608
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.317
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.25
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   6.80
  Tc(MIN.) =  16.22
  SUBAREA AREA(ACRES) =    13.80       SUBAREA RUNOFF(CFS) =   21.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =     13.90         PEAK FLOW RATE(CFS) =      21.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   5.43
  LONGEST FLOWPATH FROM NODE    148.00 TO NODE    147.00 =  1785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    147.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.22
  RAINFALL INTENSITY(INCH/HR) =   4.32
  TOTAL STREAM AREA(ACRES) =    13.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      506.87    33.61        2.698        587.10
      2       21.60    16.22        4.317         13.90

  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      338.46    16.22       4.317
      2      520.37    33.61       2.698

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    520.37   Tc(MIN.) =   33.61
  TOTAL AREA(ACRES) =    601.00
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    147.00 =  8822.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    150.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    505.00  DOWNSTREAM(FEET) =    486.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   251.00   CHANNEL SLOPE =  0.0757
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.669
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    522.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.26
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   0.58
  Tc(MIN.) =  34.18
  SUBAREA AREA(ACRES) =     5.60       SUBAREA RUNOFF(CFS) =    4.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.314
  TOTAL AREA(ACRES) =    606.60         PEAK FLOW RATE(CFS) =     520.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   7.27
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    150.00 =  9073.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  34.18
  RAINFALL INTENSITY(INCH/HR) =   2.67
  TOTAL STREAM AREA(ACRES) =   606.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    520.37

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    715.00
  DOWNSTREAM ELEVATION(FEET) =    714.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    150.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    714.00  DOWNSTREAM(FEET) =    486.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1371.00   CHANNEL SLOPE =  0.1663
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.489
RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  76
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.93
AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   7.79
Tc(MIN.) =  15.27
SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =   17.45
AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
TOTAL AREA(ACRES) =     10.90         PEAK FLOW RATE(CFS) =      17.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   3.69
LONGEST FLOWPATH FROM NODE    151.00 TO NODE    150.00 =  1421.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  15.27
RAINFALL INTENSITY(INCH/HR) =   4.49
TOTAL STREAM AREA(ACRES) =    10.90
PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.61

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      520.37    34.18        2.669        606.60
    2       17.61    15.27        4.489         10.90

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      327.01    15.27       4.489
    2      530.84    34.18       2.669

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    530.84   Tc(MIN.) =   34.18
TOTAL AREA(ACRES) =    617.50
LONGEST FLOWPATH FROM NODE    101.00 TO NODE    150.00 =  9073.00 FEET.

+--------------------------------------------------------------------------+
| RUNOFF EXITS WESTERLY PROJECT BOUNDARY                                   |
| END OF BASIN 100 ANALYSIS                                                |
|                                                                          |
+--------------------------------------------------------------------------+

+--------------------------------------------------------------------------+
|                                                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1071.00
  DOWNSTREAM ELEVATION(FEET) =   1070.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =    696.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4830.00   CHANNEL SLOPE =  0.0774
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.639
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     55.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.95
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =  27.30
  Tc(MIN.) =  34.78
  SUBAREA AREA(ACRES) =    99.90       SUBAREA RUNOFF(CFS) =   94.93
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =    100.00         PEAK FLOW RATE(CFS) =      95.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   3.64
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  4880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  34.78
  RAINFALL INTENSITY(INCH/HR) =   2.64
  TOTAL STREAM AREA(ACRES) =   100.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     95.02

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8100
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    944.50
  DOWNSTREAM ELEVATION(FEET) =    944.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.691
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.75

******************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    203.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.00  DOWNSTREAM(FEET) =    696.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4650.00   CHANNEL SLOPE =  0.0533
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.916
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    111.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.11
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =  15.17
  Tc(MIN.) =  18.86
  SUBAREA AREA(ACRES) =   147.00       SUBAREA RUNOFF(CFS) =  172.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =    147.10         PEAK FLOW RATE(CFS) =     173.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   5.92
  LONGEST FLOWPATH FROM NODE    204.00 TO NODE    203.00 =  4700.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.86
  RAINFALL INTENSITY(INCH/HR) =   3.92
  TOTAL STREAM AREA(ACRES) =   147.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    173.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       95.02    34.78        2.639        100.00
      2      173.01    18.86        3.916        147.10

  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      224.56    18.86       3.916
      2      211.63    34.78       2.639

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    224.56   Tc(MIN.) =   18.86
  TOTAL AREA(ACRES) =    247.10
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  4880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    696.00  DOWNSTREAM(FEET) =    644.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1029.00   CHANNEL SLOPE =  0.0505
  CHANNEL BASE(FEET) =   35.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.555
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    240.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =  21.91
  SUBAREA AREA(ACRES) =    30.70       SUBAREA RUNOFF(CFS) =   32.74
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.322
  TOTAL AREA(ACRES) =    277.80         PEAK FLOW RATE(CFS) =     317.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   6.21
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    206.00 =  5909.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    206.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    208.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    983.00
  DOWNSTREAM ELEVATION(FEET) =    982.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.082
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  SUBAREA RUNOFF(CFS) =      0.20
```

```
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    209.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    982.00  DOWNSTREAM(FEET) =    784.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2730.00   CHANNEL SLOPE =  0.0725
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.081
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     16.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.36
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =  19.28
  Tc(MIN.) =  27.36
  SUBAREA AREA(ACRES) =    31.40       SUBAREA RUNOFF(CFS) =   29.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     31.50         PEAK FLOW RATE(CFS) =      29.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   2.98
  LONGEST FLOWPATH FROM NODE    207.00 TO NODE    209.00 =  2780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    209.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  27.36
  RAINFALL INTENSITY(INCH/HR) =   3.08
  TOTAL STREAM AREA(ACRES) =    31.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.11

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1014.00
  DOWNSTREAM ELEVATION(FEET) =   1012.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    209.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1012.00  DOWNSTREAM(FEET) =    784.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2950.00   CHANNEL SLOPE =  0.0773
  CHANNEL BASE(FEET) =   28.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.684
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     34.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =  14.81
  Tc(MIN.) =  20.74
  SUBAREA AREA(ACRES) =    53.90       SUBAREA RUNOFF(CFS) =   59.57
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     54.00         PEAK FLOW RATE(CFS) =      59.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.04
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    209.00 =  3000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    209.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  20.74
  RAINFALL INTENSITY(INCH/HR) =   3.68
  TOTAL STREAM AREA(ACRES) =    54.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     59.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       29.11    27.36        3.081         31.50
      2       59.70    20.74        3.684         54.00

  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       81.77    20.74       3.684
      2       79.04    27.36       3.081

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     81.77   Tc(MIN.) =   20.74
  TOTAL AREA(ACRES) =     85.50
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    209.00 =  3000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    784.00  DOWNSTREAM(FEET) =    644.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2504.00   CHANNEL SLOPE =  0.0559
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.912
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    101.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.57
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   9.12
  Tc(MIN.) =  29.86
  SUBAREA AREA(ACRES) =    46.10       SUBAREA RUNOFF(CFS) =   40.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =    131.60         PEAK FLOW RATE(CFS) =     114.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   4.78
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    206.00 =  5504.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    206.00 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      114.98    29.86       2.912      131.60
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    206.00 =  5504.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF     Tc      INTENSITY     AREA
  NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
      1      317.82    21.91       3.555      277.80
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    206.00 =  5909.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     402.19      21.91        3.555
      2     375.29      29.86        2.912

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    402.19   Tc(MIN.) =   21.91
  TOTAL AREA(ACRES) =    409.40

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    206.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    644.00  DOWNSTREAM(FEET) =    584.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1033.00   CHANNEL SLOPE =  0.0581
  CHANNEL BASE(FEET) =   28.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.342
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    412.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.79
  AVERAGE FLOW DEPTH(FEET) =   1.69   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =  24.12
  SUBAREA AREA(ACRES) =    21.20       SUBAREA RUNOFF(CFS) =   21.25
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.314
  TOTAL AREA(ACRES) =    430.60         PEAK FLOW RATE(CFS) =     451.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =   8.04
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    212.00 =  6942.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  24.12
  RAINFALL INTENSITY(INCH/HR) =   3.34
  TOTAL STREAM AREA(ACRES) =   430.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    451.92

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    214.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    822.50
  DOWNSTREAM ELEVATION(FEET) =    822.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.182
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.829
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    822.00  DOWNSTREAM(FEET) =    644.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.00   CHANNEL SLOPE =  0.0948
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
```

```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.567
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     12.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.69
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =  11.62
  Tc(MIN.) =  21.81
  SUBAREA AREA(ACRES) =    21.00       SUBAREA RUNOFF(CFS) =   22.47
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     21.10         PEAK FLOW RATE(CFS) =      22.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.44
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    212.00 =  1927.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  21.81
  RAINFALL INTENSITY(INCH/HR) =   3.57
  TOTAL STREAM AREA(ACRES) =    21.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.58

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      451.92    24.12        3.342        430.60
      2       22.58    21.81        3.567         21.10

  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      431.09    21.81       3.567
      2      473.07    24.12       3.342

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    473.07   Tc(MIN.) =   24.12
  TOTAL AREA(ACRES) =    451.70
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    212.00 =  6942.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    215.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    644.00  DOWNSTREAM(FEET) =    533.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   470.00   CHANNEL SLOPE =  0.2362
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.293
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    475.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.22
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   0.55
  Tc(MIN.) =  24.67
  SUBAREA AREA(ACRES) =     5.70       SUBAREA RUNOFF(CFS) =    5.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.313
  TOTAL AREA(ACRES) =    457.40         PEAK FLOW RATE(CFS) =     473.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =  14.16
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    215.00 =  7412.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    215.00 TO NODE    215.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  24.67
  RAINFALL INTENSITY(INCH/HR) =   3.29
  TOTAL STREAM AREA(ACRES) =   457.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    473.07

****************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    217.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    859.00
  DOWNSTREAM ELEVATION(FEET) =    858.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.082
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.765
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    217.00 TO NODE    215.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    858.00  DOWNSTREAM(FEET) =    533.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.00   CHANNEL SLOPE =  0.1684
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.392
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     21.34
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.17
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   7.71
  Tc(MIN.) =  15.79
  SUBAREA AREA(ACRES) =    30.80       SUBAREA RUNOFF(CFS) =   40.58
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     30.90         PEAK FLOW RATE(CFS) =      40.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   5.28
  LONGEST FLOWPATH FROM NODE    216.00 TO NODE    215.00 =  1980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    215.00 TO NODE    215.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.79
  RAINFALL INTENSITY(INCH/HR) =   4.39
  TOTAL STREAM AREA(ACRES) =    30.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      473.07    24.67        3.293        457.40
      2       40.72    15.79        4.392         30.90

  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      395.44    15.79       4.392
      2      503.60    24.67       3.293

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    503.60   Tc(MIN.) =   24.67
  TOTAL AREA(ACRES) =    488.30
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    215.00 =  7412.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    215.00 TO NODE    218.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    533.00  DOWNSTREAM(FEET) =    482.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   370.00   CHANNEL SLOPE =  0.1378
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.249
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    506.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.79
```

```
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   0.52
  Tc(MIN.) =  25.20
  SUBAREA AREA(ACRES) =     5.00       SUBAREA RUNOFF(CFS) =    4.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.312
  TOTAL AREA(ACRES) =    493.30         PEAK FLOW RATE(CFS) =     503.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =  11.79
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    218.00 =  7782.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    218.00 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.) =  25.20
  RAINFALL INTENSITY(INCH/HR) =   3.25
  TOTAL STREAM AREA(ACRES) =   493.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    503.60

****************************************************************************
  FLOW PROCESS FROM NODE    219.00 TO NODE    220.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    752.00
  DOWNSTREAM ELEVATION(FEET) =    750.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    218.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =    482.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1340.00   CHANNEL SLOPE =  0.2000
  CHANNEL BASE(FEET) =   14.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.995
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.42
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   6.52
  Tc(MIN.) =  12.94
  SUBAREA AREA(ACRES) =    11.10       SUBAREA RUNOFF(CFS) =   16.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     11.20         PEAK FLOW RATE(CFS) =      16.78
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   4.33
  LONGEST FLOWPATH FROM NODE    219.00 TO NODE    218.00 =  1390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    218.00 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.) =  12.94
  RAINFALL INTENSITY(INCH/HR) =   4.99
  TOTAL STREAM AREA(ACRES) =    11.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.78

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8100
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    753.00
  DOWNSTREAM ELEVATION(FEET) =    751.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.325
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    218.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    751.00  DOWNSTREAM(FEET) =    533.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1189.00   CHANNEL SLOPE =  0.1833
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.646
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     16.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.55
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   6.68
  SUBAREA AREA(ACRES) =    11.70       SUBAREA RUNOFF(CFS) =   26.84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.304
  TOTAL AREA(ACRES) =     11.80         PEAK FLOW RATE(CFS) =      27.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   5.45
  LONGEST FLOWPATH FROM NODE    221.00 TO NODE    218.00 =  1239.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    218.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   6.68
  RAINFALL INTENSITY(INCH/HR) =   7.65
  TOTAL STREAM AREA(ACRES) =    11.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     27.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      503.60    25.20        3.249        493.30
      2       16.78    12.94        4.995         11.20
      3       27.46     6.68        7.646         11.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      250.12     6.68       7.646
      2      362.33    12.94       4.995
      3      526.19    25.20       3.249

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    526.19   Tc(MIN.) =   25.20
  TOTAL AREA(ACRES) =    516.30
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    218.00 =  7782.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    533.00  DOWNSTREAM(FEET) =    468.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   246.00   CHANNEL SLOPE =  0.2642
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.227
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    528.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.20
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   0.27
  Tc(MIN.) =  25.47
  SUBAREA AREA(ACRES) =     4.00       SUBAREA RUNOFF(CFS) =    3.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.312
  TOTAL AREA(ACRES) =    520.30         PEAK FLOW RATE(CFS) =     526.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.58   FLOW VELOCITY(FEET/SEC.) =  15.21
```

```
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    223.00 =  8028.00 FEET.

+----------------------------------------------------------------------------+
| RUNOFF EXITS WESTERLY PROJECT BOUNDARY                                     |
| END OF BASIN 200 ANALYSIS                                                  |
|                                                                            |
+----------------------------------------------------------------------------+

+----------------------------------------------------------------------------+
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1072.00
  DOWNSTREAM ELEVATION(FEET) =   1071.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1071.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3039.00   CHANNEL SLOPE =  0.0628
  CHANNEL BASE(FEET) =   38.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.477
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     53.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.33
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =  15.21
  Tc(MIN.) =  22.68
  SUBAREA AREA(ACRES) =    89.90       SUBAREA RUNOFF(CFS) =   93.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     90.00         PEAK FLOW RATE(CFS) =      93.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    303.00 =  3089.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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.) =  22.68
  RAINFALL INTENSITY(INCH/HR) =   3.48
  TOTAL STREAM AREA(ACRES) =    90.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     93.90

******************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1073.00
  DOWNSTREAM ELEVATION(FEET) =   1071.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

******************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    303.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1071.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1937.00   CHANNEL SLOPE =  0.0986
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.152
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     13.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.86
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =  11.30
  Tc(MIN.) =  17.23
  SUBAREA AREA(ACRES) =    19.10       SUBAREA RUNOFF(CFS) =   23.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     19.20         PEAK FLOW RATE(CFS) =      23.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.56
  LONGEST FLOWPATH FROM NODE    304.00 TO NODE    303.00 =  1987.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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.) =  17.23
```

```
  RAINFALL INTENSITY(INCH/HR) =   4.15
  TOTAL STREAM AREA(ACRES) =    19.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.94

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    307.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1016.00
  DOWNSTREAM ELEVATION(FEET) =   1014.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1014.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1283.00   CHANNEL SLOPE =  0.1044
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.384
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.19
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   5.10
  Tc(MIN.) =  11.52
  SUBAREA AREA(ACRES) =    20.20       SUBAREA RUNOFF(CFS) =   32.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     20.30         PEAK FLOW RATE(CFS) =      32.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   5.20
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    303.00 =  1333.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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.) =  11.52
  RAINFALL INTENSITY(INCH/HR) =   5.38
  TOTAL STREAM AREA(ACRES) =    20.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.79
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       93.90    22.68        3.477         90.00
      2       23.94    17.23        4.152         19.20
      3       32.79    11.52        5.384         20.30

  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       96.46    11.52       5.384
      2      120.54    17.23       4.152
      3      135.12    22.68       3.477

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    135.12   Tc(MIN.) =   22.68
  TOTAL AREA(ACRES) =    129.50
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    303.00 =  3089.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    880.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2084.00   CHANNEL SLOPE =  0.0288
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.748
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    151.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.48
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   9.99
  Tc(MIN.) =  32.68
  SUBAREA AREA(ACRES) =    32.80       SUBAREA RUNOFF(CFS) =   32.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.312
  TOTAL AREA(ACRES) =    162.30         PEAK FLOW RATE(CFS) =     139.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   3.37
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    308.00 =  5173.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 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.) =  32.68
  RAINFALL INTENSITY(INCH/HR) =   2.75
  TOTAL STREAM AREA(ACRES) =   162.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    139.22
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    309.00 TO NODE    310.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1026.00
  DOWNSTREAM ELEVATION(FEET) =   1025.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3025.00   CHANNEL SLOPE =  0.0678
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.733
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     36.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.92
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =  12.85
  Tc(MIN.) =  20.32
  SUBAREA AREA(ACRES) =    58.60       SUBAREA RUNOFF(CFS) =   65.62
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =     58.70         PEAK FLOW RATE(CFS) =      65.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   4.86
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    308.00 =  3075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 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.) =  20.32
  RAINFALL INTENSITY(INCH/HR) =   3.73
  TOTAL STREAM AREA(ACRES) =    58.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     65.75

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    931.00
  DOWNSTREAM ELEVATION(FEET) =    930.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    930.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   910.00   CHANNEL SLOPE =  0.1209
  CHANNEL BASE(FEET) =   28.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.090
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.98
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   5.09
  Tc(MIN.) =  12.56
  SUBAREA AREA(ACRES) =     7.20       SUBAREA RUNOFF(CFS) =   10.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.301
  TOTAL AREA(ACRES) =      7.30         PEAK FLOW RATE(CFS) =      11.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   3.81
  LONGEST FLOWPATH FROM NODE    311.00 TO NODE    308.00 =   960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 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.) =  12.56
  RAINFALL INTENSITY(INCH/HR) =   5.09
  TOTAL STREAM AREA(ACRES) =     7.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      139.22    32.68        2.748        162.30
      2       65.75    20.32        3.733         58.70
      3       11.18    12.56        5.090          7.30

  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      126.98    12.56       5.090
      2      176.43    20.32       3.733
      3      193.65    32.68       2.748

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    193.65   Tc(MIN.) =   32.68
  TOTAL AREA(ACRES) =    228.30
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    308.00 =  5173.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    313.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    820.00  DOWNSTREAM(FEET) =    786.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   740.00   CHANNEL SLOPE =  0.0459
  CHANNEL BASE(FEET) =   26.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.625
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    197.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =  35.07
  SUBAREA AREA(ACRES) =    10.20       SUBAREA RUNOFF(CFS) =    8.03
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.308
  TOTAL AREA(ACRES) =    238.50         PEAK FLOW RATE(CFS) =     193.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   5.12
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    313.00 =  5913.00 FEET.

+--------------------------------------------------------------------------+
| RUNOFF EXITS SOUTHWESTERLY CORNER OF PROJECT                             |
| END OF ANALYSIS                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    238.50  TC(MIN.) =     35.07
  PEAK FLOW RATE(CFS)   =    193.65
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

100-YEAR HYDROLOGY CALCULATIONS
POST-DEVELOPMENT CONDITIONS

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

             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 1503

                              Analysis prepared by:

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                               SAN DIEGO, CA 92121
                      TEL:  858-587-8070, FAX:  858-587-8750

 ************************** DESCRIPTION OF STUDY **************************
* LILAC HILLS RANCH TM                                                    *
* PRELIMINARY HYDROLOGY ANALYSIS                                          *
* POST-DEVELOPMENT CONDITIONS, 100-YEAR STORM                             *
 ***************************************************************************

  FILE NAME: 1037P.DAT
  TIME/DATE OF STUDY: 10:30 01/28/2013
----------------------------------------------------------------------------
  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    101.00 TO NODE    102.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    926.00
  DOWNSTREAM ELEVATION(FEET) =    925.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.128
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.337
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    925.50  DOWNSTREAM(FEET) =    864.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.00   CHANNEL SLOPE =  0.0370
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.517
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.00
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   11.09
  SUBAREA AREA(ACRES) =    24.90       SUBAREA RUNOFF(CFS) =   74.18
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       25.0         PEAK FLOW RATE(CFS) =      74.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   9.04
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =    1714.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    864.00  DOWNSTREAM(FEET) =    828.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   931.00   CHANNEL SLOPE =  0.0387
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.042
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  98
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.66
  Tc(MIN.) =   12.75
  SUBAREA AREA(ACRES) =     1.10       SUBAREA RUNOFF(CFS) =    4.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.554
```

```
  TOTAL AREA(ACRES) =       26.1         PEAK FLOW RATE(CFS) =      74.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   9.20
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    104.00 =    2645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    980.00
  DOWNSTREAM ELEVATION(FEET) =    970.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.727
  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) =      0.28
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    970.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00   CHANNEL SLOPE =  0.0467
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.972
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   8.30
  Tc(MIN.) =   13.03
  SUBAREA AREA(ACRES) =     4.90       SUBAREA RUNOFF(CFS) =    8.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.359
  TOTAL AREA(ACRES) =        5.0         PEAK FLOW RATE(CFS) =       8.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    107.00 =    1120.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    920.00  DOWNSTREAM(FEET) =    896.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.0558
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.388
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.57
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   2.78
  Tc(MIN.) =   15.81
  SUBAREA AREA(ACRES) =     5.60       SUBAREA RUNOFF(CFS) =    8.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.359
  TOTAL AREA(ACRES) =       10.6         PEAK FLOW RATE(CFS) =      16.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   2.77
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    108.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   893.00  DOWNSTREAM(FEET) =   892.00
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.84
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.72
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   15.84
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    109.00 =    1570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.84
  RAINFALL INTENSITY(INCH/HR) =   4.38
  TOTAL STREAM AREA(ACRES) =    10.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.72

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    926.00
  DOWNSTREAM ELEVATION(FEET) =    925.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.657
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.515
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.46

******************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    109.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    925.00  DOWNSTREAM(FEET) =    896.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   835.00   CHANNEL SLOPE =  0.0347
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.882
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.18
  AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =   4.38
  Tc(MIN.) =   10.04
  SUBAREA AREA(ACRES) =     3.40       SUBAREA RUNOFF(CFS) =   10.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =        3.5         PEAK FLOW RATE(CFS) =      11.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   4.13
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    109.00 =     885.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.04
  RAINFALL INTENSITY(INCH/HR) =   5.88
  TOTAL STREAM AREA(ACRES) =     3.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.72    15.84        4.384         10.60
      2       11.12    10.04        5.882          3.50
```

```
  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       21.72    10.04       5.882
      2       25.00    15.84       4.384

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      25.00   Tc(MIN.) =   15.84
  TOTAL AREA(ACRES) =       14.1
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    109.00 =    1570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    112.00 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) =   876.00
  FLOW LENGTH(FEET) =   282.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.10
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.00
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   16.13
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    112.00 =    1852.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =   16.13
  RAINFALL INTENSITY(INCH/HR) =   4.33
  TOTAL STREAM AREA(ACRES) =    14.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.00

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    990.00
  DOWNSTREAM ELEVATION(FEET) =    980.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.727
  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) =      0.28
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    980.00  DOWNSTREAM(FEET) =    910.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.00   CHANNEL SLOPE =  0.1014
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.231
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.58
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =    9.18
  SUBAREA AREA(ACRES) =     9.00       SUBAREA RUNOFF(CFS) =   20.19
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.359
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      20.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   3.31
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    115.00 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    112.00 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) =   876.00
  FLOW LENGTH(FEET) =   496.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.37
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    9.73
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    112.00 =    1236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =    9.73
  RAINFALL INTENSITY(INCH/HR) =   6.00
  TOTAL STREAM AREA(ACRES) =     9.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.37
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    918.00
  DOWNSTREAM ELEVATION(FEET) =    917.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.657
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.515
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    915.00  DOWNSTREAM(FEET) =    882.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   791.00   CHANNEL SLOPE =  0.0417
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.810
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   2.34
  Tc(MIN.) =    8.00
  SUBAREA AREA(ACRES) =    10.50       SUBAREA RUNOFF(CFS) =   38.62
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       10.6         PEAK FLOW RATE(CFS) =      38.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   7.37
  LONGEST FLOWPATH FROM NODE    116.00 TO NODE    112.00 =     841.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =    8.00
  RAINFALL INTENSITY(INCH/HR) =   6.81
  TOTAL STREAM AREA(ACRES) =    10.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.98

  ** CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       25.00    16.13        4.333         14.10
      2       20.37     9.73        6.002          9.10
      3       38.98     8.00        6.810         10.60

  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       71.64     8.00       6.810
      2       72.78     9.73       6.002
      3       64.51    16.13       4.333

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      72.78   Tc(MIN.) =    9.73
  TOTAL AREA(ACRES) =       33.8
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    112.00 =    1852.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    104.00 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) =   822.00
  FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.79
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      72.78
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   10.19
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    104.00 =    2512.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 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       72.78    10.19       5.825       33.80
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    104.00 =    2512.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       74.48    12.75       5.042       26.10
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    104.00 =    2645.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
```

```
     1     132.32      10.19        5.825
     2     137.47      12.75        5.042

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     137.47   Tc(MIN.) =   12.75
  TOTAL AREA(ACRES) =       59.9

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   822.00  DOWNSTREAM(FEET) =   818.00
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.48
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     137.47
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   12.86
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    118.00 =    2767.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.86
  RAINFALL INTENSITY(INCH/HR) =   5.02
  TOTAL STREAM AREA(ACRES) =    59.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    137.47

****************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    120.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    898.00
  DOWNSTREAM ELEVATION(FEET) =    897.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.657
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.515
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.46
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    896.00  DOWNSTREAM(FEET) =    824.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.00   CHANNEL SLOPE =  0.0656
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.875
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.22
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =    7.88
  SUBAREA AREA(ACRES) =    20.20       SUBAREA RUNOFF(CFS) =   75.00
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       20.3         PEAK FLOW RATE(CFS) =      75.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =  10.88
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    118.00 =    1148.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.88
  RAINFALL INTENSITY(INCH/HR) =   6.88
  TOTAL STREAM AREA(ACRES) =    20.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     75.37

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      137.47    12.86        5.015         59.90
      2       75.37     7.88        6.875         20.30

  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      159.66     7.88       6.875
      2      192.45    12.86       5.015

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     192.45   Tc(MIN.) =   12.86
  TOTAL AREA(ACRES) =       80.2
```

```
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    118.00 =    2767.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    121.00 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) =   810.00
  FLOW LENGTH(FEET) =  1100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  45.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.17
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     192.45
  PIPE TRAVEL TIME(MIN.) =   1.51    Tc(MIN.) =   14.36
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    121.00 =    3867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.36
  RAINFALL INTENSITY(INCH/HR) =   4.67
  TOTAL STREAM AREA(ACRES) =    80.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    192.45

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    40.00
  UPSTREAM ELEVATION(FEET) =    880.00
  DOWNSTREAM ELEVATION(FEET) =    860.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.691
  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) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    816.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   683.00   CHANNEL SLOPE =  0.0644
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
```

```
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.15
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.24
  Tc(MIN.) =    2.93
  SUBAREA AREA(ACRES) =     8.30       SUBAREA RUNOFF(CFS) =   59.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =        8.4         PEAK FLOW RATE(CFS) =      60.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =  11.28
  LONGEST FLOWPATH FROM NODE    122.00 TO NODE    121.00 =     723.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.93
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     8.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     60.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      192.45    14.36        4.669         80.20
      2       60.42     2.93        9.222          8.40

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      157.86     2.93       9.222
      2      223.04    14.36       4.669

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     223.04   Tc(MIN.) =   14.36
  TOTAL AREA(ACRES) =       88.6
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    121.00 =    3867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    124.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   806.00
  FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  46.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.13
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     223.04
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   15.00
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    124.00 =    4367.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    124.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.00
  RAINFALL INTENSITY(INCH/HR) =   4.54
  TOTAL STREAM AREA(ACRES) =    88.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    223.04

****************************************************************************
  FLOW PROCESS FROM NODE    125.00 TO NODE    126.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    860.00
  DOWNSTREAM ELEVATION(FEET) =    854.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.891
  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) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    124.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    854.00  DOWNSTREAM(FEET) =    812.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   603.00   CHANNEL SLOPE =  0.0697
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =    3.15
  SUBAREA AREA(ACRES) =     5.00       SUBAREA RUNOFF(CFS) =   35.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =        5.1         PEAK FLOW RATE(CFS) =      36.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   9.93
  LONGEST FLOWPATH FROM NODE    125.00 TO NODE    124.00 =     653.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    124.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =     5.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.68

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      223.04    15.00        4.541         88.60
      2       36.68     3.15        9.222          5.10

  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      146.51     3.15       9.222
      2      241.10    15.00       4.541

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     241.10   Tc(MIN.) =   15.00
  TOTAL AREA(ACRES) =       93.7
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    124.00 =    4367.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    127.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    129.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    930.00
  DOWNSTREAM ELEVATION(FEET) =    928.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    129.00 TO NODE    130.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    928.00  DOWNSTREAM(FEET) =    886.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.1050
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.098
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.25
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   1.57
  Tc(MIN.) =    7.50
  SUBAREA AREA(ACRES) =     5.00       SUBAREA RUNOFF(CFS) =   12.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =        5.1         PEAK FLOW RATE(CFS) =      13.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   5.43
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    130.00 =     450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   880.00  DOWNSTREAM(FEET) =   858.00
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.90
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.03
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.60
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    131.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    131.00 IS 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) =     5.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.03

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    916.00
  DOWNSTREAM ELEVATION(FEET) =    915.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.128
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.337
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    131.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.00  DOWNSTREAM(FEET) =    864.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1284.00   CHANNEL SLOPE =  0.0389
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.683
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   10.59
  SUBAREA AREA(ACRES) =    17.00       SUBAREA RUNOFF(CFS) =   52.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       17.1         PEAK FLOW RATE(CFS) =      52.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.27   FLOW VELOCITY(FEET/SEC.) =   8.01
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    131.00 =    1334.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    131.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   10.59
  RAINFALL INTENSITY(INCH/HR) =   5.68
  TOTAL STREAM AREA(ACRES) =    17.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.48

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.03     7.60        7.037          5.10
      2       52.48    10.59        5.683         17.10

  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       50.71     7.60       7.037
      2       63.01    10.59       5.683

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      63.01   Tc(MIN.) =   10.59
  TOTAL AREA(ACRES) =       22.2
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    131.00 =    1334.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    127.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   858.00  DOWNSTREAM(FEET) =   800.00
  FLOW LENGTH(FEET) =   750.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.67
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      63.01
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   11.14
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    127.00 =    2084.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    886.00
  DOWNSTREAM ELEVATION(FEET) =    882.00
```

```
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.564
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    136.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    882.00  DOWNSTREAM(FEET) =    856.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   808.00   CHANNEL SLOPE =  0.0322
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.030
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =    6.20
  SUBAREA AREA(ACRES) =     8.70       SUBAREA RUNOFF(CFS) =   37.72
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =        8.8         PEAK FLOW RATE(CFS) =      38.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   6.67
  LONGEST FLOWPATH FROM NODE    134.00 TO NODE    136.00 =     858.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    136.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.20
  RAINFALL INTENSITY(INCH/HR) =   8.03
  TOTAL STREAM AREA(ACRES) =     8.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.16

****************************************************************************
  FLOW PROCESS FROM NODE    136.10 TO NODE    136.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1015.00
  DOWNSTREAM ELEVATION(FEET) =   1014.00
  ELEVATION DIFFERENCE(FEET) =      1.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    136.20 TO NODE    136.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1014.00  DOWNSTREAM(FEET) =    862.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1683.00   CHANNEL SLOPE =  0.0903
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.144
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.86
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   9.80
  Tc(MIN.) =   17.28
  SUBAREA AREA(ACRES) =    36.50       SUBAREA RUNOFF(CFS) =   54.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =      54.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   3.64
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    136.30 =    1733.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    136.30 TO NODE    136.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   857.00  DOWNSTREAM(FEET) =   856.00
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.65
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      54.60
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   17.74
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    136.00 =    1943.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    136.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.74
  RAINFALL INTENSITY(INCH/HR) =   4.07
  TOTAL STREAM AREA(ACRES) =    36.60
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     54.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       38.16     6.20        8.030          8.80
      2       54.60    17.74        4.075         36.60

  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       57.23     6.20       8.030
      2       73.97    17.74       4.075

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      73.97   Tc(MIN.) =   17.74
  TOTAL AREA(ACRES) =       45.4
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    136.00 =    1943.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    137.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   850.00  DOWNSTREAM(FEET) =   848.00
  FLOW LENGTH(FEET) =   510.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.65
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.97
  PIPE TRAVEL TIME(MIN.) =   1.11    Tc(MIN.) =   18.85
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    137.00 =    2453.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    137.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.85
  RAINFALL INTENSITY(INCH/HR) =   3.92
  TOTAL STREAM AREA(ACRES) =    45.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     73.97

****************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    139.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    882.00
  DOWNSTREAM ELEVATION(FEET) =    880.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    139.00 TO NODE    137.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    880.00  DOWNSTREAM(FEET) =    854.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00   CHANNEL SLOPE =  0.0520
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.943
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =    6.30
  SUBAREA AREA(ACRES) =     4.60       SUBAREA RUNOFF(CFS) =   19.73
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      20.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   5.96
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    137.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    137.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.30
  RAINFALL INTENSITY(INCH/HR) =   7.94
  TOTAL STREAM AREA(ACRES) =     4.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.16

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       73.97    18.85        3.918         45.40
      2       20.16     6.30        7.943          4.70

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

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       56.65     6.30       7.943
      2       83.91    18.85       3.918

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      83.91   Tc(MIN.) =   18.85
  TOTAL AREA(ACRES) =       50.1
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    137.00 =    2453.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    140.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   848.00  DOWNSTREAM(FEET) =   845.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.19
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      83.91
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   19.29
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    140.00 =    2753.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.29
  RAINFALL INTENSITY(INCH/HR) =   3.86
  TOTAL STREAM AREA(ACRES) =    50.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     83.91

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    930.00
  DOWNSTREAM ELEVATION(FEET) =    928.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

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

```
  FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    928.00  DOWNSTREAM(FEET) =    906.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   592.00   CHANNEL SLOPE =  0.0372
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.343
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.29
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =    8.93
  SUBAREA AREA(ACRES) =     4.60       SUBAREA RUNOFF(CFS) =   10.50
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      10.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   4.28
  LONGEST FLOWPATH FROM NODE    141.00 TO NODE    143.00 =     642.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    143.00 TO NODE    140.00 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) =   845.00
  FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.95
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.73
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    9.40
  LONGEST FLOWPATH FROM NODE    141.00 TO NODE    140.00 =    1122.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.40
  RAINFALL INTENSITY(INCH/HR) =   6.14
  TOTAL STREAM AREA(ACRES) =     4.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.73

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

```
     1       83.91    19.29        3.860         50.10
     2       10.73     9.40        6.136          4.70

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       63.52     9.40       6.136
     2       90.66    19.29       3.860

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      90.66   Tc(MIN.) =   19.29
  TOTAL AREA(ACRES) =       54.8
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    140.00 =    2753.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    144.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   845.00  DOWNSTREAM(FEET) =   844.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.29
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      90.66
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   19.44
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    144.00 =    2853.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    144.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.44
  RAINFALL INTENSITY(INCH/HR) =   3.84
  TOTAL STREAM AREA(ACRES) =    54.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     90.66

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    926.00
  DOWNSTREAM ELEVATION(FEET) =    925.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.657
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.515
SUBAREA RUNOFF(CFS) =      0.46
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
FLOW PROCESS FROM NODE    146.00 TO NODE    144.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    924.00  DOWNSTREAM(FEET) =    886.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.0268
CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.842
RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  84
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.27
AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   4.49
Tc(MIN.) =   10.15
SUBAREA AREA(ACRES) =    14.20       SUBAREA RUNOFF(CFS) =   44.80
AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
TOTAL AREA(ACRES) =       14.3         PEAK FLOW RATE(CFS) =      45.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   6.70
LONGEST FLOWPATH FROM NODE    145.00 TO NODE    144.00 =    1470.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    144.00 TO NODE    144.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   10.15
RAINFALL INTENSITY(INCH/HR) =   5.84
TOTAL STREAM AREA(ACRES) =    14.30
PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.12

** CONFLUENCE DATA **
STREAM     RUNOFF       Tc      INTENSITY      AREA
NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1       90.66    19.44        3.841         54.80
    2       45.12    10.15        5.842         14.30

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      104.71    10.15       5.842
    2      120.32    19.44       3.841
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     120.32   Tc(MIN.) =   19.44
  TOTAL AREA(ACRES) =       69.1
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    144.00 =    2853.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    127.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   844.00  DOWNSTREAM(FEET) =   800.00
  FLOW LENGTH(FEET) =  1156.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.90
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     120.32
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =   20.41
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    127.00 =    4009.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    148.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    880.00
  DOWNSTREAM ELEVATION(FEET) =    876.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.037
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    127.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    876.00  DOWNSTREAM(FEET) =    806.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1277.00   CHANNEL SLOPE =  0.0548
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.60
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =    4.51
  SUBAREA AREA(ACRES) =    12.90       SUBAREA RUNOFF(CFS) =   92.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =       13.0         PEAK FLOW RATE(CFS) =      93.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =  11.09
  LONGEST FLOWPATH FROM NODE    147.00 TO NODE    127.00 =    1327.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 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       93.51     4.51       9.222       13.00
  LONGEST FLOWPATH FROM NODE    147.00 TO NODE    127.00 =    1327.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      241.10    15.00       4.541       93.70
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    127.00 =    4367.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     166.02       4.51        9.222
      2     287.15      15.00        4.541

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     287.15   Tc(MIN.) =   15.00
  TOTAL AREA(ACRES) =      106.7

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 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      287.15    15.00       4.541      106.70
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    127.00 =    4367.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       63.01    11.14       5.500       22.20
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    127.00 =    2084.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     276.31      11.14        5.500
      2     339.16      15.00        4.541

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     339.16   Tc(MIN.) =   15.00
  TOTAL AREA(ACRES) =      128.9

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 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      339.16    15.00       4.541      128.90
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    127.00 =    4367.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      120.32    20.41       3.722       69.10
  LONGEST FLOWPATH FROM NODE    136.10 TO NODE    127.00 =    4009.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     427.57      15.00        4.541
      2     398.34      20.41        3.722

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     427.57   Tc(MIN.) =   15.00
  TOTAL AREA(ACRES) =      198.0

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  12
----------------------------------------------------------------------------
```

```
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    149.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   800.00  DOWNSTREAM(FEET) =   790.00
  FLOW LENGTH(FEET) =   371.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  47.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.23
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     427.57
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   15.25
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    149.00 =    4738.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.25
  RAINFALL INTENSITY(INCH/HR) =   4.49
  TOTAL STREAM AREA(ACRES) =   198.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    427.57

******************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    846.00
  DOWNSTREAM ELEVATION(FEET) =    844.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.566
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

******************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    149.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    844.00  DOWNSTREAM(FEET) =    796.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   796.00   CHANNEL SLOPE =  0.0603
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
```

```
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.32
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =    4.38
  SUBAREA AREA(ACRES) =     8.20       SUBAREA RUNOFF(CFS) =   58.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      59.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   9.67
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    149.00 =     846.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.38
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     8.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     59.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      427.57    15.25        4.492        198.00
      2       59.70     4.38        9.222          8.30

  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      182.43     4.38       9.222
      2      456.64    15.25       4.492

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     456.64   Tc(MIN.) =   15.25
  TOTAL AREA(ACRES) =      206.3
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    149.00 =    4738.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   790.00  DOWNSTREAM(FEET) =   778.00
  FLOW LENGTH(FEET) =   432.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  50.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.69
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     456.64
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   15.54
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    152.00 =    5170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    886.00
  DOWNSTREAM ELEVATION(FEET) =    884.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    155.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    884.00  DOWNSTREAM(FEET) =    860.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.00   CHANNEL SLOPE =  0.0253
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.600
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.05
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =    8.40
  SUBAREA AREA(ACRES) =     6.50       SUBAREA RUNOFF(CFS) =   23.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =        6.6         PEAK FLOW RATE(CFS) =      23.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   5.18
```

```
  LONGEST FLOWPATH FROM NODE    153.00 TO NODE    155.00 =    1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    156.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   854.00  DOWNSTREAM(FEET) =   814.00
  FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.39
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.52
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    8.69
  LONGEST FLOWPATH FROM NODE    153.00 TO NODE    156.00 =    1360.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 IS 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) =   6.45
  TOTAL STREAM AREA(ACRES) =     6.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.52

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    158.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    874.00
  DOWNSTREAM ELEVATION(FEET) =    872.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    156.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    872.00  DOWNSTREAM(FEET) =    821.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1722.00   CHANNEL SLOPE =  0.0296
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.219
```

```
  OAK-ASPEN-MOUNTAIN BRUSH FAIR COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  57
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.66
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   6.15
  Tc(MIN.) =   12.09
  SUBAREA AREA(ACRES) =    19.40       SUBAREA RUNOFF(CFS) =   30.37
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       19.5         PEAK FLOW RATE(CFS) =      30.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   5.99
  LONGEST FLOWPATH FROM NODE    157.00 TO NODE    156.00 =    1772.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =    19.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.56

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       23.52     8.69        6.455          6.60
      2       30.56    12.09        5.219         19.50

  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       45.50     8.69       6.455
      2       49.58    12.09       5.219

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.58   Tc(MIN.) =   12.09
  TOTAL AREA(ACRES) =       26.1
  LONGEST FLOWPATH FROM NODE    157.00 TO NODE    156.00 =    1772.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   816.00  DOWNSTREAM(FEET) =   778.00
  FLOW LENGTH(FEET) =   153.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.7 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.58
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   12.17
  LONGEST FLOWPATH FROM NODE    157.00 TO NODE    152.00 =    1925.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 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       49.58    12.17       5.197       26.10
  LONGEST FLOWPATH FROM NODE    157.00 TO NODE    152.00 =    1925.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      456.64    15.54       4.437      206.30
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    152.00 =    5170.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     407.00      12.17        5.197
      2     498.97      15.54        4.437

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     498.97   Tc(MIN.) =   15.54
  TOTAL AREA(ACRES) =      232.4

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    159.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   778.00  DOWNSTREAM(FEET) =   768.00
  FLOW LENGTH(FEET) =   737.30   MANNING'S N =  0.013
  DEPTH OF FLOW IN  75.0 INCH PIPE IS  58.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.36
  ESTIMATED PIPE DIAMETER(INCH) =  75.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     498.97
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   16.18
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    159.00 =    5907.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    159.00 TO NODE    159.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.18
  RAINFALL INTENSITY(INCH/HR) =   4.32
  TOTAL STREAM AREA(ACRES) =   232.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    498.97

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    884.00
  DOWNSTREAM ELEVATION(FEET) =    882.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    162.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    882.00  DOWNSTREAM(FEET) =    822.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1740.00   CHANNEL SLOPE =  0.0345
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.770
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.95
  AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   5.85
  Tc(MIN.) =   10.34
  SUBAREA AREA(ACRES) =    10.00       SUBAREA RUNOFF(CFS) =   31.16
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       10.1         PEAK FLOW RATE(CFS) =      31.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   6.40
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    162.00 =    1790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    162.00 TO NODE    159.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   816.00  DOWNSTREAM(FEET) =   768.00
  FLOW LENGTH(FEET) =   277.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.82
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.47
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   10.52
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    159.00 =    2067.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    159.00 TO NODE    159.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.52
  RAINFALL INTENSITY(INCH/HR) =   5.71
  TOTAL STREAM AREA(ACRES) =    10.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      498.97    16.18        4.324        232.40
      2       31.47    10.52        5.706         10.10

  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      356.04    10.52       5.706
      2      522.82    16.18       4.324

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     522.82   Tc(MIN.) =   16.18
  TOTAL AREA(ACRES) =      242.5
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    159.00 =    5907.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    159.00 TO NODE    163.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   768.00  DOWNSTREAM(FEET) =   761.00
  FLOW LENGTH(FEET) =   611.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  78.0 INCH PIPE IS  62.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.29
  ESTIMATED PIPE DIAMETER(INCH) =  78.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     522.82
```

```
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   16.74
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    163.00 =    6518.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    163.00 TO NODE    163.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.74
  RAINFALL INTENSITY(INCH/HR) =   4.23
  TOTAL STREAM AREA(ACRES) =   242.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    522.82

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    165.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    884.00
  DOWNSTREAM ELEVATION(FEET) =    882.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    165.00 TO NODE    166.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    882.00  DOWNSTREAM(FEET) =    804.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.00   CHANNEL SLOPE =  0.0712
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.438
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.34
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =    6.98
  SUBAREA AREA(ACRES) =    12.70       SUBAREA RUNOFF(CFS) =   51.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       12.8         PEAK FLOW RATE(CFS) =      51.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   9.47
```

```
  LONGEST FLOWPATH FROM NODE    164.00 TO NODE    166.00 =    1145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    163.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   794.00  DOWNSTREAM(FEET) =   761.00
  FLOW LENGTH(FEET) =    86.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  39.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      51.41
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.01
  LONGEST FLOWPATH FROM NODE    164.00 TO NODE    163.00 =    1231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    163.00 TO NODE    163.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.01
  RAINFALL INTENSITY(INCH/HR) =   7.41
  TOTAL STREAM AREA(ACRES) =    12.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     51.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      522.82    16.74        4.231        242.50
      2       51.41     7.01        7.413         12.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      349.77     7.01       7.413
      2      552.16    16.74       4.231

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     552.16   Tc(MIN.) =   16.74
  TOTAL AREA(ACRES) =      255.3
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    163.00 =    6518.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    163.00 TO NODE    167.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   761.00  DOWNSTREAM(FEET) =   751.90
```

```
  FLOW LENGTH(FEET) =   913.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  84.0 INCH PIPE IS  63.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.82
  ESTIMATED PIPE DIAMETER(INCH) =  84.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     552.16
  PIPE TRAVEL TIME(MIN.) =   0.85    Tc(MIN.) =   17.59
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    167.00 =    7431.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    167.00 TO NODE    167.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.59
  RAINFALL INTENSITY(INCH/HR) =   4.10
  TOTAL STREAM AREA(ACRES) =   255.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    552.16

****************************************************************************
  FLOW PROCESS FROM NODE    168.00 TO NODE    169.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    836.00
  DOWNSTREAM ELEVATION(FEET) =    834.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.566
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE    169.00 TO NODE    167.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    834.00  DOWNSTREAM(FEET) =    790.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1250.00   CHANNEL SLOPE =  0.0352
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.12
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =    4.85
```

```
  SUBAREA AREA(ACRES) =    21.30       SUBAREA RUNOFF(CFS) =  153.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =       21.4         PEAK FLOW RATE(CFS) =     153.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =  11.86
  LONGEST FLOWPATH FROM NODE    168.00 TO NODE    167.00 =    1300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    167.00 TO NODE    167.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.85
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =    21.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    153.93

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      552.16    17.59        4.097        255.30
      2      153.93     4.85        9.222         21.40

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      399.24     4.85       9.222
      2      620.55    17.59       4.097

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     620.55   Tc(MIN.) =   17.59
  TOTAL AREA(ACRES) =      276.7
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    167.00 =    7431.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    167.00 TO NODE    170.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   784.00  DOWNSTREAM(FEET) =   738.00
  FLOW LENGTH(FEET) =   135.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  68.85
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     620.55
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   17.62
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    170.00 =    7566.30 FEET.

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

```
  FLOW PROCESS FROM NODE    170.00 TO NODE    171.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.00  DOWNSTREAM(FEET) =    736.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE =  0.0050
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.029
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     624.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.80
  AVERAGE FLOW DEPTH(FEET) =   2.21   TRAVEL TIME(MIN.) =   0.43
  Tc(MIN.) =   18.05
  SUBAREA AREA(ACRES) =     2.80       SUBAREA RUNOFF(CFS) =    8.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.533
  TOTAL AREA(ACRES) =      279.5         PEAK FLOW RATE(CFS) =     620.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.20   FLOW VELOCITY(FEET/SEC.) =  10.77
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    171.00 =    7846.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    171.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   730.00  DOWNSTREAM(FEET) =   702.00
  FLOW LENGTH(FEET) =   132.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  38.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  56.94
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     620.55
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   18.09
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    172.00 =    7978.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    173.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    702.00  DOWNSTREAM(FEET) =    696.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   381.00   CHANNEL SLOPE =  0.0157
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.951
  LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  74
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     622.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.31
  AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   0.52
```

```
  Tc(MIN.) =   18.61
  SUBAREA AREA(ACRES) =     4.00       SUBAREA RUNOFF(CFS) =    4.74
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.529
  TOTAL AREA(ACRES) =      283.5         PEAK FLOW RATE(CFS) =     620.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =  12.28
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    173.00 =    8359.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    173.00 TO NODE    174.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   690.00  DOWNSTREAM(FEET) =   658.00
  FLOW LENGTH(FEET) =   147.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  38.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  57.66
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     620.55
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   18.65
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    174.00 =    8506.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    174.00 TO NODE    175.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    658.00  DOWNSTREAM(FEET) =    644.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.0272
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.781
  LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  74
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     622.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.79
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   1.27
  Tc(MIN.) =   19.92
  SUBAREA AREA(ACRES) =     3.50       SUBAREA RUNOFF(CFS) =    3.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.527
  TOTAL AREA(ACRES) =      287.0         PEAK FLOW RATE(CFS) =     620.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.58   FLOW VELOCITY(FEET/SEC.) =   6.77
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    175.00 =    9021.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    175.00 TO NODE    176.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   638.00  DOWNSTREAM(FEET) =   612.00
```

```
  FLOW LENGTH(FEET) =   108.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  60.42
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     620.55
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   19.95
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    176.00 =    9129.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    176.00 TO NODE    176.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.95
  RAINFALL INTENSITY(INCH/HR) =   3.78
  TOTAL STREAM AREA(ACRES) =   287.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    620.55

****************************************************************************
  FLOW PROCESS FROM NODE    177.00 TO NODE    178.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    830.00
  DOWNSTREAM ELEVATION(FEET) =    828.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    178.00 TO NODE    179.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.00  DOWNSTREAM(FEET) =    714.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1062.00   CHANNEL SLOPE =  0.1073
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.42
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =  12.50
  Tc(MIN.) =   18.91
  SUBAREA AREA(ACRES) =     6.00       SUBAREA RUNOFF(CFS) =    7.04
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
```

```
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =       7.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   1.73
  LONGEST FLOWPATH FROM NODE    177.00 TO NODE    179.00 =    1112.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    179.00 TO NODE    180.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   708.00  DOWNSTREAM(FEET) =   660.00
  FLOW LENGTH(FEET) =   211.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.36
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.15
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   19.09
  LONGEST FLOWPATH FROM NODE    177.00 TO NODE    180.00 =    1323.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    180.00 TO NODE    176.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    660.00  DOWNSTREAM(FEET) =    612.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   303.00   CHANNEL SLOPE =  0.1584
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.666
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.80
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   20.90
  SUBAREA AREA(ACRES) =     1.60       SUBAREA RUNOFF(CFS) =    1.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        7.7         PEAK FLOW RATE(CFS) =       8.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   2.81
  LONGEST FLOWPATH FROM NODE    177.00 TO NODE    176.00 =    1626.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    176.00 TO NODE    176.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.90
```

```
  RAINFALL INTENSITY(INCH/HR) =   3.67
  TOTAL STREAM AREA(ACRES) =     7.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      620.55    19.95        3.778        287.00
      2        8.47    20.90        3.666          7.70

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      628.63    19.95       3.778
      2      610.61    20.90       3.666

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     628.63   Tc(MIN.) =   19.95
  TOTAL AREA(ACRES) =      294.7
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    176.00 =    9129.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    176.00 TO NODE    181.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    612.00  DOWNSTREAM(FEET) =    520.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   456.00   CHANNEL SLOPE =  0.2018
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     628.63
  FLOW VELOCITY(FEET/SEC.) =  14.09   FLOW DEPTH(FEET) =   1.64
  TRAVEL TIME(MIN.) =   0.54   Tc(MIN.) =   20.48
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    181.00 =    9585.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    181.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    182.00 TO NODE    183.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1042.00
  DOWNSTREAM ELEVATION(FEET) =   1038.00
  ELEVATION DIFFERENCE(FEET) =      4.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.482
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.690
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    183.00 TO NODE    184.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1038.00  DOWNSTREAM(FEET) =    840.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2464.00   CHANNEL SLOPE =  0.0804
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.216
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =  11.35
  Tc(MIN.) =   16.83
  SUBAREA AREA(ACRES) =    48.00       SUBAREA RUNOFF(CFS) =   60.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       48.1         PEAK FLOW RATE(CFS) =      60.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   4.50
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    184.00 =    2524.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    184.00 TO NODE    185.00 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) =   832.00
  FLOW LENGTH(FEET) =   152.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.19
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.86
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   16.96
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    185.00 =    2676.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    185.00 TO NODE    186.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   656.00   CHANNEL SLOPE =  0.0183
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.706
```

```
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.05
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   3.58
  Tc(MIN.) =   20.54
  SUBAREA AREA(ACRES) =     5.80       SUBAREA RUNOFF(CFS) =    6.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       53.9         PEAK FLOW RATE(CFS) =      60.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   2.98
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    186.00 =    3332.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    186.00 TO NODE    187.00 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) =   806.00
  FLOW LENGTH(FEET) =   121.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.00
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.86
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   20.62
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    187.00 =    3453.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    187.00 TO NODE    188.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    806.00  DOWNSTREAM(FEET) =    770.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   608.00   CHANNEL SLOPE =  0.0592
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.454
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.42
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   2.29
  Tc(MIN.) =   22.91
  SUBAREA AREA(ACRES) =     6.80       SUBAREA RUNOFF(CFS) =    7.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       60.7         PEAK FLOW RATE(CFS) =      62.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   4.41
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    188.00 =    4061.00 FEET.

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

```
  FLOW PROCESS FROM NODE    188.00 TO NODE    188.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.91
  RAINFALL INTENSITY(INCH/HR) =   3.45
  TOTAL STREAM AREA(ACRES) =    60.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     62.93

****************************************************************************
  FLOW PROCESS FROM NODE    189.00 TO NODE    190.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    924.00
  DOWNSTREAM ELEVATION(FEET) =    922.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    190.00 TO NODE    191.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    920.00  DOWNSTREAM(FEET) =    826.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1612.00   CHANNEL SLOPE =  0.0583
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.926
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =    7.79
  SUBAREA AREA(ACRES) =    20.50       SUBAREA RUNOFF(CFS) =   76.67
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       20.6         PEAK FLOW RATE(CFS) =      77.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOW VELOCITY(FEET/SEC.) =  10.55
  LONGEST FLOWPATH FROM NODE    189.00 TO NODE    191.00 =    1662.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    191.00 TO NODE    192.00 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) =   792.00
  FLOW LENGTH(FEET) =   184.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.24
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      77.04
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.89
  LONGEST FLOWPATH FROM NODE    189.00 TO NODE    192.00 =    1846.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    192.00 TO NODE    188.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    792.00  DOWNSTREAM(FEET) =    770.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   212.00   CHANNEL SLOPE =  0.1038
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.592
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.79
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   0.52
  Tc(MIN.) =    8.41
  SUBAREA AREA(ACRES) =     0.69       SUBAREA RUNOFF(CFS) =    1.36
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.532
  TOTAL AREA(ACRES) =       21.3         PEAK FLOW RATE(CFS) =      77.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   6.78
  LONGEST FLOWPATH FROM NODE    189.00 TO NODE    188.00 =    2058.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    188.00 TO NODE    188.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =    21.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     77.04

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       62.93    22.91        3.454         60.70
      2       77.04     8.41        6.592         21.29
```

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      100.15     8.41       6.592
      2      103.30    22.91       3.454

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     103.30   Tc(MIN.) =   22.91
  TOTAL AREA(ACRES) =       82.0
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    188.00 =    4061.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    188.00 TO NODE    193.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    770.00  DOWNSTREAM(FEET) =    730.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   845.00   CHANNEL SLOPE =  0.0473
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.149
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     108.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.99
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   3.53
  Tc(MIN.) =   26.45
  SUBAREA AREA(ACRES) =    11.70       SUBAREA RUNOFF(CFS) =   11.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.353
  TOTAL AREA(ACRES) =       93.7         PEAK FLOW RATE(CFS) =     104.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.92
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    193.00 =    4906.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    193.00 TO NODE    193.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.45
  RAINFALL INTENSITY(INCH/HR) =   3.15
  TOTAL STREAM AREA(ACRES) =    93.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    104.10

****************************************************************************
  FLOW PROCESS FROM NODE    194.00 TO NODE    195.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    816.00
  DOWNSTREAM ELEVATION(FEET) =    814.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.566
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

******************************************************************************
  FLOW PROCESS FROM NODE    195.00 TO NODE    196.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    814.00  DOWNSTREAM(FEET) =    806.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   495.00   CHANNEL SLOPE =  0.0162
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.44
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   1.86
  Tc(MIN.) =    4.43
  SUBAREA AREA(ACRES) =     5.70       SUBAREA RUNOFF(CFS) =   41.00
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =      41.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   5.70
  LONGEST FLOWPATH FROM NODE    194.00 TO NODE    196.00 =     545.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    196.00 TO NODE    193.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   800.00  DOWNSTREAM(FEET) =   730.00
  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  10.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  40.47
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.72
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    4.49
  LONGEST FLOWPATH FROM NODE    194.00 TO NODE    193.00 =     695.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    193.00 TO NODE    193.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.49
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     5.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      104.10    26.45        3.149         93.69
      2       41.72     4.49        9.222          5.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       77.27     4.49       9.222
      2      118.35    26.45       3.149

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     118.35   Tc(MIN.) =   26.45
  TOTAL AREA(ACRES) =       99.5
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    193.00 =    4906.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    193.00 TO NODE    197.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    730.00  DOWNSTREAM(FEET) =    640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1009.00   CHANNEL SLOPE =  0.0892
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.961
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =   29.09
  SUBAREA AREA(ACRES) =     7.70       SUBAREA RUNOFF(CFS) =    6.84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.372
  TOTAL AREA(ACRES) =      107.2         PEAK FLOW RATE(CFS) =     118.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   6.30
```

```
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    197.00 =    5915.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    197.00 TO NODE    197.00 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.) =   29.09
  RAINFALL INTENSITY(INCH/HR) =   2.96
  TOTAL STREAM AREA(ACRES) =   107.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    118.35

****************************************************************************
  FLOW PROCESS FROM NODE    198.00 TO NODE    199.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    878.00
  DOWNSTREAM ELEVATION(FEET) =    876.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    199.00 TO NODE   1100.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    876.00  DOWNSTREAM(FEET) =    772.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1442.00   CHANNEL SLOPE =  0.0721
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.438
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.44
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =  16.67
  Tc(MIN.) =   23.09
  SUBAREA AREA(ACRES) =    10.20       SUBAREA RUNOFF(CFS) =   10.52
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       10.3         PEAK FLOW RATE(CFS) =      10.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   1.80
  LONGEST FLOWPATH FROM NODE    198.00 TO NODE   1100.00 =    1492.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1111.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   772.00  DOWNSTREAM(FEET) =   754.00
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.62
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   23.36
  LONGEST FLOWPATH FROM NODE    198.00 TO NODE   1111.00 =    1732.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1111.00 TO NODE    197.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    754.00  DOWNSTREAM(FEET) =    640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1342.00   CHANNEL SLOPE =  0.0849
  CHANNEL BASE(FEET) =   45.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.684
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.13
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =  10.52
  Tc(MIN.) =   33.88
  SUBAREA AREA(ACRES) =    11.20       SUBAREA RUNOFF(CFS) =    9.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       21.5         PEAK FLOW RATE(CFS) =      17.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE    198.00 TO NODE    197.00 =    3074.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    197.00 TO NODE    197.00 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.) =   33.88
  RAINFALL INTENSITY(INCH/HR) =   2.68
  TOTAL STREAM AREA(ACRES) =    21.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.31

****************************************************************************
  FLOW PROCESS FROM NODE   1112.00 TO NODE   1113.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  74
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    920.00
  DOWNSTREAM ELEVATION(FEET) =    916.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.092
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.114
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.27

******************************************************************************
  FLOW PROCESS FROM NODE   1113.00 TO NODE    197.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    916.00  DOWNSTREAM(FEET) =    640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2247.00   CHANNEL SLOPE =  0.1228
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.540
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.78
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   9.91
  Tc(MIN.) =   15.00
  SUBAREA AREA(ACRES) =    25.00       SUBAREA RUNOFF(CFS) =   34.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       25.1         PEAK FLOW RATE(CFS) =      34.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   4.71
  LONGEST FLOWPATH FROM NODE   1112.00 TO NODE    197.00 =    2297.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    197.00 TO NODE    197.00 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.) =   15.00
  RAINFALL INTENSITY(INCH/HR) =   4.54
  TOTAL STREAM AREA(ACRES) =    25.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      118.35    29.09        2.961        107.19
```

```
     2       17.31    33.88        2.684         21.50
     3       34.18    15.00        4.540         25.10

  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      119.05    15.00       4.540
     2      155.51    29.09       2.961
     3      144.79    33.88       2.684

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     155.51   Tc(MIN.) =   29.09
  TOTAL AREA(ACRES) =      153.8
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    197.00 =    5915.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    197.00 TO NODE   1114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    640.00  DOWNSTREAM(FEET) =    616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   743.00   CHANNEL SLOPE =  0.0323
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.778
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     158.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.08
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   32.13
  SUBAREA AREA(ACRES) =     7.30       SUBAREA RUNOFF(CFS) =    6.08
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.348
  TOTAL AREA(ACRES) =      161.1         PEAK FLOW RATE(CFS) =     155.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   4.05
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE   1114.00 =    6658.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1114.00 TO NODE   1114.00 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.) =   32.13
  RAINFALL INTENSITY(INCH/HR) =   2.78
  TOTAL STREAM AREA(ACRES) =   161.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    155.73

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

```
  FLOW PROCESS FROM NODE   1115.00 TO NODE   1116.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    784.00
  DOWNSTREAM ELEVATION(FEET) =    780.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.564
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE   1116.00 TO NODE   1117.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    780.00  DOWNSTREAM(FEET) =    682.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1265.00   CHANNEL SLOPE =  0.0775
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.639
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.71
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =    5.53
  SUBAREA AREA(ACRES) =    26.60       SUBAREA RUNOFF(CFS) =  124.10
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       26.7         PEAK FLOW RATE(CFS) =     124.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =  13.85
  LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1117.00 =    1315.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1117.00 TO NODE   1118.00 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) =   666.00
  FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.46
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     124.56
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    5.57
  LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1118.00 =    1391.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1118.00 TO NODE   1114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    666.00  DOWNSTREAM(FEET) =    616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   419.00   CHANNEL SLOPE =  0.1193
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     124.56
  FLOW VELOCITY(FEET/SEC.) =   7.75   FLOW DEPTH(FEET) =   0.95
  TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =    6.47
  LONGEST FLOWPATH FROM NODE   1115.00 TO NODE   1114.00 =    1810.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1114.00 TO NODE   1114.00 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.) =    6.47
  RAINFALL INTENSITY(INCH/HR) =   7.81
  TOTAL STREAM AREA(ACRES) =    26.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    124.56

****************************************************************************
  FLOW PROCESS FROM NODE   1119.00 TO NODE   1120.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    832.00
  DOWNSTREAM ELEVATION(FEET) =    830.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE   1120.00 TO NODE   1114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    830.00  DOWNSTREAM(FEET) =    616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1345.00   CHANNEL SLOPE =  0.1591
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.299
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   5.39
  Tc(MIN.) =   11.80
  SUBAREA AREA(ACRES) =    14.90       SUBAREA RUNOFF(CFS) =   23.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       15.0         PEAK FLOW RATE(CFS) =      23.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   5.32
  LONGEST FLOWPATH FROM NODE   1119.00 TO NODE   1114.00 =    1395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1114.00 TO NODE   1114.00 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.) =   11.80
  RAINFALL INTENSITY(INCH/HR) =   5.30
  TOTAL STREAM AREA(ACRES) =    15.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.84

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      155.73    32.13        2.778        161.09
      2      124.56     6.47        7.807         26.70
      3       23.84    11.80        5.299         15.00

  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      193.05     6.47       7.807
      2      190.03    11.80       5.299
      3      212.55    32.13       2.778

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     212.55   Tc(MIN.) =   32.13
  TOTAL AREA(ACRES) =      202.8
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE   1114.00 =    6658.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1114.00 TO NODE   1121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    616.00  DOWNSTREAM(FEET) =    592.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   716.00   CHANNEL SLOPE =  0.0335
```

```
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.666
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     216.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =   34.23
  SUBAREA AREA(ACRES) =    11.00       SUBAREA RUNOFF(CFS) =    8.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.366
  TOTAL AREA(ACRES) =      213.8         PEAK FLOW RATE(CFS) =     212.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.62   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE   1121.00 =    7374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1121.00 TO NODE   1121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.23
  RAINFALL INTENSITY(INCH/HR) =   2.67
  TOTAL STREAM AREA(ACRES) =   213.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    212.55

****************************************************************************
  FLOW PROCESS FROM NODE   1122.00 TO NODE   1123.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    922.00
  DOWNSTREAM ELEVATION(FEET) =    920.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE   1123.00 TO NODE   1124.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    920.00  DOWNSTREAM(FEET) =    865.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1096.00   CHANNEL SLOPE =  0.0502
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.496
CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  71
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.91
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.07
AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   8.82
Tc(MIN.) =   15.23
SUBAREA AREA(ACRES) =    13.40       SUBAREA RUNOFF(CFS) =   18.07
AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
TOTAL AREA(ACRES) =       13.5         PEAK FLOW RATE(CFS) =      18.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   2.60
LONGEST FLOWPATH FROM NODE   1122.00 TO NODE   1124.00 =    1146.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1124.00 TO NODE   1125.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   865.00  DOWNSTREAM(FEET) =   808.00
FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  19.72
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      18.21
PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   15.64
LONGEST FLOWPATH FROM NODE   1122.00 TO NODE   1125.00 =    1626.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1125.00 TO NODE   1126.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    808.00  DOWNSTREAM(FEET) =    762.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1047.00   CHANNEL SLOPE =  0.0439
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.679
CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  71
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.39
AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   5.14
Tc(MIN.) =   20.78
SUBAREA AREA(ACRES) =     7.70       SUBAREA RUNOFF(CFS) =    8.50
AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
TOTAL AREA(ACRES) =       21.2         PEAK FLOW RATE(CFS) =      23.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   3.43
LONGEST FLOWPATH FROM NODE   1122.00 TO NODE   1126.00 =    2673.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1126.00 TO NODE   1127.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   762.00  DOWNSTREAM(FEET) =   746.00
  FLOW LENGTH(FEET) =   152.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.93
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.40
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   20.91
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE   1127.00 =    2825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1127.00 TO NODE   1121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    746.00  DOWNSTREAM(FEET) =    592.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.00   CHANNEL SLOPE =  0.0820
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.928
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.60
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   8.69
  Tc(MIN.) =   29.60
  SUBAREA AREA(ACRES) =    21.80       SUBAREA RUNOFF(CFS) =   19.15
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       43.0         PEAK FLOW RATE(CFS) =      37.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   3.79
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE   1121.00 =    4702.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1121.00 TO NODE   1121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.60
  RAINFALL INTENSITY(INCH/HR) =   2.93
  TOTAL STREAM AREA(ACRES) =    43.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.78

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      212.55    34.23        2.666        213.79
      2       37.78    29.60        2.928         43.00

  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      231.31    29.60       2.928
      2      246.95    34.23       2.666

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     246.95   Tc(MIN.) =   34.23
  TOTAL AREA(ACRES) =      256.8
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE   1121.00 =    7374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1121.00 TO NODE    181.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    592.00  DOWNSTREAM(FEET) =    520.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   970.00   CHANNEL SLOPE =  0.0742
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.569
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     250.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.96
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   36.26
  SUBAREA AREA(ACRES) =     9.90       SUBAREA RUNOFF(CFS) =    7.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.353
  TOTAL AREA(ACRES) =      266.7         PEAK FLOW RATE(CFS) =     246.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   7.90
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    181.00 =    8344.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    181.00 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      246.95    36.26       2.569      266.69
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    181.00 =    8344.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
```

```
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      628.63    20.48       3.713      294.70
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    181.00 =    9585.30 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     768.13      20.48        3.713
      2     681.88      36.26        2.569

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     768.13   Tc(MIN.) =   20.48
  TOTAL AREA(ACRES) =      561.4

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    181.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE   1128.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    520.00  DOWNSTREAM(FEET) =    504.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   396.00   CHANNEL SLOPE =  0.0404
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   6.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.632
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     771.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.23
  AVERAGE FLOW DEPTH(FEET) =   3.38   TRAVEL TIME(MIN.) =   0.72
  Tc(MIN.) =   21.20
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =    6.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.439
  TOTAL AREA(ACRES) =      567.8         PEAK FLOW RATE(CFS) =     906.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.69   FLOW VELOCITY(FEET/SEC.) =   9.68
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE   1128.00 =    9981.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1128.00 TO NODE   1128.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.20
  RAINFALL INTENSITY(INCH/HR) =   3.63
  TOTAL STREAM AREA(ACRES) =   567.79
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    906.20

****************************************************************************
  FLOW PROCESS FROM NODE   1129.00 TO NODE   1130.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    784.00
  DOWNSTREAM ELEVATION(FEET) =    782.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE   1130.00 TO NODE   1128.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    782.00  DOWNSTREAM(FEET) =    504.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1810.00   CHANNEL SLOPE =  0.1536
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.577
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.59
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   8.40
  Tc(MIN.) =   14.81
  SUBAREA AREA(ACRES) =    13.70       SUBAREA RUNOFF(CFS) =   18.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       13.8         PEAK FLOW RATE(CFS) =      18.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   4.54
  LONGEST FLOWPATH FROM NODE   1129.00 TO NODE   1128.00 =    1860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1128.00 TO NODE   1128.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.81
  RAINFALL INTENSITY(INCH/HR) =   4.58
  TOTAL STREAM AREA(ACRES) =    13.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.95
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      906.20    21.20        3.632        567.79
      2       18.95    14.81        4.577         13.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      652.07    14.81       4.577
      2      921.23    21.20       3.632

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     921.23   Tc(MIN.) =   21.20
  TOTAL AREA(ACRES) =      581.6
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE   1128.00 =    9981.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1128.00 TO NODE   1131.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    504.00  DOWNSTREAM(FEET) =    486.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   229.00   CHANNEL SLOPE =  0.0786
  CHANNEL BASE(FEET) =   61.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.586
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     924.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   0.42
  Tc(MIN.) =   21.62
  SUBAREA AREA(ACRES) =     5.50       SUBAREA RUNOFF(CFS) =    5.92
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.435
  TOTAL AREA(ACRES) =      587.1         PEAK FLOW RATE(CFS) =     921.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.58   FLOW VELOCITY(FEET/SEC.) =   9.06
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE   1131.00 =   10210.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1131.00 TO NODE   1131.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.62
  RAINFALL INTENSITY(INCH/HR) =   3.59
  TOTAL STREAM AREA(ACRES) =   587.09
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    921.23

****************************************************************************
  FLOW PROCESS FROM NODE   1132.00 TO NODE   1133.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    714.00
  DOWNSTREAM ELEVATION(FEET) =    712.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE   1133.00 TO NODE   1131.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    712.00  DOWNSTREAM(FEET) =    486.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1371.00   CHANNEL SLOPE =  0.1648
  CHANNEL BASE(FEET) =   26.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.372
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.41
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   9.49
  Tc(MIN.) =   15.90
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =   14.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       10.9         PEAK FLOW RATE(CFS) =      14.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   3.14
  LONGEST FLOWPATH FROM NODE   1132.00 TO NODE   1131.00 =    1421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1131.00 TO NODE   1131.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.90
  RAINFALL INTENSITY(INCH/HR) =   4.37
  TOTAL STREAM AREA(ACRES) =    10.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.30
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      921.23    21.62        3.586        587.09
      2       14.30    15.90        4.372         10.90

  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      769.96    15.90       4.372
      2      932.96    21.62       3.586

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     932.96   Tc(MIN.) =   21.62
  TOTAL AREA(ACRES) =      598.0
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE   1131.00 =   10210.30 FEET.

+----------------------------------------------------------------------------+
| FLOW EXITS WESTELRY PROJECT BOUNDARY                                       |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1014.00
  DOWNSTREAM ELEVATION(FEET) =   1010.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.092
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.114
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1010.00  DOWNSTREAM(FEET) =    856.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1488.00   CHANNEL SLOPE =  0.1035
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.505
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
```

```
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.46
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =  10.09
  Tc(MIN.) =   15.18
  SUBAREA AREA(ACRES) =    14.10       SUBAREA RUNOFF(CFS) =   19.06
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       14.2         PEAK FLOW RATE(CFS) =      19.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   3.12
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =    1538.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   856.00  DOWNSTREAM(FEET) =   850.00
  FLOW LENGTH(FEET) =   410.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.04
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.19
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   15.93
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    204.00 =    1948.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   202.00   CHANNEL SLOPE =  0.1485
  CHANNEL BASE(FEET) =    1.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.19
  FLOW VELOCITY(FEET/SEC.) =   6.37   FLOW DEPTH(FEET) =   1.00
  TRAVEL TIME(MIN.) =   0.53   Tc(MIN.) =   16.46
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    205.00 =    2150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    205.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.46
  RAINFALL INTENSITY(INCH/HR) =   4.28
  TOTAL STREAM AREA(ACRES) =    14.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.19

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    998.00
  DOWNSTREAM ELEVATION(FEET) =    996.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    996.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2010.00   CHANNEL SLOPE =  0.0876
  CHANNEL BASE(FEET) =   56.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.898
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.56
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =  13.07
  Tc(MIN.) =   19.00
  SUBAREA AREA(ACRES) =    44.90       SUBAREA RUNOFF(CFS) =   52.50
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       45.0         PEAK FLOW RATE(CFS) =      52.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   3.18
  LONGEST FLOWPATH FROM NODE    206.00 TO NODE    205.00 =    2060.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    205.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.00
  RAINFALL INTENSITY(INCH/HR) =   3.90
  TOTAL STREAM AREA(ACRES) =    45.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.64

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

```
     1       19.19    16.46        4.276         14.20
     2       52.64    19.00        3.898         45.00

  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       64.80    16.46       4.276
     2       70.14    19.00       3.898

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      70.14   Tc(MIN.) =   19.00
  TOTAL AREA(ACRES) =       59.2
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    205.00 =    2150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    208.00 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) =   806.00
  FLOW LENGTH(FEET) =   310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.90
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      70.14
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =   19.27
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    208.00 =    2460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.27
  RAINFALL INTENSITY(INCH/HR) =   3.86
  TOTAL STREAM AREA(ACRES) =    59.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     70.14

****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    210.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    866.00
  DOWNSTREAM ELEVATION(FEET) =    864.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
```

```
 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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    864.00  DOWNSTREAM(FEET) =    828.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.00   CHANNEL SLOPE =  0.0332
CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.960
RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  84
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.24
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.57
AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   3.24
Tc(MIN.) =    7.73
SUBAREA AREA(ACRES) =    11.80       SUBAREA RUNOFF(CFS) =   44.35
AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
TOTAL AREA(ACRES) =       11.9         PEAK FLOW RATE(CFS) =      44.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   7.19
LONGEST FLOWPATH FROM NODE    209.00 TO NODE    211.00 =    1134.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    211.00 TO NODE    208.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   822.00  DOWNSTREAM(FEET) =   806.00
FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  23.84
ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      44.73
PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.83
LONGEST FLOWPATH FROM NODE    209.00 TO NODE    208.00 =    1274.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =    7.83
RAINFALL INTENSITY(INCH/HR) =   6.90
TOTAL STREAM AREA(ACRES) =    11.90
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.73

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       70.14    19.27        3.862         59.20
      2       44.73     7.83        6.904         11.90

  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       83.96     7.83       6.904
      2       95.16    19.27       3.862

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      95.16   Tc(MIN.) =   19.27
  TOTAL AREA(ACRES) =       71.1
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    208.00 =    2460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    806.00  DOWNSTREAM(FEET) =    644.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2232.00   CHANNEL SLOPE =  0.0726
  CHANNEL BASE(FEET) =   45.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.065
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.48
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   8.31
  Tc(MIN.) =   27.59
  SUBAREA AREA(ACRES) =    45.00       SUBAREA RUNOFF(CFS) =   41.37
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.325
  TOTAL AREA(ACRES) =      116.1         PEAK FLOW RATE(CFS) =     115.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   4.46
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    212.00 =    4692.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    214.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    992.00
  DOWNSTREAM ELEVATION(FEET) =    990.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

******************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    215.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.00  DOWNSTREAM(FEET) =    832.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.00   CHANNEL SLOPE =  0.0778
  CHANNEL BASE(FEET) =   36.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.924
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.63
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =  12.87
  Tc(MIN.) =   18.81
  SUBAREA AREA(ACRES) =    34.10       SUBAREA RUNOFF(CFS) =   40.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       34.2         PEAK FLOW RATE(CFS) =      40.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   3.30
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    215.00 =    2082.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    215.00 TO NODE    216.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   832.00  DOWNSTREAM(FEET) =   798.00
  FLOW LENGTH(FEET) =  1144.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.14
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      40.28
  PIPE TRAVEL TIME(MIN.) =   1.35    Tc(MIN.) =   20.15
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    216.00 =    3226.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    216.00 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.) =   20.15
  RAINFALL INTENSITY(INCH/HR) =   3.75
  TOTAL STREAM AREA(ACRES) =    34.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.28

****************************************************************************
  FLOW PROCESS FROM NODE    217.00 TO NODE    218.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    872.00
  DOWNSTREAM ELEVATION(FEET) =    870.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.00  DOWNSTREAM(FEET) =    798.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1499.00   CHANNEL SLOPE =  0.0480
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.380
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.71
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =    7.06
  SUBAREA AREA(ACRES) =    35.00       SUBAREA RUNOFF(CFS) =  139.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       35.1         PEAK FLOW RATE(CFS) =     139.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =  12.57
  LONGEST FLOWPATH FROM NODE    217.00 TO NODE    216.00 =    1549.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    216.00 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.) =    7.06
  RAINFALL INTENSITY(INCH/HR) =   7.38
  TOTAL STREAM AREA(ACRES) =    35.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    139.87

******************************************************************************
  FLOW PROCESS FROM NODE    216.10 TO NODE    216.20 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    914.00
  DOWNSTREAM ELEVATION(FEET) =    912.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

******************************************************************************
  FLOW PROCESS FROM NODE    216.20 TO NODE    216.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    912.00  DOWNSTREAM(FEET) =    798.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.00   CHANNEL SLOPE =  0.0602
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.917
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.50
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =    7.81
  SUBAREA AREA(ACRES) =    29.50       SUBAREA RUNOFF(CFS) =  110.18
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       29.6         PEAK FLOW RATE(CFS) =     110.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =  12.29
  LONGEST FLOWPATH FROM NODE    216.10 TO NODE    216.00 =    1943.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    216.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.81
  RAINFALL INTENSITY(INCH/HR) =   6.92
  TOTAL STREAM AREA(ACRES) =    29.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    110.55

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       40.28    20.15        3.752         34.20
      2      139.87     7.06        7.380         35.10
      3      110.55     7.81        6.917         29.60

  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      253.98     7.06       7.380
      2      257.26     7.81       6.917
      3      171.39    20.15       3.752

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     257.26   Tc(MIN.) =    7.81
  TOTAL AREA(ACRES) =       98.9
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    216.00 =    3226.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    219.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   792.00  DOWNSTREAM(FEET) =   768.00
  FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.33
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     257.26
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    7.93
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    219.00 =    3481.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    219.00 TO NODE    219.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.93
  RAINFALL INTENSITY(INCH/HR) =   6.85
  TOTAL STREAM AREA(ACRES) =    98.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    257.26
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    921.00
  DOWNSTREAM ELEVATION(FEET) =    920.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    920.00  DOWNSTREAM(FEET) =    778.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2501.00   CHANNEL SLOPE =  0.0568
  CHANNEL BASE(FEET) =   48.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.195
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.27
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =  18.39
  Tc(MIN.) =   25.87
  SUBAREA AREA(ACRES) =    46.20       SUBAREA RUNOFF(CFS) =   44.28
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       46.3         PEAK FLOW RATE(CFS) =      44.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   2.76
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    222.00 =    2551.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    219.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   778.00  DOWNSTREAM(FEET) =   768.00
  FLOW LENGTH(FEET) =   192.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.66
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      44.39
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   26.05
```

```
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    219.00 =    2743.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    219.00 TO NODE    219.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.05
  RAINFALL INTENSITY(INCH/HR) =   3.18
  TOTAL STREAM AREA(ACRES) =    46.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      257.26     7.93        6.847         98.90
      2       44.39    26.05        3.180         46.30

  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      270.78     7.93       6.847
      2      163.89    26.05       3.180

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     270.78   Tc(MIN.) =    7.93
  TOTAL AREA(ACRES) =      145.2
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    219.00 =    3481.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    219.00 TO NODE    223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    768.00  DOWNSTREAM(FEET) =    696.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1523.00   CHANNEL SLOPE =  0.0473
  CHANNEL BASE(FEET) =   11.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.542
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     284.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   11.01
  SUBAREA AREA(ACRES) =    15.90       SUBAREA RUNOFF(CFS) =   26.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.396
  TOTAL AREA(ACRES) =      161.1         PEAK FLOW RATE(CFS) =     353.94
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =   8.82
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    223.00 =    5004.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    223.00 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.) =   11.01
  RAINFALL INTENSITY(INCH/HR) =   5.54
  TOTAL STREAM AREA(ACRES) =   161.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    353.94

****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    225.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    840.00
  DOWNSTREAM ELEVATION(FEET) =    838.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.566
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    226.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    838.00  DOWNSTREAM(FEET) =    760.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.00   CHANNEL SLOPE =  0.0660
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.39
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.35
  Tc(MIN.) =    4.91
  SUBAREA AREA(ACRES) =    10.40       SUBAREA RUNOFF(CFS) =   74.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =       10.5         PEAK FLOW RATE(CFS) =      75.52
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =  10.91
  LONGEST FLOWPATH FROM NODE    224.00 TO NODE    226.00 =    1231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    227.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   754.00  DOWNSTREAM(FEET) =   750.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.14
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      75.52
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    5.06
  LONGEST FLOWPATH FROM NODE    224.00 TO NODE    227.00 =    1371.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    227.00 TO NODE    223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =    696.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   726.00   CHANNEL SLOPE =  0.0744
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.118
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      79.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.01
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   2.41
  Tc(MIN.) =    7.47
  SUBAREA AREA(ACRES) =     3.30       SUBAREA RUNOFF(CFS) =    7.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.665
  TOTAL AREA(ACRES) =       13.8         PEAK FLOW RATE(CFS) =      75.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   4.95
  LONGEST FLOWPATH FROM NODE    224.00 TO NODE    223.00 =    2097.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    223.00 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.) =    7.47
  RAINFALL INTENSITY(INCH/HR) =   7.12
  TOTAL STREAM AREA(ACRES) =    13.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     75.52
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    228.00 TO NODE    229.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1076.00
  DOWNSTREAM ELEVATION(FEET) =   1074.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    229.00 TO NODE    230.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1074.00  DOWNSTREAM(FEET) =    858.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2289.00   CHANNEL SLOPE =  0.0944
  CHANNEL BASE(FEET) =   90.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.385
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =  17.71
  Tc(MIN.) =   23.65
  SUBAREA AREA(ACRES) =    48.70       SUBAREA RUNOFF(CFS) =   49.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       48.8         PEAK FLOW RATE(CFS) =      49.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   2.61
  LONGEST FLOWPATH FROM NODE    228.00 TO NODE    230.00 =    2339.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    231.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   858.00  DOWNSTREAM(FEET) =   828.00
  FLOW LENGTH(FEET) =  1014.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.49
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.58
  PIPE TRAVEL TIME(MIN.) =   1.17    Tc(MIN.) =   24.81
  LONGEST FLOWPATH FROM NODE    228.00 TO NODE    231.00 =    3353.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    231.00 TO NODE    223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.00  DOWNSTREAM(FEET) =    696.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1431.00   CHANNEL SLOPE =  0.0922
  CHANNEL BASE(FEET) =   44.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.836
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.79
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   6.29
  Tc(MIN.) =   31.11
  SUBAREA AREA(ACRES) =    31.70       SUBAREA RUNOFF(CFS) =   26.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       80.5         PEAK FLOW RATE(CFS) =      68.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   3.93
  LONGEST FLOWPATH FROM NODE    228.00 TO NODE    223.00 =    4784.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    223.00 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.) =   31.11
  RAINFALL INTENSITY(INCH/HR) =   2.84
  TOTAL STREAM AREA(ACRES) =    80.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     68.51

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      353.94    11.01        5.542        161.10
      2       75.52     7.47        7.118         13.80
      3       68.51    31.11        2.836         80.50

  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      367.53     7.47       7.118
      2      436.99    11.01       5.542
      3      279.76    31.11       2.836
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     436.99   Tc(MIN.) =   11.01
  TOTAL AREA(ACRES) =      255.4
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    223.00 =    5004.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    696.00  DOWNSTREAM(FEET) =    644.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1040.00   CHANNEL SLOPE =  0.0500
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.964
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     457.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.46
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   13.06
  SUBAREA AREA(ACRES) =    28.10       SUBAREA RUNOFF(CFS) =   41.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.373
  TOTAL AREA(ACRES) =      283.5         PEAK FLOW RATE(CFS) =     524.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.57   FLOW VELOCITY(FEET/SEC.) =   8.83
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    212.00 =    6044.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 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      524.41    13.06       4.964      283.50
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    212.00 =    6044.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      115.51    27.59       3.065      116.10
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    212.00 =    4692.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     579.09      13.06        4.964
      2     439.26      27.59        3.065

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     579.09   Tc(MIN.) =   13.06
```

```
  TOTAL AREA(ACRES) =      399.6

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    232.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    644.00  DOWNSTREAM(FEET) =    582.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1041.00   CHANNEL SLOPE =  0.0596
  CHANNEL BASE(FEET) =   27.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.542
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     593.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.98
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   14.99
  SUBAREA AREA(ACRES) =    21.30       SUBAREA RUNOFF(CFS) =   29.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.356
  TOTAL AREA(ACRES) =      420.9         PEAK FLOW RATE(CFS) =     679.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.29   FLOW VELOCITY(FEET/SEC.) =   9.39
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    232.00 =    7085.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    232.00 TO NODE    232.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.99
  RAINFALL INTENSITY(INCH/HR) =   4.54
  TOTAL STREAM AREA(ACRES) =   420.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    679.97

****************************************************************************
  FLOW PROCESS FROM NODE    233.00 TO NODE    234.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    820.00
  DOWNSTREAM ELEVATION(FEET) =    816.00
```

```
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.710
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    234.00 TO NODE    232.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.00  DOWNSTREAM(FEET) =    582.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.00   CHANNEL SLOPE =  0.1212
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.272
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.73
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =  11.77
  Tc(MIN.) =   16.48
  SUBAREA AREA(ACRES) =    17.10       SUBAREA RUNOFF(CFS) =   21.92
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =      22.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   3.40
  LONGEST FLOWPATH FROM NODE    233.00 TO NODE    232.00 =    1981.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    232.00 TO NODE    232.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.48
  RAINFALL INTENSITY(INCH/HR) =   4.27
  TOTAL STREAM AREA(ACRES) =    17.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.07

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      679.97    14.99        4.542        420.90
      2       22.07    16.48        4.272         17.20

  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      700.04    14.99       4.542
      2      661.72    16.48       4.272

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     700.04   Tc(MIN.) =   14.99
  TOTAL AREA(ACRES) =      438.1
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    232.00 =    7085.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    232.00 TO NODE    235.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    582.00  DOWNSTREAM(FEET) =    534.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   474.00   CHANNEL SLOPE =  0.1013
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.423
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     703.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.59
  AVERAGE FLOW DEPTH(FEET) =   2.63   TRAVEL TIME(MIN.) =   0.63
  Tc(MIN.) =   15.62
  SUBAREA AREA(ACRES) =     5.60       SUBAREA RUNOFF(CFS) =    7.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.353
  TOTAL AREA(ACRES) =      443.7         PEAK FLOW RATE(CFS) =     700.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.62   FLOW VELOCITY(FEET/SEC.) =  12.57
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    235.00 =    7559.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    235.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.62
  RAINFALL INTENSITY(INCH/HR) =   4.42
  TOTAL STREAM AREA(ACRES) =   443.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    700.04

****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    237.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    858.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    854.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.092
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.114
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE    237.00 TO NODE    235.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    854.00  DOWNSTREAM(FEET) =    534.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1938.00   CHANNEL SLOPE =  0.1651
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.243
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.68
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   6.91
  Tc(MIN.) =   12.00
  SUBAREA AREA(ACRES) =    30.60       SUBAREA RUNOFF(CFS) =   48.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       30.7         PEAK FLOW RATE(CFS) =      48.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =   5.89
  LONGEST FLOWPATH FROM NODE    236.00 TO NODE    235.00 =    1988.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    235.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.00
  RAINFALL INTENSITY(INCH/HR) =   5.24
  TOTAL STREAM AREA(ACRES) =    30.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     48.29

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      700.04    15.62        4.423        443.70
      2       48.29    12.00        5.243         30.70

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

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

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      638.86    12.00       5.243
      2      740.78    15.62       4.423

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     740.78   Tc(MIN.) =   15.62
  TOTAL AREA(ACRES) =      474.4
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    235.00 =    7559.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    238.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    534.00  DOWNSTREAM(FEET) =    526.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   125.00   CHANNEL SLOPE =  0.0640
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.388
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     741.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.69
  AVERAGE FLOW DEPTH(FEET) =   2.91   TRAVEL TIME(MIN.) =   0.19
  Tc(MIN.) =   15.81
  SUBAREA AREA(ACRES) =     0.60       SUBAREA RUNOFF(CFS) =    0.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.349
  TOTAL AREA(ACRES) =      475.0         PEAK FLOW RATE(CFS) =     740.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.90   FLOW VELOCITY(FEET/SEC.) =  10.71
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    238.00 =    7684.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    238.00 TO NODE    238.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.81
  RAINFALL INTENSITY(INCH/HR) =   4.39
  TOTAL STREAM AREA(ACRES) =   475.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    740.78

****************************************************************************
  FLOW PROCESS FROM NODE    239.00 TO NODE    240.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    748.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    740.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.851
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    98.00
           (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) =      3.60
  TOTAL AREA(ACRES) =      0.50   TOTAL RUNOFF(CFS) =      3.60

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   407.00   CHANNEL SLOPE =  0.0983
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  93
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.07
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   0.96
  Tc(MIN.) =    3.81
  SUBAREA AREA(ACRES) =     4.20       SUBAREA RUNOFF(CFS) =   30.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      33.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   8.89
  LONGEST FLOWPATH FROM NODE    239.00 TO NODE    241.00 =     507.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    241.00 TO NODE    242.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   694.00  DOWNSTREAM(FEET) =   690.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.62
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.81
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    3.85
  LONGEST FLOWPATH FROM NODE    239.00 TO NODE    242.00 =     557.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    242.00 TO NODE    238.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    690.00  DOWNSTREAM(FEET) =    526.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   993.00   CHANNEL SLOPE =  0.1652
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.202
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.75
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =    7.33
  SUBAREA AREA(ACRES) =     3.00       SUBAREA RUNOFF(CFS) =    6.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.593
  TOTAL AREA(ACRES) =        7.7         PEAK FLOW RATE(CFS) =      33.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   4.62
  LONGEST FLOWPATH FROM NODE    239.00 TO NODE    238.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    238.00 TO NODE    238.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.33
  RAINFALL INTENSITY(INCH/HR) =   7.20
  TOTAL STREAM AREA(ACRES) =     7.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.81

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      740.78    15.81        4.388        475.00
      2       33.81     7.33        7.202          7.70

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      485.11     7.33       7.202
      2      761.37    15.81       4.388

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     761.37   Tc(MIN.) =   15.81
  TOTAL AREA(ACRES) =      482.7
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    238.00 =    7684.00 FEET.

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

```
  FLOW PROCESS FROM NODE    238.00 TO NODE    243.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    526.00  DOWNSTREAM(FEET) =    482.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   262.00   CHANNEL SLOPE =  0.1679
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.334
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     762.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.15
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   0.31
  Tc(MIN.) =   16.12
  SUBAREA AREA(ACRES) =     1.10       SUBAREA RUNOFF(CFS) =    1.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.353
  TOTAL AREA(ACRES) =      483.8         PEAK FLOW RATE(CFS) =     761.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =  14.18
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    243.00 =    7946.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    243.00 TO NODE    243.00 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.) =   16.12
  RAINFALL INTENSITY(INCH/HR) =   4.33
  TOTAL STREAM AREA(ACRES) =   483.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    761.37

****************************************************************************
  FLOW PROCESS FROM NODE    244.00 TO NODE    245.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    708.00
  DOWNSTREAM ELEVATION(FEET) =    700.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.727
  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) =      0.28
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.28

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

```
  FLOW PROCESS FROM NODE    245.00 TO NODE    243.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    482.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.00   CHANNEL SLOPE =  0.1886
  CHANNEL BASE(FEET) =   36.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.907
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.25
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   8.57
  Tc(MIN.) =   13.30
  SUBAREA AREA(ACRES) =     9.30       SUBAREA RUNOFF(CFS) =   13.69
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        9.4         PEAK FLOW RATE(CFS) =      13.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   2.84
  LONGEST FLOWPATH FROM NODE    244.00 TO NODE    243.00 =    1206.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    243.00 TO NODE    243.00 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.) =   13.30
  RAINFALL INTENSITY(INCH/HR) =   4.91
  TOTAL STREAM AREA(ACRES) =     9.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.84

****************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    247.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    746.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.564
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    247.00 TO NODE    243.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    746.00  DOWNSTREAM(FEET) =    482.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1189.00   CHANNEL SLOPE =  0.2220
  CHANNEL BASE(FEET) =   42.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.490
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.60
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   7.61
  Tc(MIN.) =   11.17
  SUBAREA AREA(ACRES) =    12.00       SUBAREA RUNOFF(CFS) =   19.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.302
  TOTAL AREA(ACRES) =       12.1         PEAK FLOW RATE(CFS) =      20.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   3.21
  LONGEST FLOWPATH FROM NODE    246.00 TO NODE    243.00 =    1239.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    243.00 TO NODE    243.00 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.) =   11.17
  RAINFALL INTENSITY(INCH/HR) =   5.49
  TOTAL STREAM AREA(ACRES) =    12.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      761.37    16.12        4.334        483.80
      2       13.84    13.30        4.907          9.40
      3       20.06    11.17        5.490         12.10

  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      632.64    11.17       5.490
      2      704.18    13.30       4.907
      3      789.43    16.12       4.334

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     789.43   Tc(MIN.) =   16.12
  TOTAL AREA(ACRES) =      505.3
```

```
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    243.00 =    7946.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    243.00 TO NODE    248.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    482.00  DOWNSTREAM(FEET) =    470.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.0480
  CHANNEL BASE(FEET) =   28.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.256
  CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  71
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     791.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.13
  AVERAGE FLOW DEPTH(FEET) =   2.61   TRAVEL TIME(MIN.) =   0.46
  Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =     4.00       SUBAREA RUNOFF(CFS) =    5.11
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.351
  TOTAL AREA(ACRES) =      509.3         PEAK FLOW RATE(CFS) =     789.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.60   FLOW VELOCITY(FEET/SEC.) =   9.13
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    248.00 =    8196.00 FEET.

+--------------------------------------------------------------------------+
| FLOW EXITS WESTERLY PROJECT BOUNDARY                                     |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1072.00
  DOWNSTREAM ELEVATION(FEET) =   1071.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.476
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1071.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3039.00   CHANNEL SLOPE =  0.0628
  CHANNEL BASE(FEET) =   38.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.477
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.33
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =  15.21
  Tc(MIN.) =   22.68
  SUBAREA AREA(ACRES) =    89.90       SUBAREA RUNOFF(CFS) =   93.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       90.0         PEAK FLOW RATE(CFS) =      93.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    303.00 =    3089.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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.) =   22.68
  RAINFALL INTENSITY(INCH/HR) =   3.48
  TOTAL STREAM AREA(ACRES) =    90.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     93.90

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1073.00
  DOWNSTREAM ELEVATION(FEET) =   1071.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1071.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1937.00   CHANNEL SLOPE =  0.0986
```

```
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.152
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.86
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =  11.30
  Tc(MIN.) =   17.23
  SUBAREA AREA(ACRES) =    19.10       SUBAREA RUNOFF(CFS) =   23.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =       19.2         PEAK FLOW RATE(CFS) =      23.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.56
  LONGEST FLOWPATH FROM NODE    304.00 TO NODE    303.00 =    1987.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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.) =   17.23
  RAINFALL INTENSITY(INCH/HR) =   4.15
  TOTAL STREAM AREA(ACRES) =    19.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.94

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    307.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1016.00
  DOWNSTREAM ELEVATION(FEET) =   1014.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1014.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1283.00   CHANNEL SLOPE =  0.1044
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.384
LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  81
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.09
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.19
AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   5.10
Tc(MIN.) =   11.52
SUBAREA AREA(ACRES) =    20.20       SUBAREA RUNOFF(CFS) =   32.63
AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
TOTAL AREA(ACRES) =       20.3         PEAK FLOW RATE(CFS) =      32.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   5.20
LONGEST FLOWPATH FROM NODE    306.00 TO NODE    303.00 =    1333.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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.) =   11.52
RAINFALL INTENSITY(INCH/HR) =   5.38
TOTAL STREAM AREA(ACRES) =    20.30
PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.79

** CONFLUENCE DATA **
STREAM     RUNOFF       Tc      INTENSITY      AREA
NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1       93.90    22.68        3.477         90.00
    2       23.94    17.23        4.152         19.20
    3       32.79    11.52        5.384         20.30

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       96.46    11.52       5.384
    2      120.54    17.23       4.152
    3      135.12    22.68       3.477

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =     135.12   Tc(MIN.) =   22.68
TOTAL AREA(ACRES) =      129.5
LONGEST FLOWPATH FROM NODE    301.00 TO NODE    303.00 =    3089.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    303.00 TO NODE    308.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    880.00  DOWNSTREAM(FEET) =    872.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE =  0.0286
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.345
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     135.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.33
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   1.40
  Tc(MIN.) =   24.09
  SUBAREA AREA(ACRES) =     1.10       SUBAREA RUNOFF(CFS) =    1.10
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =      130.6         PEAK FLOW RATE(CFS) =     135.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   3.31
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    308.00 =    3369.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    309.00 TO NODE    310.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =   1024.00
  DOWNSTREAM ELEVATION(FEET) =   1022.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    311.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.00  DOWNSTREAM(FEET) =    912.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   916.00   CHANNEL SLOPE =  0.1201
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.512
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.95
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   5.17
  Tc(MIN.) =   11.10
  SUBAREA AREA(ACRES) =    11.50       SUBAREA RUNOFF(CFS) =   19.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.301
  TOTAL AREA(ACRES) =       11.6         PEAK FLOW RATE(CFS) =      19.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOW VELOCITY(FEET/SEC.) =   3.76
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    311.00 =     966.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   912.00  DOWNSTREAM(FEET) =   897.00
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.64
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.22
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   11.20
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    312.00 =    1082.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    312.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.20
  RAINFALL INTENSITY(INCH/HR) =   5.48
  TOTAL STREAM AREA(ACRES) =    11.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.22

****************************************************************************
  FLOW PROCESS FROM NODE    313.00 TO NODE    314.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    944.00
  DOWNSTREAM ELEVATION(FEET) =    942.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.257
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.30
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    315.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    942.00  DOWNSTREAM(FEET) =    908.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   312.00   CHANNEL SLOPE =  0.1090
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.701
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.29
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =    8.20
  SUBAREA AREA(ACRES) =     4.40       SUBAREA RUNOFF(CFS) =    8.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.301
  TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =       9.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   2.84
  LONGEST FLOWPATH FROM NODE    313.00 TO NODE    315.00 =     362.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    315.00 TO NODE    312.00 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) =   897.00
  FLOW LENGTH(FEET) =   152.00   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.) =  13.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.09
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    8.39
  LONGEST FLOWPATH FROM NODE    313.00 TO NODE    312.00 =     514.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    312.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.39
  RAINFALL INTENSITY(INCH/HR) =   6.61
  TOTAL STREAM AREA(ACRES) =     4.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.09

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       19.22    11.20        5.482         11.60
      2        9.09     8.39        6.605          4.50

  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       23.48     8.39       6.605
      2       26.76    11.20       5.482

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.76   Tc(MIN.) =   11.20
  TOTAL AREA(ACRES) =       16.1
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    312.00 =    1082.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    316.00 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) =   893.00
  FLOW LENGTH(FEET) =   526.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.66
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.76
  PIPE TRAVEL TIME(MIN.) =   1.14    Tc(MIN.) =   12.34
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    316.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    316.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.34
  RAINFALL INTENSITY(INCH/HR) =   5.15
  TOTAL STREAM AREA(ACRES) =    16.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.76

****************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    318.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    984.00
  DOWNSTREAM ELEVATION(FEET) =    982.00
  ELEVATION DIFFERENCE(FEET) =      2.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.415
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.853
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    318.00 TO NODE    319.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    982.00  DOWNSTREAM(FEET) =    936.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   383.00   CHANNEL SLOPE =  0.1201
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.939
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.84
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =    9.89
  SUBAREA AREA(ACRES) =     2.20       SUBAREA RUNOFF(CFS) =    3.92
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       4.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   2.28
  LONGEST FLOWPATH FROM NODE    317.00 TO NODE    319.00 =     433.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    319.00 TO NODE    316.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   936.00  DOWNSTREAM(FEET) =   893.00
  FLOW LENGTH(FEET) =   132.00   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.) =  18.70
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.10
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   10.01
  LONGEST FLOWPATH FROM NODE    317.00 TO NODE    316.00 =     565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    316.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.01
  RAINFALL INTENSITY(INCH/HR) =   5.89
```

```
  TOTAL STREAM AREA(ACRES) =     2.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.10

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.76    12.34        5.149         16.10
      2        4.10    10.01        5.894          2.30

  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       27.47    10.01       5.894
      2       30.34    12.34       5.149

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.34   Tc(MIN.) =   12.34
  TOTAL AREA(ACRES) =       18.4
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    316.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    308.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   893.00  DOWNSTREAM(FEET) =   872.00
  FLOW LENGTH(FEET) =   520.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.87
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.34
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   12.92
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    308.00 =    2128.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 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       30.34    12.92       4.998       18.40
  LONGEST FLOWPATH FROM NODE    309.00 TO NODE    308.00 =    2128.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      135.12    24.09       3.345      130.60
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    308.00 =    3369.00 FEET.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     102.84      12.92        4.998
      2     155.42      24.09        3.345

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     155.42   Tc(MIN.) =   24.09
  TOTAL AREA(ACRES) =      149.0

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    320.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    872.00  DOWNSTREAM(FEET) =    846.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1088.00   CHANNEL SLOPE =  0.0239
  CHANNEL BASE(FEET) =   72.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.895
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.00
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   6.04
  Tc(MIN.) =   30.13
  SUBAREA AREA(ACRES) =    22.60       SUBAREA RUNOFF(CFS) =   19.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =      171.6         PEAK FLOW RATE(CFS) =     155.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   2.92
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    320.00 =    4457.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    321.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   846.00  DOWNSTREAM(FEET) =   845.00
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.46
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     155.42
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   30.16
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    321.00 =    4497.00 FEET.

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

```
  FLOW PROCESS FROM NODE    321.00 TO NODE    322.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    845.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   556.00   CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =   90.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.721
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     157.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.08
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   33.17
  SUBAREA AREA(ACRES) =     5.60       SUBAREA RUNOFF(CFS) =    4.57
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =      177.2         PEAK FLOW RATE(CFS) =     155.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   3.08
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    322.00 =    5053.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    322.00 TO NODE    322.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.17
  RAINFALL INTENSITY(INCH/HR) =   2.72
  TOTAL STREAM AREA(ACRES) =   177.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    155.42

****************************************************************************
  FLOW PROCESS FROM NODE    323.00 TO NODE    324.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    906.00
  DOWNSTREAM ELEVATION(FEET) =    904.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    324.00 TO NODE    325.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    904.00  DOWNSTREAM(FEET) =    856.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1547.00   CHANNEL SLOPE =  0.0310
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.938
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.85
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =    7.77
  SUBAREA AREA(ACRES) =    31.00       SUBAREA RUNOFF(CFS) =  116.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       31.1         PEAK FLOW RATE(CFS) =     116.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =  10.30
  LONGEST FLOWPATH FROM NODE    323.00 TO NODE    325.00 =    1597.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    325.00 TO NODE    326.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   850.00  DOWNSTREAM(FEET) =   848.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.68
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     116.51
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    7.79
  LONGEST FLOWPATH FROM NODE    323.00 TO NODE    326.00 =    1627.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    326.00 TO NODE    322.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    848.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   659.00   CHANNEL SLOPE =  0.0349
  CHANNEL BASE(FEET) =   16.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.861
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     120.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.77
  AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   2.30
  Tc(MIN.) =   10.10
```

```
  SUBAREA AREA(ACRES) =     4.10       SUBAREA RUNOFF(CFS) =    7.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.512
  TOTAL AREA(ACRES) =       35.2         PEAK FLOW RATE(CFS) =     116.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   4.73
  LONGEST FLOWPATH FROM NODE    323.00 TO NODE    322.00 =    2286.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    322.00 TO NODE    322.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =    35.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    116.51

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      155.42    33.17        2.721        177.20
      2      116.51    10.10        5.861         35.20

  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      163.81    10.10       5.861
      2      209.52    33.17       2.721

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     209.52   Tc(MIN.) =   33.17
  TOTAL AREA(ACRES) =      212.4
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    322.00 =    5053.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    322.00 TO NODE    327.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    786.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   847.00   CHANNEL SLOPE =  0.0460
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.530
  LEGUMES(STRAIGHT ROW) GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.57
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   37.13
  SUBAREA AREA(ACRES) =     7.40       SUBAREA RUNOFF(CFS) =    5.62
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.334
  TOTAL AREA(ACRES) =      219.8         PEAK FLOW RATE(CFS) =     209.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   3.57
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    327.00 =    5900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    327.00 TO NODE    327.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   37.13
  RAINFALL INTENSITY(INCH/HR) =   2.53
  TOTAL STREAM AREA(ACRES) =   219.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    209.52

****************************************************************************
  FLOW PROCESS FROM NODE    328.00 TO NODE    329.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    912.00
  DOWNSTREAM ELEVATION(FEET) =    910.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
   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) =      0.10   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    329.00 TO NODE    330.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    910.00  DOWNSTREAM(FEET) =    830.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.00   CHANNEL SLOPE =  0.0559
  CHANNEL BASE(FEET) =   24.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.170
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   2.89
```

```
  Tc(MIN.) =    7.39
  SUBAREA AREA(ACRES) =    21.00       SUBAREA RUNOFF(CFS) =   81.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  TOTAL AREA(ACRES) =       21.1         PEAK FLOW RATE(CFS) =      81.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =  10.64
  LONGEST FLOWPATH FROM NODE    328.00 TO NODE    330.00 =    1482.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    331.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   824.00  DOWNSTREAM(FEET) =   810.00
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.71
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      81.70
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    7.49
  LONGEST FLOWPATH FROM NODE    328.00 TO NODE    331.00 =    1644.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    331.00 TO NODE    332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    810.00  DOWNSTREAM(FEET) =    809.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    90.00   CHANNEL SLOPE =  0.0056
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.752
  LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  74
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      83.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.45
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   0.61
  Tc(MIN.) =    8.11
  SUBAREA AREA(ACRES) =     1.40       SUBAREA RUNOFF(CFS) =    2.84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.525
  TOTAL AREA(ACRES) =       22.5         PEAK FLOW RATE(CFS) =      81.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   2.44
  LONGEST FLOWPATH FROM NODE    328.00 TO NODE    332.00 =    1734.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    332.00 TO NODE    333.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   804.00  DOWNSTREAM(FEET) =   802.00
```

```
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.26
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      81.70
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.18
  LONGEST FLOWPATH FROM NODE    328.00 TO NODE    333.00 =    1804.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    333.00 TO NODE    327.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    802.00  DOWNSTREAM(FEET) =    786.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00   CHANNEL SLOPE =  0.0696
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      81.70
  FLOW VELOCITY(FEET/SEC.) =   5.20   FLOW DEPTH(FEET) =   0.99
  TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =    8.92
  LONGEST FLOWPATH FROM NODE    328.00 TO NODE    327.00 =    2034.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    327.00 TO NODE    327.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =    22.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     81.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      209.52    37.13        2.530        219.80
      2       81.70     8.92        6.350         22.50

  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      165.19     8.92       6.350
      2      242.07    37.13       2.530

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     242.07   Tc(MIN.) =   37.13
  TOTAL AREA(ACRES) =      242.3
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    327.00 =    5900.00 FEET.

+--------------------------------------------------------------------------+
```

```
| FLOW EXITS SOUTHWESTELRY PROJECT BOUNDARY                              |
| END OF BASIN 300 ANALYSIS                                              |
|                                                                        |
+------------------------------------------------------------------------+
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      242.3  TC(MIN.) =     37.13
  PEAK FLOW RATE(CFS)   =     242.07
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

100-YEAR HYDROGRAPH CALCULATIONS
PRE-DEVELOPMENT CONDITIONS

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

              F L O O D   R O U T I N G    A N A L Y S I S

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  DEPARTMENT OF PUBLIC WORKS FLOOD CONTROL DIVISION HYDROLOGY MANUAL(2003)
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                   TEL:  858-587-8070, FAX:  858-587-8750

 ************************** DESCRIPTION OF STUDY **************************
* LILAC HILLS RANCH TM                                                    *
* PRELIMINARY HYDROGRAPH                                                  *
* PRE-DEVELOPMENT, 100-YEAR STORM                                         *
 ***************************************************************************

  FILE NAME: 1037EXH.DAT
  TIME/DATE OF STUDY: 12:33 02/17/2012
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  FLOW PROCESS FROM NODE    101.00 TO NODE    150.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERCOURSE LENGTH =    9073.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    4418.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     556.000 FEET
         BASIN FACTOR = 0.030
         WATERSHED AREA =     617.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.276 HOURS
         * Instantaneous Unit-Hydrograph Option Selected.
          CAUTION: LAG TIME IS LESS THAN 0.75 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         S.C.S. S-GRAPH SELECTED
         WATERSHED RUNOFF CURVE NUMBER =  85.00

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.77
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.45
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.86
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.74
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  8.00
         24-HOUR NESTED DESIGN STORM DISTRIBUTION SELECTED
         (Ref: San Diego County Hydrology Manual)

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.989
          30-MINUTE FACTOR = 0.989
           1-HOUR FACTOR = 0.994
           3-HOUR FACTOR = 0.996
           6-HOUR FACTOR = 0.997
          24-HOUR FACTOR = 0.998

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  30.231


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL       "q/qp" GRAPH          UNIT HYDROGRAPH
     NUMBER               VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 0.251                492.877
        2                 0.821               1614.329
        3                 0.995               1954.902
        4                 0.777               1527.479
        5                 0.423                830.524
        6                 0.242                475.596
```

7	0.136	267.361
8	0.076	150.145
9	0.043	85.077
10	0.025	48.596
11	0.014	27.219
12	0.009	16.709
13	0.004	8.670
14	0.001	1.779
15	0.000	0.000

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0166	0.0166	0.0000
2	0.0166	0.0166	0.0000
3	0.0166	0.0166	0.0000
4	0.0167	0.0167	0.0000
5	0.0167	0.0167	0.0000
6	0.0167	0.0167	0.0000
7	0.0168	0.0168	0.0000
8	0.0168	0.0168	0.0000
9	0.0169	0.0169	0.0000
10	0.0169	0.0169	0.0000
11	0.0169	0.0169	0.0000
12	0.0170	0.0170	0.0000
13	0.0170	0.0170	0.0000
14	0.0170	0.0170	0.0000
15	0.0171	0.0171	0.0000
16	0.0171	0.0171	0.0000
17	0.0172	0.0172	0.0000
18	0.0172	0.0172	0.0000
19	0.0172	0.0172	0.0000
20	0.0173	0.0173	0.0000
21	0.0173	0.0173	0.0000
22	0.0174	0.0171	0.0002
23	0.0174	0.0169	0.0006
24	0.0174	0.0166	0.0009
25	0.0175	0.0163	0.0012
26	0.0175	0.0160	0.0015
27	0.0176	0.0158	0.0018
28	0.0176	0.0155	0.0021
29	0.0177	0.0153	0.0024
30	0.0177	0.0150	0.0027
31	0.0177	0.0148	0.0030
32	0.0178	0.0145	0.0032
33	0.0178	0.0143	0.0035
34	0.0179	0.0141	0.0038
35	0.0179	0.0139	0.0040
36	0.0180	0.0137	0.0043
37	0.0180	0.0135	0.0046
38	0.0181	0.0133	0.0048
39	0.0181	0.0131	0.0050
40	0.0181	0.0129	0.0053
41	0.0182	0.0127	0.0055
42	0.0182	0.0125	0.0057
43	0.0183	0.0123	0.0060
44	0.0183	0.0121	0.0062
45	0.0184	0.0120	0.0064
46	0.0184	0.0118	0.0066
47	0.0185	0.0117	0.0069
48	0.0185	0.0115	0.0071
49	0.0186	0.0113	0.0073
50	0.0186	0.0112	0.0075
51	0.0187	0.0110	0.0077
52	0.0188	0.0109	0.0079
53	0.0188	0.0107	0.0081
54	0.0189	0.0106	0.0083

55	0.0189	0.0105	0.0085
56	0.0190	0.0103	0.0086
57	0.0190	0.0102	0.0088
58	0.0191	0.0101	0.0090
59	0.0192	0.0099	0.0092
60	0.0192	0.0098	0.0094
61	0.0193	0.0097	0.0096
62	0.0193	0.0096	0.0097
63	0.0194	0.0095	0.0099
64	0.0194	0.0093	0.0101
65	0.0195	0.0092	0.0103
66	0.0196	0.0091	0.0104
67	0.0196	0.0090	0.0106
68	0.0197	0.0089	0.0108
69	0.0198	0.0088	0.0110
70	0.0198	0.0087	0.0111
71	0.0199	0.0086	0.0113
72	0.0199	0.0085	0.0114
73	0.0200	0.0084	0.0116
74	0.0201	0.0083	0.0118
75	0.0202	0.0082	0.0119
76	0.0202	0.0081	0.0121
77	0.0203	0.0080	0.0123
78	0.0203	0.0079	0.0124
79	0.0204	0.0079	0.0126
80	0.0205	0.0078	0.0127
81	0.0206	0.0077	0.0129
82	0.0206	0.0076	0.0130
83	0.0207	0.0075	0.0132
84	0.0208	0.0074	0.0133
85	0.0209	0.0074	0.0135
86	0.0209	0.0073	0.0136
87	0.0211	0.0072	0.0138
88	0.0211	0.0072	0.0140
89	0.0212	0.0071	0.0141
90	0.0213	0.0070	0.0143
91	0.0214	0.0069	0.0144
92	0.0214	0.0069	0.0146
93	0.0216	0.0068	0.0147
94	0.0216	0.0067	0.0149
95	0.0217	0.0067	0.0150
96	0.0218	0.0066	0.0152
97	0.0219	0.0066	0.0154
98	0.0220	0.0065	0.0155
99	0.0221	0.0064	0.0157
100	0.0222	0.0064	0.0158
101	0.0223	0.0063	0.0160
102	0.0224	0.0063	0.0161
103	0.0225	0.0062	0.0163
104	0.0226	0.0061	0.0164
105	0.0227	0.0061	0.0166
106	0.0228	0.0060	0.0167
107	0.0229	0.0060	0.0169
108	0.0230	0.0059	0.0170
109	0.0231	0.0059	0.0172
110	0.0232	0.0058	0.0174
111	0.0233	0.0058	0.0176
112	0.0234	0.0057	0.0177
113	0.0236	0.0057	0.0179
114	0.0237	0.0056	0.0180

115	0.0238	0.0056	0.0182
116	0.0239	0.0056	0.0183
117	0.0241	0.0055	0.0186
118	0.0242	0.0055	0.0187
119	0.0243	0.0054	0.0189
120	0.0244	0.0054	0.0190
121	0.0246	0.0054	0.0192
122	0.0247	0.0053	0.0194
123	0.0249	0.0053	0.0196
124	0.0250	0.0052	0.0198
125	0.0252	0.0052	0.0200
126	0.0253	0.0052	0.0201
127	0.0255	0.0051	0.0204
128	0.0256	0.0051	0.0205
129	0.0258	0.0051	0.0207
130	0.0259	0.0050	0.0209
131	0.0261	0.0050	0.0211
132	0.0263	0.0050	0.0213
133	0.0265	0.0049	0.0216
134	0.0266	0.0049	0.0217
135	0.0269	0.0049	0.0220
136	0.0270	0.0048	0.0221
137	0.0272	0.0048	0.0224
138	0.0274	0.0048	0.0226
139	0.0276	0.0048	0.0229
140	0.0278	0.0047	0.0231
141	0.0281	0.0047	0.0234
142	0.0282	0.0047	0.0235
143	0.0285	0.0047	0.0239
144	0.0287	0.0046	0.0240
145	0.0101	0.0016	0.0085
146	0.0176	0.0028	0.0148
147	0.0179	0.0028	0.0151
148	0.0181	0.0028	0.0152
149	0.0184	0.0029	0.0156
150	0.0186	0.0029	0.0157
151	0.0190	0.0029	0.0161
152	0.0192	0.0029	0.0163
153	0.0196	0.0029	0.0166
154	0.0198	0.0029	0.0168
155	0.0202	0.0030	0.0173
156	0.0205	0.0030	0.0175
157	0.0210	0.0030	0.0179
158	0.0212	0.0030	0.0182
159	0.0217	0.0031	0.0186
160	0.0220	0.0031	0.0189
161	0.0226	0.0032	0.0195
162	0.0229	0.0032	0.0198
163	0.0236	0.0032	0.0203
164	0.0239	0.0032	0.0207
165	0.0247	0.0033	0.0213
166	0.0250	0.0033	0.0217
167	0.0259	0.0034	0.0225
168	0.0263	0.0034	0.0229
169	0.0274	0.0035	0.0239
170	0.0279	0.0036	0.0243
171	0.0290	0.0036	0.0253
172	0.0296	0.0037	0.0259
173	0.0308	0.0038	0.0270
174	0.0315	0.0038	0.0277

175	0.0330	0.0040	0.0290
176	0.0338	0.0040	0.0298
177	0.0356	0.0042	0.0315
178	0.0366	0.0042	0.0324
179	0.0389	0.0044	0.0345
180	0.0401	0.0045	0.0356
181	0.0430	0.0047	0.0383
182	0.0447	0.0048	0.0398
183	0.0485	0.0052	0.0434
184	0.0508	0.0053	0.0455
185	0.0578	0.0059	0.0519
186	0.0611	0.0061	0.0549
187	0.0695	0.0068	0.0627
188	0.0751	0.0072	0.0679
189	0.0900	0.0083	0.0816
190	0.1025	0.0092	0.0933
191	0.1505	0.0129	0.1375
192	0.2120	0.0172	0.1948
193	0.7599	0.0531	0.7067
194	0.1207	0.0074	0.1133
195	0.0821	0.0049	0.0772
196	0.0649	0.0038	0.0611
197	0.0534	0.0031	0.0503
198	0.0465	0.0026	0.0438
199	0.0415	0.0023	0.0392
200	0.0377	0.0021	0.0356
201	0.0347	0.0019	0.0328
202	0.0322	0.0018	0.0305
203	0.0302	0.0016	0.0285
204	0.0284	0.0015	0.0269
205	0.0268	0.0014	0.0253
206	0.0255	0.0013	0.0241
207	0.0243	0.0013	0.0230
208	0.0232	0.0012	0.0220
209	0.0223	0.0012	0.0212
210	0.0215	0.0011	0.0204
211	0.0207	0.0011	0.0196
212	0.0200	0.0010	0.0190
213	0.0194	0.0010	0.0184
214	0.0188	0.0009	0.0178
215	0.0182	0.0009	0.0173
216	0.0177	0.0009	0.0168
217	0.0288	0.0014	0.0274
218	0.0284	0.0014	0.0270
219	0.0279	0.0014	0.0266
220	0.0275	0.0013	0.0262
221	0.0271	0.0013	0.0258
222	0.0267	0.0013	0.0254
223	0.0264	0.0013	0.0251
224	0.0260	0.0012	0.0248
225	0.0257	0.0012	0.0245
226	0.0254	0.0012	0.0242
227	0.0251	0.0012	0.0239
228	0.0248	0.0011	0.0236
229	0.0245	0.0011	0.0234
230	0.0243	0.0011	0.0231
231	0.0240	0.0011	0.0229
232	0.0237	0.0011	0.0227
233	0.0235	0.0011	0.0224
234	0.0233	0.0010	0.0222

235	0.0230	0.0010	0.0220
236	0.0228	0.0010	0.0218
237	0.0226	0.0010	0.0216
238	0.0224	0.0010	0.0214
239	0.0222	0.0010	0.0213
240	0.0220	0.0010	0.0211
241	0.0218	0.0009	0.0209
242	0.0217	0.0009	0.0207
243	0.0215	0.0009	0.0206
244	0.0213	0.0009	0.0204
245	0.0212	0.0009	0.0203
246	0.0210	0.0009	0.0201
247	0.0208	0.0009	0.0200
248	0.0207	0.0009	0.0198
249	0.0205	0.0009	0.0197
250	0.0204	0.0008	0.0196
251	0.0203	0.0008	0.0194
252	0.0201	0.0008	0.0193
253	0.0200	0.0008	0.0192
254	0.0199	0.0008	0.0190
255	0.0197	0.0008	0.0189
256	0.0196	0.0008	0.0188
257	0.0195	0.0008	0.0187
258	0.0194	0.0008	0.0186
259	0.0192	0.0008	0.0185
260	0.0191	0.0008	0.0184
261	0.0190	0.0007	0.0183
262	0.0189	0.0007	0.0182
263	0.0188	0.0007	0.0181
264	0.0187	0.0007	0.0180
265	0.0186	0.0007	0.0179
266	0.0185	0.0007	0.0178
267	0.0184	0.0007	0.0177
268	0.0183	0.0007	0.0176
269	0.0182	0.0007	0.0175
270	0.0181	0.0007	0.0174
271	0.0180	0.0007	0.0173
272	0.0179	0.0007	0.0172
273	0.0178	0.0007	0.0171
274	0.0177	0.0007	0.0171
275	0.0176	0.0007	0.0170
276	0.0175	0.0006	0.0169
277	0.0175	0.0006	0.0168
278	0.0174	0.0006	0.0167
279	0.0173	0.0006	0.0167
280	0.0172	0.0006	0.0166
281	0.0171	0.0006	0.0165
282	0.0171	0.0006	0.0164
283	0.0170	0.0006	0.0164
284	0.0169	0.0006	0.0163
285	0.0168	0.0006	0.0162
286	0.0168	0.0006	0.0162
287	0.0167	0.0006	0.0161
288	0.0166	0.0006	0.0160

TOTAL STORM RAINFALL(INCHES) = 7.98
TOTAL SOIL-LOSS(INCHES) = 1.79
TOTAL EFFECTIVE RAINFALL(INCHES) = 6.20

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    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      91.9159
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     320.2163
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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	550.0	1100.0	1650.0	2200.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0000	0.00	Q	.	.	.	.
0.833	0.0000	0.00	Q	.	.	.	.
0.917	0.0000	0.00	Q	.	.	.	.
1.000	0.0000	0.00	Q	.	.	.	.
1.083	0.0000	0.00	Q	.	.	.	.
1.167	0.0000	0.00	Q	.	.	.	.
1.250	0.0000	0.00	Q	.	.	.	.
1.333	0.0000	0.00	Q	.	.	.	.
1.417	0.0000	0.00	Q	.	.	.	.
1.500	0.0000	0.00	Q	.	.	.	.
1.583	0.0000	0.00	Q	.	.	.	.
1.667	0.0000	0.00	Q	.	.	.	.
1.750	0.0000	0.00	Q	.	.	.	.
1.833	0.0008	0.12	Q	.	.	.	.
1.917	0.0052	0.64	Q	.	.	.	.
2.000	0.0174	1.77	Q	.	.	.	.
2.083	0.0411	3.44	Q	.	.	.	.
2.167	0.0785	5.43	Q	.	.	.	.
2.250	0.1307	7.58	Q	.	.	.	.
2.333	0.1982	9.80	Q	.	.	.	.
2.417	0.2811	12.04	Q	.	.	.	.
2.500	0.3793	14.26	Q	.	.	.	.
2.583	0.4927	16.46	Q	.	.	.	.
2.667	0.6210	18.64	Q	.	.	.	.
2.750	0.7641	20.77	Q	.	.	.	.
2.833	0.9216	22.87	Q	.	.	.	.
2.917	1.0932	24.92	Q	.	.	.	.
3.000	1.2788	26.94	Q	.	.	.	.
3.083	1.4780	28.93	Q	.	.	.	.
3.167	1.6906	30.87	Q	.	.	.	.
3.250	1.9164	32.78	Q	.	.	.	.
3.333	2.1551	34.66	Q	.	.	.	.
3.417	2.4066	36.51	Q	.	.	.	.
3.500	2.6705	38.32	Q	.	.	.	.
3.583	2.9467	40.11	Q	.	.	.	.
3.667	3.2351	41.86	Q	.	.	.	.
3.750	3.5353	43.59	Q	.	.	.	.
3.833	3.8472	45.29	Q	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	550.0	1100.0	1650.0	2200.0
3.917	4.1707	46.97	Q	.	.	.	.
4.000	4.5055	48.61	Q	.	.	.	.
4.083	4.8515	50.24	Q	.	.	.	.
4.167	5.2085	51.84	Q	.	.	.	.
4.250	5.5764	53.42	Q	.	.	.	.
4.333	5.9550	54.97	Q	.	.	.	.
4.417	6.3442	56.51	VQ	.	.	.	.
4.500	6.7438	58.02	VQ	.	.	.	.
4.583	7.1537	59.52	VQ	.	.	.	.
4.667	7.5737	60.99	VQ	.	.	.	.
4.750	8.0038	62.45	VQ	.	.	.	.
4.833	8.4439	63.89	.Q	.	.	.	.
4.917	8.8937	65.32	.Q	.	.	.	.
5.000	9.3532	66.72	.Q	.	.	.	.
5.083	9.8223	68.11	.Q	.	.	.	.
5.167	10.3009	69.49	.Q	.	.	.	.
5.250	10.7889	70.85	.Q	.	.	.	.
5.333	11.2861	72.20	.Q	.	.	.	.
5.417	11.7925	73.53	.Q	.	.	.	.
5.500	12.3081	74.86	.Q	.	.	.	.
5.583	12.8326	76.16	.Q	.	.	.	.
5.667	13.3661	77.46	.Q	.	.	.	.
5.750	13.9084	78.75	.Q	.	.	.	.
5.833	14.4596	80.02	.Q	.	.	.	.
5.917	15.0194	81.29	.Q	.	.	.	.
6.000	15.5879	82.54	.Q	.	.	.	.
6.083	16.1650	83.79	.QV	.	.	.	.
6.167	16.7505	85.03	.QV	.	.	.	.
6.250	17.3446	86.25	.QV	.	.	.	.
6.333	17.9470	87.48	.QV	.	.	.	.
6.417	18.5578	88.69	.QV	.	.	.	.
6.500	19.1769	89.90	.QV	.	.	.	.
6.583	19.8043	91.09	.QV	.	.	.	.
6.667	20.4399	92.29	.QV	.	.	.	.
6.750	21.0836	93.47	.QV	.	.	.	.
6.833	21.7355	94.66	.QV	.	.	.	.
6.917	22.3955	95.83	.QV	.	.	.	.
7.000	23.0636	97.00	.QV	.	.	.	.
7.083	23.7397	98.17	.QV	.	.	.	.
7.167	24.4238	99.33	.Q V	.	.	.	.
7.250	25.1159	100.49	.Q V	.	.	.	.
7.333	25.8160	101.65	.Q V	.	.	.	.
7.417	26.5240	102.80	.Q V	.	.	.	.
7.500	27.2400	103.96	.Q V	.	.	.	.
7.583	27.9639	105.11	.Q V	.	.	.	.
7.667	28.6957	106.26	.Q V	.	.	.	.
7.750	29.4354	107.40	.Q V	.	.	.	.
7.833	30.1830	108.55	.Q V	.	.	.	.
7.917	30.9384	109.70	.Q V	.	.	.	.
8.000	31.7019	110.85	. QV	.	.	.	.

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      550.0    1100.0    1650.0    2200.0
-----------------------------------------------------------------------------
   8.083     32.4731    111.99  . Q V     .         .         .         .
   8.167     33.2523    113.14  . Q V     .         .         .         .
   8.250     34.0394    114.29  . Q V     .         .         .         .
   8.333     34.8345    115.44  . Q V     .         .         .         .
   8.417     35.6374    116.59  . Q V     .         .         .         .
   8.500     36.4484    117.75  . Q V     .         .         .         .
   8.583     37.2673    118.90  . Q V     .         .         .         .
   8.667     38.0942    120.07  . Q V     .         .         .         .
   8.750     38.9291    121.23  . Q V     .         .         .         .
   8.833     39.7721    122.40  . Q V     .         .         .         .
   8.917     40.6231    123.57  . Q  V    .         .         .         .
   9.000     41.4823    124.75  . Q  V    .         .         .         .
   9.083     42.3496    125.93  . Q  V    .         .         .         .
   9.167     43.2252    127.13  . Q  V    .         .         .         .
   9.250     44.1089    128.32  . Q  V    .         .         .         .
   9.333     45.0010    129.53  . Q  V    .         .         .         .
   9.417     45.9013    130.73  . Q  V    .         .         .         .
   9.500     46.8101    131.96  . Q  V    .         .         .         .
   9.583     47.7273    133.18  . Q  V    .         .         .         .
   9.667     48.6531    134.42  . Q   V   .         .         .         .
   9.750     49.5874    135.66  . Q   V   .         .         .         .
   9.833     50.5303    136.92  . Q   V   .         .         .         .
   9.917     51.4820    138.18  . Q   V   .         .         .         .
  10.000     52.4425    139.46  . Q   V   .         .         .         .
  10.083     53.4118    140.75  . Q   V   .         .         .         .
  10.167     54.3902    142.06  . Q   V   .         .         .         .
  10.250     55.3775    143.36  . Q   V   .         .         .         .
  10.333     56.3741    144.70  . Q    V  .         .         .         .
  10.417     57.3799    146.04  . Q    V  .         .         .         .
  10.500     58.3950    147.40  . Q    V  .         .         .         .
  10.583     59.4196    148.77  . Q    V  .         .         .         .
  10.667     60.4539    150.17  . Q    V  .         .         .         .
  10.750     61.4978    151.58  . Q    V  .         .         .         .
  10.833     62.5516    153.01  . Q    V  .         .         .         .
  10.917     63.6153    154.45  . Q    V  .         .         .         .
  11.000     64.6892    155.93  . Q     V .         .         .         .
  11.083     65.7734    157.42  . Q     V .         .         .         .
  11.167     66.8680    158.94  . Q     V .         .         .         .
  11.250     67.9731    160.47  . Q     V .         .         .         .
  11.333     69.0891    162.04  . Q     V .         .         .         .
  11.417     70.2159    163.62  . Q     V .         .         .         .
  11.500     71.3540    165.25  .  Q    V .         .         .         .
  11.583     72.5033    166.88  .  Q     V.         .         .         .
  11.667     73.6643    168.57  .  Q     V.         .         .         .
  11.750     74.8370    170.27  .  Q     V.         .         .         .
  11.833     76.0217    172.02  .  Q     V.         .         .         .
  11.917     77.2186    173.79  .  Q     V.         .         .         .
  12.000     78.4281    175.62  .  Q     V.         .         .         .
  12.083     79.5964    169.63  .  Q     V.         .         .         .
  12.167     80.6218    148.89  . Q       V         .         .         .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      550.0    1100.0    1650.0    2200.0
-----------------------------------------------------------------------------
  12.250     81.5140    129.56  . Q       V         .         .         .
  12.333     82.3342    119.09  . Q       V         .         .         .
  12.417     83.1402    117.03  . Q       V         .         .         .
  12.500     83.9416    116.37  . Q       V         .         .         .
  12.583     84.7464    116.85  . Q       V         .         .         .
  12.667     85.5591    118.00  . Q       V         .         .         .
  12.750     86.3821    119.51  . Q       V         .         .         .
  12.833     87.2175    121.29  . Q       V         .         .         .
  12.917     88.0662    123.23  . Q       .V        .         .         .
  13.000     88.9293    125.33  . Q       .V        .         .         .
  13.083     89.8078    127.55  . Q       .V        .         .         .
  13.167     90.7029    129.96  . Q       .V        .         .         .
  13.250     91.6149    132.43  . Q       .V        .         .         .
  13.333     92.5450    135.04  . Q       .V        .         .         .
  13.417     93.4935    137.73  . Q       .V        .         .         .
  13.500     94.4618    140.60  . Q       .V        .         .         .
  13.583     95.4506    143.56  . Q       .V        .         .         .
  13.667     96.4611    146.73  . Q       . V       .         .         .
  13.750     97.4943    150.02  . Q       . V       .         .         .
  13.833     98.5517    153.54  . Q       . V       .         .         .
  13.917     99.6344    157.21  . Q       . V       .         .         .
  14.000    100.7443    161.16  . Q       . V       .         .         .
  14.083    101.8831    165.35  .  Q      . V       .         .         .
  14.167    103.0540    170.02  .  Q      . V       .         .         .
  14.250    104.2589    174.95  .  Q      .  V      .         .         .
  14.333    105.5002    180.23  .  Q      .  V      .         .         .
  14.417    106.7791    185.71  .  Q      .  V      .         .         .
  14.500    108.0989    191.64  .  Q      .  V      .         .         .
  14.583    109.4620    197.92  .  Q      .  V      .         .         .
  14.667    110.8726    204.82  .  Q      .  V      .         .         .
  14.750    112.3342    212.22  .  Q      .   V     .         .         .
  14.833    113.8523    220.44  .   Q     .   V     .         .         .
  14.917    115.4319    229.36  .   Q     .   V     .         .         .
  15.000    117.0806    239.38  .   Q     .   V     .         .         .
  15.083    118.8052    250.41  .   Q     .   V     .         .         .
  15.167    120.6165    263.00  .   Q     .    V    .         .         .
  15.250    122.5249    277.10  .    Q    .    V    .         .         .
  15.333    124.5464    293.52  .    Q    .    V    .         .         .
  15.417    126.7023    313.04  .    Q    .    V    .         .         .
  15.500    129.0285    337.77  .     Q   .     V   .         .         .
  15.583    131.5569    367.12  .     Q   .     V   .         .         .
  15.667    134.3291    402.52  .      Q  .     V   .         .         .
  15.750    137.3970    445.47  .       Q .      V  .         .         .
  15.833    140.8572    502.42  .        Q.      V  .         .         .
  15.917    144.9081    588.19  .         Q       V .         .         .
  16.000    150.0169    741.79  .         .  Q    V .         .         .
  16.083    158.3368   1208.05  .         .        V.Q        .         .
  16.167    171.7045   1940.98  .         .         .V        .    Q    .
  16.250    186.1758   2101.23  .         .         .  V      .       Q .
  16.333    198.1024   1731.75  .         .         .   V     .Q        .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      550.0    1100.0    1650.0    2200.0
-----------------------------------------------------------------------------
  16.417    206.3062   1191.19  .         .         .Q   V    .         .
  16.500    212.2188    858.51  .         .    Q    .     V   .         .
  16.583    216.6140    638.19  .         .Q        .      V  .         .
  16.667    220.0236    495.07  .        Q.         .      V  .         .
  16.750    222.7882    401.42  .      Q  .         .      V  .         .
  16.833    225.1174    338.21  .     Q   .         .       V .         .
  16.917    227.1400    293.68  .    Q    .         .       V .         .
  17.000    228.9462    262.25  .   Q     .         .       V .         .
  17.083    230.5798    237.21  .   Q     .         .       V .         .
  17.167    232.0720    216.67  .  Q      .         .       V .         .
  17.250    233.4628    201.94  .  Q      .         .        V.         .
  17.333    234.7746    190.48  .  Q      .         .        V.         .
  17.417    236.0193    180.72  .  Q      .         .        V.         .
  17.500    237.2056    172.25  .  Q      .         .        V.         .
  17.583    238.3405    164.79  . Q       .         .        V.         .
  17.667    239.4296    158.14  . Q       .         .        V.         .
  17.750    240.4776    152.17  . Q       .         .         V         .
  17.833    241.4883    146.76  . Q       .         .         V         .
  17.917    242.4651    141.83  . Q       .         .         V         .
  18.000    243.4108    137.32  . Q       .         .         V         .
  18.083    244.3652    138.59  . Q       .         .         V         .
  18.167    245.4155    152.50  . Q       .         .         V         .
  18.250    246.5892    170.41  .  Q      .         .         V         .
  18.333    247.8551    183.82  .  Q      .         .         V         .
  18.417    249.1619    189.75  .  Q      .         .         .V        .
  18.500    250.4838    191.93  .  Q      .         .         .V        .
  18.583    251.8060    191.98  .  Q      .         .         .V        .
  18.667    253.1206    190.89  .  Q      .         .         .V        .
  18.750    254.4237    189.21  .  Q      .         .         .V        .
  18.833    255.7133    187.25  .  Q      .         .         .V        .
  18.917    256.9886    185.17  .  Q      .         .         . V       .
  19.000    258.2495    183.08  .  Q      .         .         . V       .
  19.083    259.4961    181.00  .  Q      .         .         . V       .
  19.167    260.7284    178.93  .  Q      .         .         . V       .
  19.250    261.9469    176.93  .  Q      .         .         . V       .
  19.333    263.1521    175.00  .  Q      .         .         . V       .
  19.417    264.3446    173.15  .  Q      .         .         .  V      .
  19.500    265.5248    171.37  .  Q      .         .         .  V      .
  19.583    266.6932    169.65  .  Q      .         .         .  V      .
  19.667    267.8501    167.99  .  Q      .         .         .  V      .
  19.750    268.9960    166.38  .  Q      .         .         .  V      .
  19.833    270.1313    164.83  . Q       .         .         .  V      .
  19.917    271.2562    163.34  . Q       .         .         .  V      .
  20.000    272.3711    161.89  . Q       .         .         .   V     .
  20.083    273.4763    160.48  . Q       .         .         .   V     .
  20.167    274.5721    159.12  . Q       .         .         .   V     .
  20.250    275.6589    157.80  . Q       .         .         .   V     .
  20.333    276.7368    156.51  . Q       .         .         .   V     .
  20.417    277.8061    155.27  . Q       .         .         .   V     .
  20.500    278.8671    154.06  . Q       .         .         .   V     .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      550.0    1100.0    1650.0    2200.0
-----------------------------------------------------------------------------
  20.583    279.9200    152.88  . Q       .         .         .   V     .
  20.667    280.9650    151.73  . Q       .         .         .    V    .
  20.750    282.0023    150.61  . Q       .         .         .    V    .
  20.833    283.0321    149.53  . Q       .         .         .    V    .
  20.917    284.0546    148.47  . Q       .         .         .    V    .
  21.000    285.0700    147.43  . Q       .         .         .    V    .
  21.083    286.0784    146.43  . Q       .         .         .    V    .
  21.167    287.0801    145.44  . Q       .         .         .    V    .
  21.250    288.0752    144.48  . Q       .         .         .    V    .
  21.333    289.0638    143.55  . Q       .         .         .     V   .
  21.417    290.0461    142.63  . Q       .         .         .     V   .
  21.500    291.0222    141.74  . Q       .         .         .     V   .
  21.583    291.9923    140.86  . Q       .         .         .     V   .
  21.667    292.9565    140.00  . Q       .         .         .     V   .
  21.750    293.9150    139.17  . Q       .         .         .     V   .
  21.833    294.8678    138.34  . Q       .         .         .     V   .
  21.917    295.8150    137.54  . Q       .         .         .     V   .
  22.000    296.7569    136.76  . Q       .         .         .      V  .
  22.083    297.6934    135.99  . Q       .         .         .      V  .
  22.167    298.6248    135.23  . Q       .         .         .      V  .
  22.250    299.5510    134.49  . Q       .         .         .      V  .
  22.333    300.4722    133.76  . Q       .         .         .      V  .
  22.417    301.3885    133.05  . Q       .         .         .      V  .
  22.500    302.3001    132.35  . Q       .         .         .      V  .
  22.583    303.2069    131.67  . Q       .         .         .      V  .
  22.667    304.1090    130.99  . Q       .         .         .      V  .
  22.750    305.0067    130.33  . Q       .         .         .       V .
  22.833    305.8998    129.68  . Q       .         .         .       V .
  22.917    306.7886    129.05  . Q       .         .         .       V .
  23.000    307.6730    128.42  . Q       .         .         .       V .
  23.083    308.5532    127.80  . Q       .         .         .       V .
  23.167    309.4292    127.20  . Q       .         .         .       V .
  23.250    310.3012    126.61  . Q       .         .         .       V .
  23.333    311.1691    126.02  . Q       .         .         .       V .
  23.417    312.0331    125.45  . Q       .         .         .       V .
  23.500    312.8931    124.88  . Q       .         .         .        V.
  23.583    313.7494    124.32  . Q       .         .         .        V.
  23.667    314.6018    123.78  . Q       .         .         .        V.
  23.750    315.4506    123.24  . Q       .         .         .        V.
  23.833    316.2957    122.71  . Q       .         .         .        V.
  23.917    317.1371    122.18  . Q       .         .         .        V.
  24.000    317.9751    121.67  . Q       .         .         .        V.
  24.083    318.7553    113.29  . Q       .         .         .        V.
  24.167    319.3547     87.03  .Q        .         .         .        V.
  24.250    319.7366     55.45  .Q        .         .         .        V.
  24.333    319.9489     30.82  Q         .         .         .        V.
  24.417    320.0689     17.43  Q         .         .         .        V.
  24.500    320.1361      9.76  Q         .         .         .        V.
  24.583    320.1736      5.45  Q         .         .         .        V.
  24.667    320.1945      3.03  Q         .         .         .        V.
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      550.0    1100.0    1650.0    2200.0
-----------------------------------------------------------------------------
  24.750    320.2059      1.66  Q         .         .         .        V.
  24.833    320.2119      0.87  Q         .         .         .        V.
  24.917    320.2149      0.44  Q         .         .         .        V.
  25.000    320.2161      0.17  Q         .         .         .        V.
  25.083    320.2163      0.03  Q         .         .         .        V.
  25.167    320.2163      0.00  Q         .         .         .        V.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    223.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

         WATERCOURSE LENGTH =    8028.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    3765.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     603.000 FEET
         BASIN FACTOR = 0.030
         WATERSHED AREA =     520.300 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.238 HOURS
         * Instantaneous Unit-Hydrograph Option Selected.
          CAUTION: LAG TIME IS LESS THAN 0.75 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         S.C.S. S-GRAPH SELECTED
         WATERSHED RUNOFF CURVE NUMBER =  85.00

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.77
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.45
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.86
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.74
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  8.00
         24-HOUR NESTED DESIGN STORM DISTRIBUTION SELECTED
         (Ref: San Diego County Hydrology Manual)

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.991
          30-MINUTE FACTOR = 0.991
           1-HOUR FACTOR = 0.995
           3-HOUR FACTOR = 0.997
           6-HOUR FACTOR = 0.998
          24-HOUR FACTOR = 0.998

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  34.981


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL       "q/qp" GRAPH          UNIT HYDROGRAPH
     NUMBER               VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 0.319                611.670
        2                 0.937               1795.146
        3                 0.918               1758.605
        4                 0.537               1028.656
        5                 0.269                516.266
        6                 0.140                268.361
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        7                 0.073                139.004
        8                 0.037                 71.767
        9                 0.019                 37.246
       10                 0.010                 19.747
       11                 0.005                 10.417
       12                 0.001                  2.503
       13                 0.000                  0.000


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

         TOTAL STORM RAINFALL(INCHES) =  7.99
         TOTAL SOIL-LOSS(INCHES) =  1.79
         TOTAL EFFECTIVE RAINFALL(INCHES) =  6.20

--------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      77.4513
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     267.3038
--------------------------------------------------------------------------
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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0000	0.00	Q	.	.	.	.
0.833	0.0000	0.00	Q	.	.	.	.
0.917	0.0000	0.00	Q	.	.	.	.
1.000	0.0000	0.00	Q	.	.	.	.
1.083	0.0000	0.00	Q	.	.	.	.
1.167	0.0000	0.00	Q	.	.	.	.
1.250	0.0000	0.00	Q	.	.	.	.
1.333	0.0000	0.00	Q	.	.	.	.
1.417	0.0000	0.00	Q	.	.	.	.
1.500	0.0000	0.00	Q	.	.	.	.
1.583	0.0000	0.00	Q	.	.	.	.
1.667	0.0000	0.00	Q	.	.	.	.
1.750	0.0000	0.00	Q	.	.	.	.
1.833	0.0010	0.14	Q	.	.	.	.
1.917	0.0062	0.75	Q	.	.	.	.
2.000	0.0194	1.93	Q	.	.	.	.
2.083	0.0437	3.52	Q	.	.	.	.
2.167	0.0802	5.30	Q	.	.	.	.
2.250	0.1296	7.17	Q	.	.	.	.
2.333	0.1920	9.06	Q	.	.	.	.
2.417	0.2674	10.95	Q	.	.	.	.
2.500	0.3556	12.81	Q	.	.	.	.
2.583	0.4565	14.64	Q	.	.	.	.
2.667	0.5697	16.44	Q	.	.	.	.
2.750	0.6951	18.21	Q	.	.	.	.
2.833	0.8325	19.95	Q	.	.	.	.
2.917	0.9816	21.65	Q	.	.	.	.
3.000	1.1422	23.32	Q	.	.	.	.
3.083	1.3140	24.96	Q	.	.	.	.
3.167	1.4970	26.57	Q	.	.	.	.
3.250	1.6908	28.15	Q	.	.	.	.
3.333	1.8954	29.70	Q	.	.	.	.
3.417	2.1105	31.23	Q	.	.	.	.
3.500	2.3359	32.73	Q	.	.	.	.
3.583	2.5714	34.21	Q	.	.	.	.
3.667	2.8170	35.66	Q	.	.	.	.
3.750	3.0724	37.09	Q	.	.	.	.
3.833	3.3376	38.50	Q	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 500.0 1000.0 1500.0 2000.0
3.917	3.6123	39.88	Q . . . .
4.000	3.8963	41.25	Q . . . .
4.083	4.1897	42.59	Q . . . .
4.167	4.4922	43.92	Q . . . .
4.250	4.8037	45.23	Q . . . .
4.333	5.1241	46.52	Q . . . .
4.417	5.4532	47.79	Q . . . .
4.500	5.7910	49.05	Q . . . .
4.583	6.1373	50.29	VQ . . . .
4.667	6.4921	51.51	VQ . . . .
4.750	6.8552	52.72	.Q . . . .
4.833	7.2265	53.92	.Q . . . .
4.917	7.6059	55.10	.Q . . . .
5.000	7.9934	56.26	.Q . . . .
5.083	8.3889	57.42	.Q . . . .
5.167	8.7922	58.56	.Q . . . .
5.250	9.2033	59.69	.Q . . . .
5.333	9.6221	60.81	.Q . . . .
5.417	10.0485	61.92	.Q . . . .
5.500	10.4825	63.02	.Q . . . .
5.583	10.9240	64.10	.Q . . . .
5.667	11.3730	65.18	.Q . . . .
5.750	11.8292	66.25	.Q . . . .
5.833	12.2928	67.31	.Q . . . .
5.917	12.7636	68.36	.Q . . . .
6.000	13.2417	69.41	.Q . . . .
6.083	13.7268	70.44	.QV . . . .
6.167	14.2190	71.47	.QV . . . .
6.250	14.7183	72.49	.QV . . . .
6.333	15.2246	73.51	.QV . . . .
6.417	15.7378	74.52	.QV . . . .
6.500	16.2579	75.52	.QV . . . .
6.583	16.7850	76.52	.QV . . . .
6.667	17.3188	77.52	.QV . . . .
6.750	17.8595	78.50	.QV . . . .
6.833	18.4069	79.49	.QV . . . .
6.917	18.9611	80.47	.QV . . . .
7.000	19.5220	81.45	.QV . . . .
7.083	20.0896	82.42	.Q V . . . .
7.167	20.6639	83.39	.Q V . . . .
7.250	21.2448	84.35	.Q V . . . .
7.333	21.8324	85.32	.Q V . . . .
7.417	22.4267	86.28	.Q V . . . .
7.500	23.0275	87.24	.Q V . . . .
7.583	23.6350	88.20	.Q V . . . .
7.667	24.2490	89.16	.Q V . . . .
7.750	24.8697	90.12	.Q V . . . .
7.833	25.4969	91.08	.Q V . . . .
7.917	26.1307	92.03	.Q V . . . .
8.000	26.7712	92.99	.Q V . . . .

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      500.0    1000.0    1500.0    2000.0
-----------------------------------------------------------------------------
   8.083     27.4182     93.95  .Q  V     .         .         .         .
   8.167     28.0718     94.91  .Q  V     .         .         .         .
   8.250     28.7320     95.86  .Q  V     .         .         .         .
   8.333     29.3989     96.83  .Q  V     .         .         .         .
   8.417     30.0724     97.79  .Q  V     .         .         .         .
   8.500     30.7525     98.76  .Q  V     .         .         .         .
   8.583     31.4393     99.72  .Q  V     .         .         .         .
   8.667     32.1328    100.69  . Q V     .         .         .         .
   8.750     32.8330    101.67  . Q V     .         .         .         .
   8.833     33.5399    102.65  . Q  V    .         .         .         .
   8.917     34.2536    103.63  . Q  V    .         .         .         .
   9.000     34.9741    104.61  . Q  V    .         .         .         .
   9.083     35.7014    105.60  . Q  V    .         .         .         .
   9.167     36.4355    106.60  . Q  V    .         .         .         .
   9.250     37.1766    107.60  . Q  V    .         .         .         .
   9.333     37.9246    108.61  . Q  V    .         .         .         .
   9.417     38.6796    109.62  . Q  V    .         .         .         .
   9.500     39.4416    110.65  . Q  V    .         .         .         .
   9.583     40.2107    111.67  . Q   V   .         .         .         .
   9.667     40.9869    112.71  . Q   V   .         .         .         .
   9.750     41.7703    113.75  . Q   V   .         .         .         .
   9.833     42.5610    114.80  . Q   V   .         .         .         .
   9.917     43.3589    115.86  . Q   V   .         .         .         .
  10.000     44.1643    116.94  . Q   V   .         .         .         .
  10.083     44.9771    118.02  . Q   V   .         .         .         .
  10.167     45.7974    119.11  . Q   V   .         .         .         .
  10.250     46.6253    120.21  . Q   V   .         .         .         .
  10.333     47.4609    121.33  . Q    V  .         .         .         .
  10.417     48.3042    122.45  . Q    V  .         .         .         .
  10.500     49.1555    123.60  . Q    V  .         .         .         .
  10.583     50.0147    124.75  . Q    V  .         .         .         .
  10.667     50.8819    125.93  . Q    V  .         .         .         .
  10.750     51.7573    127.11  . Q    V  .         .         .         .
  10.833     52.6410    128.31  . Q    V  .         .         .         .
  10.917     53.5330    129.53  . Q     V .         .         .         .
  11.000     54.4336    130.77  . Q     V .         .         .         .
  11.083     55.3428    132.02  . Q     V .         .         .         .
  11.167     56.2608    133.29  . Q     V .         .         .         .
  11.250     57.1877    134.58  . Q     V .         .         .         .
  11.333     58.1237    135.90  . Q     V .         .         .         .
  11.417     59.0689    137.24  . Q     V .         .         .         .
  11.500     60.0234    138.60  . Q     V .         .         .         .
  11.583     60.9875    139.99  . Q      V.         .         .         .
  11.667     61.9614    141.40  . Q      V.         .         .         .
  11.750     62.9451    142.84  . Q      V.         .         .         .
  11.833     63.9390    144.31  . Q      V.         .         .         .
  11.917     64.9432    145.81  . Q      V.         .         .         .
  12.000     65.9580    147.35  . Q      V.         .         .         .
  12.083     66.9165    139.17  . Q       V         .         .         .
  12.167     67.7150    115.95  . Q       V         .         .         .
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      500.0    1000.0    1500.0    2000.0
-----------------------------------------------------------------------------
  12.250     68.4072    100.51  . Q       V         .         .         .
  12.333     69.0714     96.43  .Q        V         .         .         .
  12.417     69.7325     96.00  .Q        V         .         .         .
  12.500     70.3965     96.41  .Q        V         .         .         .
  12.583     71.0672     97.38  .Q        V         .         .         .
  12.667     71.7469     98.70  .Q        V         .         .         .
  12.750     72.4369    100.18  . Q       V         .         .         .
  12.833     73.1381    101.82  . Q       V         .         .         .
  12.917     73.8513    103.55  . Q       .V        .         .         .
  13.000     74.5774    105.44  . Q       .V        .         .         .
  13.083     75.3170    107.38  . Q       .V        .         .         .
  13.167     76.0705    109.41  . Q       .V        .         .         .
  13.250     76.8384    111.51  . Q       .V        .         .         .
  13.333     77.6217    113.73  . Q       .V        .         .         .
  13.417     78.4208    116.03  . Q       .V        .         .         .
  13.500     79.2368    118.48  . Q       .V        .         .         .
  13.583     80.0702    121.02  . Q       .V        .         .         .
  13.667     80.9223    123.72  . Q       . V       .         .         .
  13.750     81.7938    126.54  . Q       . V       .         .         .
  13.833     82.6860    129.55  . Q       . V       .         .         .
  13.917     83.5999    132.70  . Q       . V       .         .         .
  14.000     84.5372    136.09  . Q       . V       .         .         .
  14.083     85.4993    139.71  . Q       . V       .         .         .
  14.167     86.4892    143.73  . Q       . V       .         .         .
  14.250     87.5082    147.96  . Q       .  V      .         .         .
  14.333     88.5581    152.44  .  Q      .  V      .         .         .
  14.417     89.6403    157.14  .  Q      .  V      .         .         .
  14.500     90.7576    162.24  .  Q      .  V      .         .         .
  14.583     91.9124    167.67  .  Q      .  V      .         .         .
  14.667     93.1082    173.64  .  Q      .  V      .         .         .
  14.750     94.3484    180.07  .  Q      .   V     .         .         .
  14.833     95.6378    187.22  .  Q      .   V     .         .         .
  14.917     96.9809    195.01  .  Q      .   V     .         .         .
  15.000     98.3843    203.78  .   Q     .   V     .         .         .
  15.083     99.8545    213.47  .   Q     .   V     .         .         .
  15.167    101.4009    224.54  .   Q     .    V    .         .         .
  15.250    103.0332    237.01  .   Q     .    V    .         .         .
  15.333    104.7658    251.58  .    Q    .    V    .         .         .
  15.417    106.6192    269.11  .    Q    .    V    .         .         .
  15.500    108.6258    291.36  .    Q    .     V   .         .         .
  15.583    110.8129    317.56  .     Q   .     V   .         .         .
  15.667    113.2175    349.16  .     Q   .     V   .         .         .
  15.750    115.8935    388.55  .      Q  .      V  .         .         .
  15.833    118.9369    441.90  .       Q .      V  .         .         .
  15.917    122.5589    525.92  .         Q       V .         .         .
  16.000    127.2509    681.29  .         .  Q     V.         .         .
  16.083    135.5028   1198.18  .         .         V  Q       .         .
  16.167    148.6778   1913.01  .         .         . V        .       Q .
  16.250    161.1656   1813.22  .         .         .   V      .     Q   .
  16.333    169.8755   1264.68  .         .         .    Q     .         .
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      500.0    1000.0    1500.0    2000.0
-----------------------------------------------------------------------------
  16.417    175.6713    841.55  .          .     Q   .     V   .         .
  16.500    179.7711    595.29  .          .Q        .     V   .         .
  16.583    182.8331    444.61  .       Q .          .      V  .         .
  16.667    185.2501    350.95  .      Q  .          .      V  .         .
  16.750    187.2551    291.11  .    Q    .          .       V .         .
  16.833    188.9848    251.17  .    Q    .          .       V .         .
  16.917    190.5191    222.78  .   Q     .          .       V .         .
  17.000    191.8988    200.33  .   Q     .          .       V .         .
  17.083    193.1697    184.54  .  Q      .          .       V .         .
  17.167    194.3587    172.64  .  Q      .          .        V.         .
  17.250    195.4787    162.63  .  Q      .          .        V.         .
  17.333    196.5399    154.08  .  Q      .          .        V.         .
  17.417    197.5500    146.67  . Q       .          .        V.         .
  17.500    198.5152    140.15  . Q       .          .        V.         .
  17.583    199.4405    134.35  . Q       .          .        V.         .
  17.667    200.3300    129.15  . Q       .          .        V.         .
  17.750    201.1871    124.45  . Q       .          .         V         .
  17.833    202.0147    120.18  . Q       .          .         V         .
  17.917    202.8155    116.26  . Q       .          .         V         .
  18.000    203.5914    112.67  . Q       .          .         V         .
  18.083    204.3910    116.09  . Q       .          .         V         .
  18.167    205.3055    132.79  . Q       .          .         V         .
  18.250    206.3336    149.27  . Q       .          .         V         .
  18.333    207.4207    157.86  .  Q      .          .         .V        .
  18.417    208.5291    160.94  .  Q      .          .         .V        .
  18.500    209.6408    161.42  .  Q      .          .         .V        .
  18.583    210.7469    160.61  .  Q      .          .         .V        .
  18.667    211.8431    159.16  .  Q      .          .         .V        .
  18.750    212.9274    157.44  .  Q      .          .         .V        .
  18.833    213.9993    155.63  .  Q      .          .         . V       .
  18.917    215.0585    153.81  .  Q      .          .         . V       .
  19.000    216.1052    151.98  .  Q      .          .         . V       .
  19.083    217.1396    150.20  .  Q      .          .         . V       .
  19.167    218.1623    148.50  . Q       .          .         . V       .
  19.250    219.1738    146.86  . Q       .          .         . V       .
  19.333    220.1743    145.28  . Q       .          .         . V       .
  19.417    221.1644    143.76  . Q       .          .         .  V      .
  19.500    222.1445    142.30  . Q       .          .         .  V      .
  19.583    223.1148    140.89  . Q       .          .         .  V      .
  19.667    224.0758    139.53  . Q       .          .         .  V      .
  19.750    225.0277    138.22  . Q       .          .         .  V      .
  19.833    225.9708    136.95  . Q       .          .         .  V      .
  19.917    226.9055    135.72  . Q       .          .         .  V      .
  20.000    227.8320    134.52  . Q       .          .         .   V     .
  20.083    228.7505    133.37  . Q       .          .         .   V     .
  20.167    229.6613    132.25  . Q       .          .         .   V     .
  20.250    230.5646    131.16  . Q       .          .         .   V     .
  20.333    231.4606    130.10  . Q       .          .         .   V     .
  20.417    232.3496    129.08  . Q       .          .         .   V     .
  20.500    233.2317    128.08  . Q       .          .         .   V     .
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      500.0    1000.0    1500.0    2000.0
-----------------------------------------------------------------------------
  20.583    234.1071    127.11  . Q       .         .         .    V    .
  20.667    234.9761    126.17  . Q       .         .         .    V    .
  20.750    235.8387    125.25  . Q       .         .         .    V    .
  20.833    236.6951    124.35  . Q       .         .         .    V    .
  20.917    237.5455    123.48  . Q       .         .         .    V    .
  21.000    238.3900    122.63  . Q       .         .         .    V    .
  21.083    239.2288    121.80  . Q       .         .         .    V    .
  21.167    240.0620    120.98  . Q       .         .         .    V    .
  21.250    240.8898    120.19  . Q       .         .         .     V   .
  21.333    241.7122    119.42  . Q       .         .         .     V   .
  21.417    242.5295    118.66  . Q       .         .         .     V   .
  21.500    243.3416    117.92  . Q       .         .         .     V   .
  21.583    244.1488    117.20  . Q       .         .         .     V   .
  21.667    244.9510    116.49  . Q       .         .         .     V   .
  21.750    245.7486    115.80  . Q       .         .         .     V   .
  21.833    246.5414    115.12  . Q       .         .         .     V   .
  21.917    247.3297    114.46  . Q       .         .         .      V  .
  22.000    248.1134    113.81  . Q       .         .         .      V  .
  22.083    248.8929    113.17  . Q       .         .         .      V  .
  22.167    249.6680    112.54  . Q       .         .         .      V  .
  22.250    250.4388    111.93  . Q       .         .         .      V  .
  22.333    251.2056    111.33  . Q       .         .         .      V  .
  22.417    251.9683    110.74  . Q       .         .         .      V  .
  22.500    252.7270    110.17  . Q       .         .         .      V  .
  22.583    253.4818    109.60  . Q       .         .         .      V  .
  22.667    254.2328    109.04  . Q       .         .         .       V .
  22.750    254.9800    108.49  . Q       .         .         .       V .
  22.833    255.7235    107.96  . Q       .         .         .       V .
  22.917    256.4634    107.43  . Q       .         .         .       V .
  23.000    257.1997    106.91  . Q       .         .         .       V .
  23.083    257.9325    106.40  . Q       .         .         .       V .
  23.167    258.6618    105.90  . Q       .         .         .       V .
  23.250    259.3878    105.41  . Q       .         .         .       V .
  23.333    260.1104    104.92  . Q       .         .         .       V .
  23.417    260.8297    104.45  . Q       .         .         .        V.
  23.500    261.5458    103.98  . Q       .         .         .        V.
  23.583    262.2587    103.52  . Q       .         .         .        V.
  23.667    262.9685    103.06  . Q       .         .         .        V.
  23.750    263.6752    102.61  . Q       .         .         .        V.
  23.833    264.3789    102.17  . Q       .         .         .        V.
  23.917    265.0796    101.74  . Q       .         .         .        V.
  24.000    265.7773    101.32  . Q       .         .         .        V.
  24.083    266.4049     91.12  .Q        .         .         .        V.
  24.167    266.8324     62.07  .Q        .         .         .        V.
  24.250    267.0647     33.73  Q         .         .         .        V.
  24.333    267.1829     17.16  Q         .         .         .        V.
  24.417    267.2438      8.84  Q         .         .         .        V.
  24.500    267.2749      4.52  Q         .         .         .        V.
  24.583    267.2906      2.28  Q         .         .         .        V.
  24.667    267.2984      1.12  Q         .         .         .        V.
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      500.0    1000.0    1500.0    2000.0
-----------------------------------------------------------------------------
  24.750    267.3020      0.52  Q         .         .         .        V.
  24.833    267.3034      0.21  Q         .         .         .        V.
  24.917    267.3037      0.04  Q         .         .         .        V.
  25.000    267.3037      0.00  Q         .         .         .        V.
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****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    313.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #3)

         WATERCOURSE LENGTH =    5913.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    2837.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     286.000 FEET
         BASIN FACTOR = 0.030
         WATERSHED AREA =     238.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.207 HOURS
         * Instantaneous Unit-Hydrograph Option Selected.
          CAUTION: LAG TIME IS LESS THAN 0.75 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         S.C.S. S-GRAPH SELECTED
         WATERSHED RUNOFF CURVE NUMBER =  85.00

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.77
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.45
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.86
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.74
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  8.00
         24-HOUR NESTED DESIGN STORM DISTRIBUTION SELECTED
         (Ref: San Diego County Hydrology Manual)

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.996
          30-MINUTE FACTOR = 0.996
           1-HOUR FACTOR = 0.998
           3-HOUR FACTOR = 0.999
           6-HOUR FACTOR = 0.999
          24-HOUR FACTOR = 0.999

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  40.242


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL       "q/qp" GRAPH          UNIT HYDROGRAPH
     NUMBER               VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 0.417                421.211
        2                 0.993               1003.648
        3                 0.780                787.646
        4                 0.350                353.280
        5                 0.167                168.514
        6                 0.077                 77.703
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        7                 0.036                 36.654
        8                 0.017                 17.142
        9                 0.009                  8.674
       10                 0.003                  3.354
       11                 0.000                  0.000



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         TOTAL STORM RAINFALL(INCHES) =  7.99
         TOTAL SOIL-LOSS(INCHES) =  1.79
         TOTAL EFFECTIVE RAINFALL(INCHES) =  6.21

-----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      35.5078
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     123.0307
-----------------------------------------------------------------------------
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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	250.0	500.0	750.0	1000.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0000	0.00	Q	.	.	.	.
0.833	0.0000	0.00	Q	.	.	.	.
0.917	0.0000	0.00	Q	.	.	.	.
1.000	0.0000	0.00	Q	.	.	.	.
1.083	0.0000	0.00	Q	.	.	.	.
1.167	0.0000	0.00	Q	.	.	.	.
1.250	0.0000	0.00	Q	.	.	.	.
1.333	0.0000	0.00	Q	.	.	.	.
1.417	0.0000	0.00	Q	.	.	.	.
1.500	0.0000	0.00	Q	.	.	.	.
1.583	0.0000	0.00	Q	.	.	.	.
1.667	0.0000	0.00	Q	.	.	.	.
1.750	0.0000	0.00	Q	.	.	.	.
1.833	0.0007	0.10	Q	.	.	.	.
1.917	0.0039	0.46	Q	.	.	.	.
2.000	0.0115	1.10	Q	.	.	.	.
2.083	0.0246	1.90	Q	.	.	.	.
2.167	0.0436	2.76	Q	.	.	.	.
2.250	0.0687	3.64	Q	.	.	.	.
2.333	0.0998	4.52	Q	.	.	.	.
2.417	0.1369	5.39	Q	.	.	.	.
2.500	0.1799	6.24	Q	.	.	.	.
2.583	0.2287	7.08	Q	.	.	.	.
2.667	0.2831	7.90	Q	.	.	.	.
2.750	0.3431	8.71	Q	.	.	.	.
2.833	0.4085	9.50	Q	.	.	.	.
2.917	0.4793	10.28	Q	.	.	.	.
3.000	0.5553	11.04	Q	.	.	.	.
3.083	0.6364	11.79	Q	.	.	.	.
3.167	0.7227	12.52	Q	.	.	.	.
3.250	0.8139	13.24	Q	.	.	.	.
3.333	0.9100	13.95	Q	.	.	.	.
3.417	1.0109	14.65	Q	.	.	.	.
3.500	1.1165	15.34	Q	.	.	.	.
3.583	1.2268	16.01	Q	.	.	.	.
3.667	1.3416	16.67	Q	.	.	.	.
3.750	1.4609	17.33	Q	.	.	.	.
3.833	1.5847	17.97	Q	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	250.0	500.0	750.0	1000.0
3.917	1.7128	18.61	Q	.	.	.	.
4.000	1.8453	19.23	Q	.	.	.	.
4.083	1.9820	19.85	Q	.	.	.	.
4.167	2.1228	20.45	Q	.	.	.	.
4.250	2.2678	21.05	Q	.	.	.	.
4.333	2.4168	21.64	Q	.	.	.	.
4.417	2.5699	22.22	Q	.	.	.	.
4.500	2.7269	22.80	Q	.	.	.	.
4.583	2.8878	23.36	Q	.	.	.	.
4.667	3.0526	23.92	Q	.	.	.	.
4.750	3.2211	24.48	QV	.	.	.	.
4.833	3.3935	25.03	.Q	.	.	.	.
4.917	3.5696	25.57	.Q	.	.	.	.
5.000	3.7493	26.10	.Q	.	.	.	.
5.083	3.9327	26.63	.Q	.	.	.	.
5.167	4.1197	27.15	.Q	.	.	.	.
5.250	4.3103	27.67	.Q	.	.	.	.
5.333	4.5044	28.19	.Q	.	.	.	.
5.417	4.7020	28.69	.Q	.	.	.	.
5.500	4.9031	29.20	.Q	.	.	.	.
5.583	5.1076	29.69	.Q	.	.	.	.
5.667	5.3155	30.19	.Q	.	.	.	.
5.750	5.5268	30.68	.Q	.	.	.	.
5.833	5.7415	31.17	.Q	.	.	.	.
5.917	5.9594	31.65	.Q	.	.	.	.
6.000	6.1807	32.13	.QV	.	.	.	.
6.083	6.4052	32.60	.QV	.	.	.	.
6.167	6.6330	33.08	.QV	.	.	.	.
6.250	6.8641	33.54	.QV	.	.	.	.
6.333	7.0983	34.01	.QV	.	.	.	.
6.417	7.3357	34.47	.QV	.	.	.	.
6.500	7.5763	34.94	.QV	.	.	.	.
6.583	7.8201	35.39	.QV	.	.	.	.
6.667	8.0670	35.85	.QV	.	.	.	.
6.750	8.3170	36.30	.QV	.	.	.	.
6.833	8.5702	36.76	.QV	.	.	.	.
6.917	8.8264	37.21	.QV	.	.	.	.
7.000	9.0857	37.66	.QV	.	.	.	.
7.083	9.3482	38.10	.Q V	.	.	.	.
7.167	9.6136	38.55	.Q V	.	.	.	.
7.250	9.8822	38.99	.Q V	.	.	.	.
7.333	10.1538	39.44	.Q V	.	.	.	.
7.417	10.4285	39.88	.Q V	.	.	.	.
7.500	10.7062	40.32	.Q V	.	.	.	.
7.583	10.9869	40.76	.Q V	.	.	.	.
7.667	11.2707	41.20	.Q V	.	.	.	.
7.750	11.5575	41.65	.Q V	.	.	.	.
7.833	11.8474	42.09	.Q V	.	.	.	.
7.917	12.1403	42.53	.Q V	.	.	.	.
8.000	12.4362	42.97	.Q V	.	.	.	.

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      250.0     500.0     750.0    1000.0
-----------------------------------------------------------------------------
   8.083     12.7351     43.41  .Q  V     .         .         .         .
   8.167     13.0371     43.85  .Q  V     .         .         .         .
   8.250     13.3422     44.29  .Q  V     .         .         .         .
   8.333     13.6503     44.74  .Q  V     .         .         .         .
   8.417     13.9615     45.18  .Q  V     .         .         .         .
   8.500     14.2757     45.63  .Q  V     .         .         .         .
   8.583     14.5930     46.07  .Q  V     .         .         .         .
   8.667     14.9134     46.52  .Q  V     .         .         .         .
   8.750     15.2368     46.97  .Q  V     .         .         .         .
   8.833     15.5634     47.42  .Q   V    .         .         .         .
   8.917     15.8931     47.87  .Q   V    .         .         .         .
   9.000     16.2259     48.33  .Q   V    .         .         .         .
   9.083     16.5619     48.78  .Q   V    .         .         .         .
   9.167     16.9011     49.24  .Q   V    .         .         .         .
   9.250     17.2434     49.71  .Q   V    .         .         .         .
   9.333     17.5889     50.17  . Q  V    .         .         .         .
   9.417     17.9377     50.64  . Q  V    .         .         .         .
   9.500     18.2897     51.11  . Q  V    .         .         .         .
   9.583     18.6450     51.59  . Q   V   .         .         .         .
   9.667     19.0035     52.06  . Q   V   .         .         .         .
   9.750     19.3654     52.55  . Q   V   .         .         .         .
   9.833     19.7307     53.03  . Q   V   .         .         .         .
   9.917     20.0993     53.52  . Q   V   .         .         .         .
  10.000     20.4713     54.02  . Q   V   .         .         .         .
  10.083     20.8468     54.52  . Q   V   .         .         .         .
  10.167     21.2257     55.02  . Q   V   .         .         .         .
  10.250     21.6082     55.53  . Q    V  .         .         .         .
  10.333     21.9942     56.05  . Q    V  .         .         .         .
  10.417     22.3838     56.57  . Q    V  .         .         .         .
  10.500     22.7771     57.10  . Q    V  .         .         .         .
  10.583     23.1740     57.63  . Q    V  .         .         .         .
  10.667     23.5747     58.18  . Q    V  .         .         .         .
  10.750     23.9791     58.73  . Q    V  .         .         .         .
  10.833     24.3874     59.28  . Q    V  .         .         .         .
  10.917     24.7996     59.85  . Q     V .         .         .         .
  11.000     25.2157     60.42  . Q     V .         .         .         .
  11.083     25.6358     61.00  . Q     V .         .         .         .
  11.167     26.0600     61.59  . Q     V .         .         .         .
  11.250     26.4883     62.19  . Q     V .         .         .         .
  11.333     26.9208     62.80  . Q     V .         .         .         .
  11.417     27.3576     63.42  . Q     V .         .         .         .
  11.500     27.7988     64.05  . Q      V.         .         .         .
  11.583     28.2443     64.70  . Q      V.         .         .         .
  11.667     28.6944     65.35  . Q      V.         .         .         .
  11.750     29.1491     66.02  . Q      V.         .         .         .
  11.833     29.6085     66.70  . Q      V.         .         .         .
  11.917     30.0727     67.40  . Q      V.         .         .         .
  12.000     30.5418     68.11  . Q      V.         .         .         .
  12.083     30.9696     62.11  . Q       V         .         .         .
  12.167     31.3099     49.41  .Q        V         .         .         .
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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      250.0     500.0     750.0    1000.0
-----------------------------------------------------------------------------
  12.250     31.6108     43.70  .Q        V         .         .         .
  12.333     31.9110     43.58  .Q        V         .         .         .
  12.417     32.2123     43.75  .Q        V         .         .         .
  12.500     32.5170     44.24  .Q        V         .         .         .
  12.583     32.8258     44.85  .Q        V         .         .         .
  12.667     33.1395     45.55  .Q        V         .         .         .
  12.750     33.4583     46.28  .Q        V         .         .         .
  12.833     33.7826     47.09  .Q        V         .         .         .
  12.917     34.1127     47.94  .Q        .V        .         .         .
  13.000     34.4489     48.81  .Q        .V        .         .         .
  13.083     34.7913     49.72  .Q        .V        .         .         .
  13.167     35.1403     50.67  . Q       .V        .         .         .
  13.250     35.4960     51.66  . Q       .V        .         .         .
  13.333     35.8589     52.70  . Q       .V        .         .         .
  13.417     36.2293     53.78  . Q       .V        .         .         .
  13.500     36.6076     54.93  . Q       .V        .         .         .
  13.583     36.9941     56.12  . Q       . V       .         .         .
  13.667     37.3894     57.39  . Q       . V       .         .         .
  13.750     37.7939     58.73  . Q       . V       .         .         .
  13.833     38.2081     60.14  . Q       . V       .         .         .
  13.917     38.6325     61.63  . Q       . V       .         .         .
  14.000     39.0679     63.22  . Q       . V       .         .         .
  14.083     39.5151     64.93  . Q       . V       .         .         .
  14.167     39.9750     66.78  . Q       . V       .         .         .
  14.250     40.4485     68.74  . Q       .  V      .         .         .
  14.333     40.9362     70.83  . Q       .  V      .         .         .
  14.417     41.4393     73.05  . Q       .  V      .         .         .
  14.500     41.9590     75.45  .  Q      .  V      .         .         .
  14.583     42.4965     78.05  .  Q      .  V      .         .         .
  14.667     43.0535     80.88  .  Q      .  V      .         .         .
  14.750     43.6318     83.97  .  Q      .   V     .         .         .
  14.833     44.2335     87.37  .  Q      .   V     .         .         .
  14.917     44.8611     91.12  .  Q      .   V     .         .         .
  15.000     45.5176     95.32  .  Q      .   V     .         .         .
  15.083     46.2064    100.01  .   Q     .    V    .         .         .
  15.167     46.9319    105.34  .   Q     .    V    .         .         .
  15.250     47.6992    111.41  .   Q     .    V    .         .         .
  15.333     48.5151    118.47  .   Q     .    V    .         .         .
  15.417     49.3895    126.97  .    Q    .     V   .         .         .
  15.500     50.3358    137.40  .    Q    .     V   .         .         .
  15.583     51.3682    149.91  .    Q    .     V   .         .         .
  15.667     52.5069    165.34  .     Q   .      V  .         .         .
  15.750     53.7845    185.51  .      Q  .      V  .         .         .
  15.833     55.2532    213.25  .       Q .      V  .         .         .
  15.917     57.0374    259.06  .         Q       V .         .         .
  16.000     59.4081    344.24  .          .  Q     V.         .         .
  16.083     63.9661    661.82  .          .         V     Q   .         .
  16.167     70.7994    992.19  .          .          .  V      .        Q.
  16.250     76.3938    812.32  .          .          .   V     . Q       .
  16.333     79.7925    493.49  .          .        Q.    V    .         .
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      250.0     500.0     750.0    1000.0
-----------------------------------------------------------------------------
  16.417     82.0357    325.70  .          .  Q      .     V   .         .
  16.500     83.6136    229.11  .        Q.          .      V  .         .
  16.583     84.8150    174.45  .     Q   .          .      V  .         .
  16.667     85.7893    141.47  .    Q    .          .      V  .         .
  16.750     86.6209    120.75  .   Q     .          .       V .         .
  16.833     87.3500    105.85  .   Q     .          .       V .         .
  16.917     88.0036     94.91  .  Q      .          .       V .         .
  17.000     88.6081     87.78  .  Q      .          .       V .         .
  17.083     89.1726     81.96  .  Q      .          .       V .         .
  17.167     89.7032     77.04  .  Q      .          .        V.         .
  17.250     90.2048     72.84  . Q       .          .        V.         .
  17.333     90.6815     69.20  . Q       .          .        V.         .
  17.417     91.1361     66.02  . Q       .          .        V.         .
  17.500     91.5713     63.19  . Q       .          .        V.         .
  17.583     91.9890     60.66  . Q       .          .        V.         .
  17.667     92.3910     58.37  . Q       .          .         V         .
  17.750     92.7788     56.30  . Q       .          .         V         .
  17.833     93.1535     54.41  . Q       .          .         V         .
  17.917     93.5163     52.68  . Q       .          .         V         .
  18.000     93.8681     51.08  . Q       .          .         V         .
  18.083     94.2418     54.27  . Q       .          .         V         .
  18.167     94.6826     64.00  . Q       .          .         V         .
  18.250     95.1744     71.41  . Q       .          .         V         .
  18.333     95.6846     74.09  . Q       .          .         .V        .
  18.417     96.1996     74.78  . Q       .          .         .V        .
  18.500     96.7129     74.52  . Q       .          .         .V        .
  18.583     97.2216     73.87  . Q       .          .         .V        .
  18.667     97.7248     73.05  . Q       .          .         .V        .
  18.750     98.2219     72.19  . Q       .          .         .V        .
  18.833     98.7130     71.31  . Q       .          .         . V       .
  18.917     99.1981     70.43  . Q       .          .         . V       .
  19.000     99.6774     69.59  . Q       .          .         . V       .
  19.083    100.1511     68.79  . Q       .          .         . V       .
  19.167    100.6195     68.01  . Q       .          .         . V       .
  19.250    101.0828     67.27  . Q       .          .         . V       .
  19.333    101.5412     66.56  . Q       .          .         .  V      .
  19.417    101.9949     65.87  . Q       .          .         .  V      .
  19.500    102.4440     65.21  . Q       .          .         .  V      .
  19.583    102.8886     64.57  . Q       .          .         .  V      .
  19.667    103.3291     63.95  . Q       .          .         .  V      .
  19.750    103.7654     63.35  . Q       .          .         .  V      .
  19.833    104.1977     62.77  . Q       .          .         .  V      .
  19.917    104.6262     62.21  . Q       .          .         .   V     .
  20.000    105.0509     61.67  . Q       .          .         .   V     .
  20.083    105.4720     61.15  . Q       .          .         .   V     .
  20.167    105.8896     60.64  . Q       .          .         .   V     .
  20.250    106.3038     60.14  . Q       .          .         .   V     .
  20.333    106.7147     59.66  . Q       .          .         .   V     .
  20.417    107.1224     59.19  . Q       .          .         .   V     .
  20.500    107.5269     58.74  . Q       .          .         .   V     .
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      250.0     500.0     750.0    1000.0
-----------------------------------------------------------------------------
  20.583    107.9284     58.30  . Q       .         .         .    V    .
  20.667    108.3270     57.87  . Q       .         .         .    V    .
  20.750    108.7226     57.45  . Q       .         .         .    V    .
  20.833    109.1154     57.04  . Q       .         .         .    V    .
  20.917    109.5055     56.64  . Q       .         .         .    V    .
  21.000    109.8929     56.25  . Q       .         .         .    V    .
  21.083    110.2777     55.87  . Q       .         .         .    V    .
  21.167    110.6599     55.50  . Q       .         .         .    V    .
  21.250    111.0397     55.14  . Q       .         .         .     V   .
  21.333    111.4170     54.79  . Q       .         .         .     V   .
  21.417    111.7919     54.44  . Q       .         .         .     V   .
  21.500    112.1645     54.10  . Q       .         .         .     V   .
  21.583    112.5349     53.77  . Q       .         .         .     V   .
  21.667    112.9030     53.45  . Q       .         .         .     V   .
  21.750    113.2689     53.13  . Q       .         .         .     V   .
  21.833    113.6327     52.82  . Q       .         .         .     V   .
  21.917    113.9944     52.52  . Q       .         .         .      V  .
  22.000    114.3540     52.22  . Q       .         .         .      V  .
  22.083    114.7117     51.93  . Q       .         .         .      V  .
  22.167    115.0674     51.64  . Q       .         .         .      V  .
  22.250    115.4211     51.36  . Q       .         .         .      V  .
  22.333    115.7730     51.09  . Q       .         .         .      V  .
  22.417    116.1230     50.82  . Q       .         .         .      V  .
  22.500    116.4712     50.56  . Q       .         .         .      V  .
  22.583    116.8176     50.30  . Q       .         .         .      V  .
  22.667    117.1622     50.04  . Q       .         .         .       V .
  22.750    117.5051     49.79  .Q        .         .         .       V .
  22.833    117.8463     49.54  .Q        .         .         .       V .
  22.917    118.1859     49.30  .Q        .         .         .       V .
  23.000    118.5238     49.06  .Q        .         .         .       V .
  23.083    118.8601     48.83  .Q        .         .         .       V .
  23.167    119.1948     48.60  .Q        .         .         .       V .
  23.250    119.5280     48.38  .Q        .         .         .       V .
  23.333    119.8596     48.15  .Q        .         .         .       V .
  23.417    120.1898     47.94  .Q        .         .         .        V.
  23.500    120.5184     47.72  .Q        .         .         .        V.
  23.583    120.8456     47.51  .Q        .         .         .        V.
  23.667    121.1714     47.30  .Q        .         .         .        V.
  23.750    121.4957     47.10  .Q        .         .         .        V.
  23.833    121.8187     46.89  .Q        .         .         .        V.
  23.917    122.1403     46.70  .Q        .         .         .        V.
  24.000    122.4605     46.50  .Q        .         .         .        V.
  24.083    122.7331     39.58  .Q        .         .         .        V.
  24.167    122.8942     23.39  Q         .         .         .        V.
  24.250    122.9679     10.71  Q         .         .         .        V.
  24.333    123.0025      5.02  Q         .         .         .        V.
  24.417    123.0184      2.31  Q         .         .         .        V.
  24.500    123.0257      1.06  Q         .         .         .        V.
  24.583    123.0289      0.47  Q         .         .         .        V.
  24.667    123.0303      0.19  Q         .         .         .        V.
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      250.0     500.0     750.0    1000.0
-----------------------------------------------------------------------------
  24.750    123.0306      0.05  Q         .         .         .        V.
  24.833    123.0306      0.00  Q         .         .         .        V.
=============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

POST-DEVELOPMENT CONDITIONS

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

              F L O O D   R O U T I N G    A N A L Y S I S

                     ACCORDING TO COUNTY OF SAN DIEGO
  DEPARTMENT OF PUBLIC WORKS FLOOD CONTROL DIVISION HYDROLOGY MANUAL(2003)
         (c) Copyright 1989-2004 Advanced Engineering Software (aes)
             Ver. 10.0  Release Date: 01/01/2004  License ID 1503

                           Analysis prepared by:

                            LANDMARK CONSULTING
                        9555 GENESEE AVE. SUITE 200
                            SAN DIEGO, CA 92121
                   TEL:  858-587-8070, FAX:  858-587-8750

 ************************** DESCRIPTION OF STUDY **************************
* LILAC HILLS RANCH                                                        *
* PRELIMINARY HYDROGRAPH                                                   *
* POST-DEVELOPMENT, 100-YEAR STORM                                         *
 ****************************************************************************

  FILE NAME: 1037PH.DAT
  TIME/DATE OF STUDY: 10:22 02/17/2012
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERCOURSE LENGTH =    8765.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    4800.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     510.000 FEET
         BASIN FACTOR = 0.015
         WATERSHED AREA =     644.000 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.142 HOURS
         * Instantaneous Unit-Hydrograph Option Selected.
          CAUTION: LAG TIME IS LESS THAN 0.75 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         S.C.S. S-GRAPH SELECTED
         WATERSHED RUNOFF CURVE NUMBER =  86.00

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.77
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.45
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.86
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.74
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  8.00
         24-HOUR NESTED DESIGN STORM DISTRIBUTION SELECTED
         (Ref: San Diego County Hydrology Manual)

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.988
          30-MINUTE FACTOR = 0.988
           1-HOUR FACTOR = 0.994
           3-HOUR FACTOR = 0.996
           6-HOUR FACTOR = 0.997
          24-HOUR FACTOR = 0.998

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  58.778


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL       "q/qp" GRAPH          UNIT HYDROGRAPH
     NUMBER               VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 0.791               3151.678
        2                 0.809               3224.010
        3                 0.263               1049.593
        4                 0.088                350.278
        5                 0.029                114.103
        6                 0.010                 39.483
```

```
        7                 0.002                  9.054
        8                 0.000                  0.000



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

         TOTAL STORM RAINFALL(INCHES) =  7.98
         TOTAL SOIL-LOSS(INCHES) =  1.67
         TOTAL EFFECTIVE RAINFALL(INCHES) =  6.32

--------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      89.5220
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     345.2892
--------------------------------------------------------------------------
```

==========

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	775.0	1550.0	2325.0	3100.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0000	0.00	Q	.	.	.	.
0.833	0.0000	0.00	Q	.	.	.	.
0.917	0.0000	0.00	Q	.	.	.	.
1.000	0.0000	0.00	Q	.	.	.	.
1.083	0.0000	0.00	Q	.	.	.	.
1.167	0.0000	0.00	Q	.	.	.	.
1.250	0.0000	0.00	Q	.	.	.	.
1.333	0.0000	0.00	Q	.	.	.	.
1.417	0.0000	0.00	Q	.	.	.	.
1.500	0.0000	0.00	Q	.	.	.	.
1.583	0.0000	0.00	Q	.	.	.	.
1.667	0.0022	0.31	Q	.	.	.	.
1.750	0.0141	1.73	Q	.	.	.	.
1.833	0.0421	4.06	Q	.	.	.	.
1.917	0.0881	6.68	Q	.	.	.	.
2.000	0.1524	9.34	Q	.	.	.	.
2.083	0.2349	11.98	Q	.	.	.	.
2.167	0.3352	14.56	Q	.	.	.	.
2.250	0.4530	17.10	Q	.	.	.	.
2.333	0.5877	19.57	Q	.	.	.	.
2.417	0.7392	22.00	Q	.	.	.	.
2.500	0.9070	24.36	Q	.	.	.	.
2.583	1.0908	26.68	Q	.	.	.	.
2.667	1.2902	28.95	Q	.	.	.	.
2.750	1.5049	31.18	Q	.	.	.	.
2.833	1.7347	33.36	Q	.	.	.	.
2.917	1.9791	35.49	Q	.	.	.	.
3.000	2.2380	37.59	Q	.	.	.	.
3.083	2.5110	39.64	Q	.	.	.	.
3.167	2.7979	41.66	Q	.	.	.	.
3.250	3.0984	43.64	Q	.	.	.	.
3.333	3.4123	45.58	Q	.	.	.	.
3.417	3.7393	47.49	Q	.	.	.	.
3.500	4.0793	49.36	Q	.	.	.	.
3.583	4.4319	51.20	Q	.	.	.	.
3.667	4.7970	53.01	Q	.	.	.	.
3.750	5.1744	54.80	Q	.	.	.	.
3.833	5.5638	56.54	Q	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 775.0 1550.0 2325.0 3100.0
3.917	5.9651	58.27	Q . . . .
4.000	6.3781	59.97	Q . . . .
4.083	6.8027	61.64	Q . . . .
4.167	7.2385	63.29	Q . . . .
4.250	7.6856	64.92	Q . . . .
4.333	8.1437	66.51	Q . . . .
4.417	8.6126	68.10	Q . . . .
4.500	9.0923	69.65	QV . . . .
4.583	9.5826	71.19	QV . . . .
4.667	10.0833	72.70	QV . . . .
4.750	10.5943	74.20	QV . . . .
4.833	11.1155	75.68	QV . . . .
4.917	11.6468	77.15	QV . . . .
5.000	12.1880	78.58	.Q . . . .
5.083	12.7391	80.02	.Q . . . .
5.167	13.2999	81.43	.Q . . . .
5.250	13.8704	82.83	.Q . . . .
5.333	14.4503	84.21	.Q . . . .
5.417	15.0398	85.59	.Q . . . .
5.500	15.6385	86.94	.Q . . . .
5.583	16.2466	88.29	.Q . . . .
5.667	16.8638	89.62	.Q . . . .
5.750	17.4901	90.95	.QV . . . .
5.833	18.1255	92.25	.QV . . . .
5.917	18.7698	93.56	.QV . . . .
6.000	19.4230	94.84	.QV . . . .
6.083	20.0850	96.13	.QV . . . .
6.167	20.7558	97.39	.QV . . . .
6.250	21.4353	98.67	.QV . . . .
6.333	22.1235	99.92	.QV . . . .
6.417	22.8203	101.18	.QV . . . .
6.500	23.5255	102.41	.QV . . . .
6.583	24.2394	103.65	.QV . . . .
6.667	24.9617	104.87	.QV . . . .
6.750	25.6925	106.11	.QV . . . .
6.833	26.4316	107.32	.Q V . . . .
6.917	27.1791	108.54	.Q V . . . .
7.000	27.9349	109.74	.Q V . . . .
7.083	28.6991	110.96	.Q V . . . .
7.167	29.4715	112.15	.Q V . . . .
7.250	30.2522	113.36	.Q V . . . .
7.333	31.0411	114.55	.Q V . . . .
7.417	31.8384	115.76	.Q V . . . .
7.500	32.6437	116.94	.Q V . . . .
7.583	33.4574	118.14	.Q V . . . .
7.667	34.2792	119.32	.Q V . . . .
7.750	35.1093	120.53	.Q V . . . .
7.833	35.9475	121.71	.Q V . . . .
7.917	36.7940	122.91	.Q V . . . .
8.000	37.6486	124.09	.Q V . . . .

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      775.0    1550.0    2325.0    3100.0
-----------------------------------------------------------------------------
   8.083     38.5116    125.30  .Q  V     .         .         .         .
   8.167     39.3827    126.48  .Q  V     .         .         .         .
   8.250     40.2621    127.70  .Q  V     .         .         .         .
   8.333     41.1497    128.88  .Q  V     .         .         .         .
   8.417     42.0457    130.10  .Q  V     .         .         .         .
   8.500     42.9499    131.29  .Q  V     .         .         .         .
   8.583     43.8626    132.52  .Q   V    .         .         .         .
   8.667     44.7835    133.72  .Q   V    .         .         .         .
   8.750     45.7130    134.96  .Q   V    .         .         .         .
   8.833     46.6507    136.16  .Q   V    .         .         .         .
   8.917     47.5971    137.41  .Q   V    .         .         .         .
   9.000     48.5518    138.63  .Q   V    .         .         .         .
   9.083     49.5153    139.90  .Q   V    .         .         .         .
   9.167     50.4873    141.13  .Q   V    .         .         .         .
   9.250     51.4681    142.41  .Q   V    .         .         .         .
   9.333     52.4574    143.66  .Q    V   .         .         .         .
   9.417     53.4558    144.96  .Q    V   .         .         .         .
   9.500     54.4628    146.22  .Q    V   .         .         .         .
   9.583     55.4789    147.54  .Q    V   .         .         .         .
   9.667     56.5039    148.83  .Q    V   .         .         .         .
   9.750     57.5381    150.17  .Q    V   .         .         .         .
   9.833     58.5813    151.48  .Q    V   .         .         .         .
   9.917     59.6340    152.85  .Q    V   .         .         .         .
  10.000     60.6958    154.18  .Q     V  .         .         .         .
  10.083     61.7673    155.58  . Q    V  .         .         .         .
  10.167     62.8481    156.93  . Q    V  .         .         .         .
  10.250     63.9388    158.36  . Q    V  .         .         .         .
  10.333     65.0390    159.75  . Q    V  .         .         .         .
  10.417     66.1493    161.22  . Q    V  .         .         .         .
  10.500     67.2695    162.64  . Q    V  .         .         .         .
  10.583     68.3999    164.15  . Q    V  .         .         .         .
  10.667     69.5405    165.61  . Q     V .         .         .         .
  10.750     70.6917    167.15  . Q     V .         .         .         .
  10.833     71.8532    168.66  . Q     V .         .         .         .
  10.917     73.0257    170.25  . Q     V .         .         .         .
  11.000     74.2089    171.79  . Q     V .         .         .         .
  11.083     75.4034    173.44  . Q     V .         .         .         .
  11.167     76.6089    175.04  . Q     V .         .         .         .
  11.250     77.8261    176.74  . Q      V.         .         .         .
  11.333     79.0547    178.39  . Q      V.         .         .         .
  11.417     80.2954    180.15  . Q      V.         .         .         .
  11.500     81.5479    181.87  . Q      V.         .         .         .
  11.583     82.8131    183.70  . Q      V.         .         .         .
  11.667     84.0905    185.48  . Q      V.         .         .         .
  11.750     85.3810    187.39  . Q      V.         .         .         .
  11.833     86.6843    189.24  . Q       V         .         .         .
  11.917     88.0014    191.23  . Q       V         .         .         .
  12.000     89.3317    193.17  . Q       V         .         .         .
  12.083     90.3248    144.19  .Q        V         .         .         .
  12.167     91.1069    113.57  .Q        V         .         .         .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      775.0    1550.0    2325.0    3100.0
-----------------------------------------------------------------------------
  12.250     91.9241    118.65  .Q        V         .         .         .
  12.333     92.7598    121.35  .Q        V         .         .         .
  12.417     93.6114    123.66  .Q        V         .         .         .
  12.500     94.4767    125.64  .Q        V         .         .         .
  12.583     95.3573    127.86  .Q        .V        .         .         .
  12.667     96.2524    129.97  .Q        .V        .         .         .
  12.750     97.1633    132.25  .Q        .V        .         .         .
  12.833     98.0894    134.48  .Q        .V        .         .         .
  12.917     99.0326    136.95  .Q        .V        .         .         .
  13.000     99.9925    139.38  .Q        .V        .         .         .
  13.083    100.9710    142.07  .Q        .V        .         .         .
  13.167    101.9676    144.71  .Q        .V        .         .         .
  13.250    102.9846    147.67  .Q        .V        .         .         .
  13.333    104.0216    150.56  .Q        . V       .         .         .
  13.417    105.0809    153.81  .Q        . V       .         .         .
  13.500    106.1622    157.01  . Q       . V       .         .         .
  13.583    107.2683    160.61  . Q       . V       .         .         .
  13.667    108.3989    164.16  . Q       . V       .         .         .
  13.750    109.5571    168.17  . Q       . V       .         .         .
  13.833    110.7426    172.14  . Q       . V       .         .         .
  13.917    111.9592    176.65  . Q       . V       .         .         .
  14.000    113.2067    181.13  . Q       .  V      .         .         .
  14.083    114.4923    186.67  . Q       .  V      .         .         .
  14.167    115.8159    192.20  . Q       .  V      .         .         .
  14.250    117.1808    198.18  . Q       .  V      .         .         .
  14.333    118.5863    204.07  . Q       .  V      .         .         .
  14.417    120.0386    210.87  . Q       .  V      .         .         .
  14.500    121.5378    217.69  . Q       .   V     .         .         .
  14.583    123.0922    225.69  . Q       .   V     .         .         .
  14.667    124.7023    233.79  .  Q      .   V     .         .         .
  14.750    126.3786    243.39  .  Q      .   V     .         .         .
  14.833    128.1224    253.20  .  Q      .   V     .         .         .
  14.917    129.9475    265.01  .  Q      .    V    .         .         .
  15.000    131.8566    277.19  .  Q      .    V    .         .         .
  15.083    133.8687    292.17  .  Q      .    V    .         .         .
  15.167    135.9887    307.82  .  Q      .    V    .         .         .
  15.250    138.2448    327.58  .   Q     .     V   .         .         .
  15.333    140.6458    348.64  .   Q     .     V   .         .         .
  15.417    143.2677    380.69  .   Q     .     V   .         .         .
  15.500    146.1273    415.22  .    Q    .     V   .         .         .
  15.583    149.2817    458.01  .    Q    .      V  .         .         .
  15.667    152.7655    505.85  .     Q   .      V  .         .         .
  15.750    156.7349    576.36  .      Q  .       V .         .         .
  15.833    161.3260    666.62  .       Q .       V .         .         .
  15.917    167.2669    862.63  .         .Q       V.         .         .
  16.000    175.5782   1206.79  .         .    Q    V         .         .
  16.083    196.7370   3072.25  .         .         . V        .        Q.
  16.167    216.8982   2927.42  .         .         .    V     .      Q  .
  16.250    226.8885   1450.60  .         .       Q .     V   .         .
  16.333    232.6972    843.42  .         Q         .     V   .         .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      775.0    1550.0    2325.0    3100.0
-----------------------------------------------------------------------------
  16.417    236.6255    570.38  .       Q  .         .      V  .         .
  16.500    239.6380    437.42  .    Q     .         .      V  .         .
  16.583    242.1268    361.37  .   Q      .         .       V .         .
  16.667    244.2998    315.53  .   Q      .         .       V .         .
  16.750    246.2663    285.53  .  Q       .         .       V .         .
  16.833    248.0724    262.26  .  Q       .         .       V .         .
  16.917    249.7493    243.49  .  Q       .         .       V .         .
  17.000    251.3190    227.92  . Q        .         .        V.         .
  17.083    252.7947    214.27  . Q        .         .        V.         .
  17.167    254.1889    202.43  . Q        .         .        V.         .
  17.250    255.5136    192.35  . Q        .         .        V.         .
  17.333    256.7776    183.53  . Q        .         .        V.         .
  17.417    257.9878    175.72  . Q        .         .        V.         .
  17.500    259.1498    168.72  . Q        .         .         V         .
  17.583    260.2683    162.41  . Q        .         .         V         .
  17.667    261.3474    156.68  . Q        .         .         V         .
  17.750    262.3905    151.45  .Q         .         .         V         .
  17.833    263.4005    146.65  .Q         .         .         V         .
  17.917    264.3801    142.23  .Q         .         .         V         .
  18.000    265.3314    138.14  .Q         .         .         V         .
  18.083    266.4969    169.23  . Q        .         .         V         .
  18.167    267.8834    201.32  . Q        .         .         .V        .
  18.250    269.3262    209.50  . Q        .         .         .V        .
  18.333    270.7732    210.11  . Q        .         .         .V        .
  18.417    272.2076    208.27  . Q        .         .         .V        .
  18.500    273.6246    205.76  . Q        .         .         .V        .
  18.583    275.0230    203.05  . Q        .         .         .V        .
  18.667    276.4031    200.38  . Q        .         .         . V       .
  18.750    277.7655    197.83  . Q        .         .         . V       .
  18.833    279.1112    195.39  . Q        .         .         . V       .
  18.917    280.4408    193.06  . Q        .         .         . V       .
  19.000    281.7550    190.82  . Q        .         .         . V       .
  19.083    283.0544    188.67  . Q        .         .         . V       .
  19.167    284.3395    186.60  . Q        .         .         . V       .
  19.250    285.6110    184.62  . Q        .         .         .  V      .
  19.333    286.8693    182.71  . Q        .         .         .  V      .
  19.417    288.1149    180.86  . Q        .         .         .  V      .
  19.500    289.3482    179.08  . Q        .         .         .  V      .
  19.583    290.5698    177.36  . Q        .         .         .  V      .
  19.667    291.7798    175.71  . Q        .         .         .  V      .
  19.750    292.9789    174.10  . Q        .         .         .  V      .
  19.833    294.1671    172.54  . Q        .         .         .   V     .
  19.917    295.3451    171.04  . Q        .         .         .   V     .
  20.000    296.5129    169.58  . Q        .         .         .   V     .
  20.083    297.6711    168.16  . Q        .         .         .   V     .
  20.167    298.8197    166.78  . Q        .         .         .   V     .
  20.250    299.9591    165.44  . Q        .         .         .   V     .
  20.333    301.0896    164.15  . Q        .         .         .   V     .
  20.417    302.2114    162.89  . Q        .         .         .    V    .
  20.500    303.3248    161.66  . Q        .         .         .    V    .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      775.0    1550.0    2325.0    3100.0
-----------------------------------------------------------------------------
  20.583    304.4299    160.46  . Q       .         .         .    V    .
  20.667    305.5269    159.30  . Q       .         .         .    V    .
  20.750    306.6162    158.16  . Q       .         .         .    V    .
  20.833    307.6978    157.05  . Q       .         .         .    V    .
  20.917    308.7721    155.97  . Q       .         .         .    V    .
  21.000    309.8390    154.92  .Q        .         .         .    V    .
  21.083    310.8989    153.89  .Q        .         .         .     V   .
  21.167    311.9518    152.89  .Q        .         .         .     V   .
  21.250    312.9980    151.91  .Q        .         .         .     V   .
  21.333    314.0377    150.95  .Q        .         .         .     V   .
  21.417    315.0708    150.01  .Q        .         .         .     V   .
  21.500    316.0976    149.09  .Q        .         .         .     V   .
  21.583    317.1183    148.20  .Q        .         .         .     V   .
  21.667    318.1329    147.32  .Q        .         .         .     V   .
  21.750    319.1415    146.46  .Q        .         .         .     V   .
  21.833    320.1444    145.62  .Q        .         .         .      V  .
  21.917    321.1416    144.79  .Q        .         .         .      V  .
  22.000    322.1332    143.98  .Q        .         .         .      V  .
  22.083    323.1194    143.19  .Q        .         .         .      V  .
  22.167    324.1002    142.41  .Q        .         .         .      V  .
  22.250    325.0757    141.65  .Q        .         .         .      V  .
  22.333    326.0461    140.90  .Q        .         .         .      V  .
  22.417    327.0115    140.17  .Q        .         .         .      V  .
  22.500    327.9719    139.45  .Q        .         .         .      V  .
  22.583    328.9274    138.74  .Q        .         .         .       V .
  22.667    329.8781    138.04  .Q        .         .         .       V .
  22.750    330.8242    137.36  .Q        .         .         .       V .
  22.833    331.7656    136.69  .Q        .         .         .       V .
  22.917    332.7025    136.04  .Q        .         .         .       V .
  23.000    333.6349    135.39  .Q        .         .         .       V .
  23.083    334.5629    134.75  .Q        .         .         .       V .
  23.167    335.4867    134.13  .Q        .         .         .       V .
  23.250    336.4062    133.51  .Q        .         .         .       V .
  23.333    337.3215    132.91  .Q        .         .         .        V.
  23.417    338.2327    132.31  .Q        .         .         .        V.
  23.500    339.1399    131.72  .Q        .         .         .        V.
  23.583    340.0431    131.14  .Q        .         .         .        V.
  23.667    340.9424    130.58  .Q        .         .         .        V.
  23.750    341.8378    130.02  .Q        .         .         .        V.
  23.833    342.7295    129.47  .Q        .         .         .        V.
  23.917    343.6174    128.93  .Q        .         .         .        V.
  24.000    344.5017    128.39  .Q        .         .         .        V.
  24.083    345.0339     77.29  Q         .         .         .        V.
  24.167    345.2077     25.23  Q         .         .         .        V.
  24.250    345.2647      8.28  Q         .         .         .        V.
  24.333    345.2828      2.62  Q         .         .         .        V.
  24.417    345.2882      0.78  Q         .         .         .        V.
  24.500    345.2892      0.15  Q         .         .         .        V.
  24.583    345.2892      0.00  Q         .         .         .        V.
```

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****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

         WATERCOURSE LENGTH =    9390.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    4740.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     598.000 FEET
         BASIN FACTOR = 0.015
         WATERSHED AREA =     493.000 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.142 HOURS
         * Instantaneous Unit-Hydrograph Option Selected.
          CAUTION: LAG TIME IS LESS THAN 0.75 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         S.C.S. S-GRAPH SELECTED
         WATERSHED RUNOFF CURVE NUMBER =  83.00

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.77
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.45
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.86
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.74
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  8.00
         24-HOUR NESTED DESIGN STORM DISTRIBUTION SELECTED
         (Ref: San Diego County Hydrology Manual)

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.991
          30-MINUTE FACTOR = 0.991
           1-HOUR FACTOR = 0.995
           3-HOUR FACTOR = 0.997
           6-HOUR FACTOR = 0.998
          24-HOUR FACTOR = 0.998

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  58.530


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL       "q/qp" GRAPH          UNIT HYDROGRAPH
     NUMBER               VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 0.786               2388.487
        2                 0.814               2471.645
        3                 0.267                809.684
        4                 0.090                272.268
        5                 0.029                 88.971
        6                 0.010                 30.728
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        7                 0.002                  7.515
        8                 0.000                  0.000



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         TOTAL STORM RAINFALL(INCHES) =  7.99
         TOTAL SOIL-LOSS(INCHES) =  2.02
         TOTAL EFFECTIVE RAINFALL(INCHES) =  5.97

--------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      83.0719
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     249.3613
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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	575.0	1150.0	1725.0	2300.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0000	0.00	Q	.	.	.	.
0.833	0.0000	0.00	Q	.	.	.	.
0.917	0.0000	0.00	Q	.	.	.	.
1.000	0.0000	0.00	Q	.	.	.	.
1.083	0.0000	0.00	Q	.	.	.	.
1.167	0.0000	0.00	Q	.	.	.	.
1.250	0.0000	0.00	Q	.	.	.	.
1.333	0.0000	0.00	Q	.	.	.	.
1.417	0.0000	0.00	Q	.	.	.	.
1.500	0.0000	0.00	Q	.	.	.	.
1.583	0.0000	0.00	Q	.	.	.	.
1.667	0.0000	0.00	Q	.	.	.	.
1.750	0.0000	0.00	Q	.	.	.	.
1.833	0.0000	0.00	Q	.	.	.	.
1.917	0.0000	0.00	Q	.	.	.	.
2.000	0.0000	0.00	Q	.	.	.	.
2.083	0.0020	0.29	Q	.	.	.	.
2.167	0.0108	1.28	Q	.	.	.	.
2.250	0.0300	2.79	Q	.	.	.	.
2.333	0.0606	4.44	Q	.	.	.	.
2.417	0.1028	6.13	Q	.	.	.	.
2.500	0.1566	7.81	Q	.	.	.	.
2.583	0.2218	9.46	Q	.	.	.	.
2.667	0.2981	11.09	Q	.	.	.	.
2.750	0.3855	12.69	Q	.	.	.	.
2.833	0.4837	14.26	Q	.	.	.	.
2.917	0.5926	15.81	Q	.	.	.	.
3.000	0.7120	17.33	Q	.	.	.	.
3.083	0.8417	18.84	Q	.	.	.	.
3.167	0.9816	20.31	Q	.	.	.	.
3.250	1.1316	21.77	Q	.	.	.	.
3.333	1.2913	23.20	Q	.	.	.	.
3.417	1.4609	24.62	Q	.	.	.	.
3.500	1.6400	26.01	Q	.	.	.	.
3.583	1.8286	27.38	Q	.	.	.	.
3.667	2.0265	28.73	Q	.	.	.	.
3.750	2.2336	30.07	Q	.	.	.	.
3.833	2.4498	31.39	Q	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	575.0	1150.0	1725.0	2300.0
3.917	2.6749	32.69	Q	.	.	.	.
4.000	2.9089	33.97	Q	.	.	.	.
4.083	3.1516	35.24	Q	.	.	.	.
4.167	3.4029	36.49	Q	.	.	.	.
4.250	3.6628	37.73	Q	.	.	.	.
4.333	3.9311	38.95	Q	.	.	.	.
4.417	4.2077	40.17	Q	.	.	.	.
4.500	4.4925	41.36	Q	.	.	.	.
4.583	4.7856	42.54	Q	.	.	.	.
4.667	5.0866	43.71	Q	.	.	.	.
4.750	5.3956	44.87	Q	.	.	.	.
4.833	5.7125	46.01	Q	.	.	.	.
4.917	6.0372	47.15	Q	.	.	.	.
5.000	6.3696	48.27	QV	.	.	.	.
5.083	6.7098	49.39	QV	.	.	.	.
5.167	7.0574	50.48	QV	.	.	.	.
5.250	7.4127	51.58	QV	.	.	.	.
5.333	7.7753	52.66	QV	.	.	.	.
5.417	8.1454	53.74	QV	.	.	.	.
5.500	8.5228	54.80	QV	.	.	.	.
5.583	8.9075	55.86	QV	.	.	.	.
5.667	9.2994	56.90	QV	.	.	.	.
5.750	9.6985	57.95	.Q	.	.	.	.
5.833	10.1047	58.98	.Q	.	.	.	.
5.917	10.5180	60.01	.Q	.	.	.	.
6.000	10.9383	61.03	.Q	.	.	.	.
6.083	11.3656	62.05	.Q	.	.	.	.
6.167	11.7999	63.05	.Q	.	.	.	.
6.250	12.2410	64.06	.Q	.	.	.	.
6.333	12.6890	65.05	.QV	.	.	.	.
6.417	13.1439	66.05	.QV	.	.	.	.
6.500	13.6055	67.03	.QV	.	.	.	.
6.583	14.0739	68.02	.QV	.	.	.	.
6.667	14.5491	68.99	.QV	.	.	.	.
6.750	15.0310	69.97	.QV	.	.	.	.
6.833	15.5195	70.94	.QV	.	.	.	.
6.917	16.0148	71.91	.QV	.	.	.	.
7.000	16.5166	72.87	.QV	.	.	.	.
7.083	17.0251	73.84	.QV	.	.	.	.
7.167	17.5402	74.79	.QV	.	.	.	.
7.250	18.0620	75.76	.QV	.	.	.	.
7.333	18.5902	76.70	.QV	.	.	.	.
7.417	19.1251	77.67	.Q V	.	.	.	.
7.500	19.6665	78.61	.Q V	.	.	.	.
7.583	20.2146	79.58	.Q V	.	.	.	.
7.667	20.7691	80.52	.Q V	.	.	.	.
7.750	21.3303	81.48	.Q V	.	.	.	.
7.833	21.8979	82.42	.Q V	.	.	.	.
7.917	22.4722	83.38	.Q V	.	.	.	.
8.000	23.0529	84.33	.Q V	.	.	.	.

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      575.0    1150.0    1725.0    2300.0
-----------------------------------------------------------------------------
   8.083     23.6403     85.29  .Q V      .         .         .         .
   8.167     24.2343     86.24  .Q V      .         .         .         .
   8.250     24.8348     87.20  .Q V      .         .         .         .
   8.333     25.4419     88.15  .Q  V     .         .         .         .
   8.417     26.0557     89.12  .Q  V     .         .         .         .
   8.500     26.6760     90.07  .Q  V     .         .         .         .
   8.583     27.3031     91.05  .Q  V     .         .         .         .
   8.667     27.9367     92.00  .Q  V     .         .         .         .
   8.750     28.5772     92.99  .Q  V     .         .         .         .
   8.833     29.2242     93.95  .Q  V     .         .         .         .
   8.917     29.8781     94.95  .Q  V     .         .         .         .
   9.000     30.5387     95.92  .Q  V     .         .         .         .
   9.083     31.2062     96.92  .Q   V    .         .         .         .
   9.167     31.8805     97.90  .Q   V    .         .         .         .
   9.250     32.5618     98.92  .Q   V    .         .         .         .
   9.333     33.2499     99.91  .Q   V    .         .         .         .
   9.417     33.9450    100.94  .Q   V    .         .         .         .
   9.500     34.6471    101.94  .Q   V    .         .         .         .
   9.583     35.3564    102.99  .Q   V    .         .         .         .
   9.667     36.0727    104.01  .Q   V    .         .         .         .
   9.750     36.7963    105.07  .Q   V    .         .         .         .
   9.833     37.5270    106.10  .Q    V   .         .         .         .
   9.917     38.2652    107.18  .Q    V   .         .         .         .
  10.000     39.0106    108.23  .Q    V   .         .         .         .
  10.083     39.7636    109.33  .Q    V   .         .         .         .
  10.167     40.5240    110.41  .Q    V   .         .         .         .
  10.250     41.2921    111.53  .Q    V   .         .         .         .
  10.333     42.0677    112.63  .Q    V   .         .         .         .
  10.417     42.8513    113.78  .Q    V   .         .         .         .
  10.500     43.6427    114.90  .Q     V  .         .         .         .
  10.583     44.4421    116.08  . Q    V  .         .         .         .
  10.667     45.2494    117.22  . Q    V  .         .         .         .
  10.750     46.0650    118.43  . Q    V  .         .         .         .
  10.833     46.8888    119.61  . Q    V  .         .         .         .
  10.917     47.7211    120.85  . Q    V  .         .         .         .
  11.000     48.5618    122.07  . Q    V  .         .         .         .
  11.083     49.4113    123.35  . Q    V  .         .         .         .
  11.167     50.2694    124.59  . Q     V .         .         .         .
  11.250     51.1365    125.92  . Q     V .         .         .         .
  11.333     52.0126    127.21  . Q     V .         .         .         .
  11.417     52.8981    128.57  . Q     V .         .         .         .
  11.500     53.7928    129.91  . Q     V .         .         .         .
  11.583     54.6973    131.33  . Q     V .         .         .         .
  11.667     55.6112    132.71  . Q     V .         .         .         .
  11.750     56.5354    134.19  . Q      V.         .         .         .
  11.833     57.4695    135.63  . Q      V.         .         .         .
  11.917     58.4141    137.16  . Q      V.         .         .         .
  12.000     59.3691    138.66  . Q      V.         .         .         .
  12.083     60.0842    103.83  .Q       V.         .         .         .
  12.167     60.6463     81.62  .Q       V.         .         .         .
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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      575.0    1150.0    1725.0    2300.0
-----------------------------------------------------------------------------
  12.250     61.2333     85.24  .Q       V.         .         .         .
  12.333     61.8338     87.19  .Q       V.         .         .         .
  12.417     62.4461     88.89  .Q        V         .         .         .
  12.500     63.0685     90.37  .Q        V         .         .         .
  12.583     63.7021     92.00  .Q        V         .         .         .
  12.667     64.3465     93.58  .Q        V         .         .         .
  12.750     65.0026     95.27  .Q        V         .         .         .
  12.833     65.6701     96.92  .Q        V         .         .         .
  12.917     66.3503     98.75  .Q        V         .         .         .
  13.000     67.0428    100.55  .Q        V         .         .         .
  13.083     67.7490    102.55  .Q        V         .         .         .
  13.167     68.4688    104.51  .Q        V         .         .         .
  13.250     69.2036    106.70  .Q        .V        .         .         .
  13.333     69.9533    108.85  .Q        .V        .         .         .
  13.417     70.7195    111.25  .Q        .V        .         .         .
  13.500     71.5020    113.63  .Q        .V        .         .         .
  13.583     72.3029    116.29  . Q       .V        .         .         .
  13.667     73.1219    118.93  . Q       .V        .         .         .
  13.750     73.9614    121.89  . Q       .V        .         .         .
  13.833     74.8212    124.84  . Q       . V       .         .         .
  13.917     75.7040    128.18  . Q       . V       .         .         .
  14.000     76.6097    131.50  . Q       . V       .         .         .
  14.083     77.5430    135.52  . Q       . V       .         .         .
  14.167     78.5041    139.55  . Q       . V       .         .         .
  14.250     79.4955    143.95  . Q       . V       .         .         .
  14.333     80.5170    148.32  . Q       . V       .         .         .
  14.417     81.5732    153.36  . Q       .  V      .         .         .
  14.500     82.6643    158.43  . Q       .  V      .         .         .
  14.583     83.7962    164.35  . Q       .  V      .         .         .
  14.667     84.9695    170.36  . Q       .  V      .         .         .
  14.750     86.1918    177.48  .  Q      .  V      .         .         .
  14.833     87.4643    184.76  .  Q      .   V     .         .         .
  14.917     88.7970    193.51  .  Q      .   V     .         .         .
  15.000     90.1920    202.56  .  Q      .   V     .         .         .
  15.083     91.6633    213.64  .  Q      .   V     .         .         .
  15.167     93.2147    225.26  .  Q      .   V     .         .         .
  15.250     94.8669    239.89  .   Q     .    V    .         .         .
  15.333     96.6267    255.53  .   Q     .    V    .         .         .
  15.417     98.5443    278.44  .   Q     .    V    .         .         .
  15.500    100.6333    303.33  .    Q    .     V   .         .         .
  15.583    102.9398    334.90  .    Q    .     V   .         .         .
  15.667    105.4918    370.56  .     Q   .     V   .         .         .
  15.750    108.4095    423.64  .      Q  .      V  .         .         .
  15.833    111.7947    491.54  .       Q .      V  .         .         .
  15.917    116.1802    636.77  .         .Q      V .         .         .
  16.000    122.3249    892.20  .         .    Q   V.         .         .
  16.083    137.9860   2274.00  .         .          . V       .        Q.
  16.167    153.0365   2185.33  .         .          .   V     .       Q .
  16.250    160.5198   1086.57  .         .       Q .    V    .         .
  16.333    164.8709    631.78  .         Q          .     V   .         .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      575.0    1150.0    1725.0    2300.0
-----------------------------------------------------------------------------
  16.417    167.8101    426.77  .       Q  .         .     V   .         .
  16.500    170.0642    327.29  .    Q     .         .      V  .         .
  16.583    171.9276    270.56  .   Q      .         .      V  .         .
  16.667    173.5526    235.96  .   Q      .         .      V  .         .
  16.750    175.0230    213.50  .  Q       .         .       V .         .
  16.833    176.3734    196.08  .  Q       .         .       V .         .
  16.917    177.6269    182.02  .  Q       .         .       V .         .
  17.000    178.8002    170.36  . Q        .         .       V .         .
  17.083    179.9037    160.22  . Q        .         .       V .         .
  17.167    180.9467    151.44  . Q        .         .        V.         .
  17.250    181.9379    143.92  . Q        .         .        V.         .
  17.333    182.8837    137.34  . Q        .         .        V.         .
  17.417    183.7894    131.50  . Q        .         .        V.         .
  17.500    184.6590    126.27  . Q        .         .        V.         .
  17.583    185.4961    121.55  . Q        .         .        V.         .
  17.667    186.3037    117.26  . Q        .         .        V.         .
  17.750    187.0844    113.35  .Q         .         .         V         .
  17.833    187.8403    109.76  .Q         .         .         V         .
  17.917    188.5734    106.45  .Q         .         .         V         .
  18.000    189.2854    103.38  .Q         .         .         V         .
  18.083    190.1566    126.50  . Q        .         .         V         .
  18.167    191.1943    150.67  . Q        .         .         V         .
  18.250    192.2750    156.91  . Q        .         .         V         .
  18.333    193.3593    157.44  . Q        .         .         .V        .
  18.417    194.4343    156.10  . Q        .         .         .V        .
  18.500    195.4966    154.24  . Q        .         .         .V        .
  18.583    196.5451    152.24  . Q        .         .         .V        .
  18.667    197.5799    150.25  . Q        .         .         .V        .
  18.750    198.6016    148.35  . Q        .         .         .V        .
  18.833    199.6108    146.54  . Q        .         .         . V       .
  18.917    200.6081    144.81  . Q        .         .         . V       .
  19.000    201.5939    143.14  . Q        .         .         . V       .
  19.083    202.5688    141.54  . Q        .         .         . V       .
  19.167    203.5330    140.01  . Q        .         .         . V       .
  19.250    204.4871    138.53  . Q        .         .         . V       .
  19.333    205.4314    137.11  . Q        .         .         . V       .
  19.417    206.3662    135.74  . Q        .         .         .  V      .
  19.500    207.2920    134.42  . Q        .         .         .  V      .
  19.583    208.2089    133.14  . Q        .         .         .  V      .
  19.667    209.1173    131.90  . Q        .         .         .  V      .
  19.750    210.0175    130.71  . Q        .         .         .  V      .
  19.833    210.9097    129.55  . Q        .         .         .  V      .
  19.917    211.7942    128.43  . Q        .         .         .  V      .
  20.000    212.6713    127.34  . Q        .         .         .   V     .
  20.083    213.5410    126.29  . Q        .         .         .   V     .
  20.167    214.4037    125.27  . Q        .         .         .   V     .
  20.250    215.2596    124.27  . Q        .         .         .   V     .
  20.333    216.1089    123.31  . Q        .         .         .   V     .
  20.417    216.9516    122.37  . Q        .         .         .   V     .
  20.500    217.7881    121.45  . Q        .         .         .   V     .
```

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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      575.0    1150.0    1725.0    2300.0
-----------------------------------------------------------------------------
  20.583    218.6184    120.57  . Q       .         .         .    V    .
  20.667    219.4428    119.70  . Q       .         .         .    V    .
  20.750    220.2613    118.85  . Q       .         .         .    V    .
  20.833    221.0742    118.03  . Q       .         .         .    V    .
  20.917    221.8815    117.23  . Q       .         .         .    V    .
  21.000    222.6835    116.44  . Q       .         .         .    V    .
  21.083    223.4802    115.68  . Q       .         .         .    V    .
  21.167    224.2717    114.93  .Q        .         .         .    V    .
  21.250    225.0582    114.20  .Q        .         .         .     V   .
  21.333    225.8398    113.48  .Q        .         .         .     V   .
  21.417    226.6165    112.79  .Q        .         .         .     V   .
  21.500    227.3886    112.10  .Q        .         .         .     V   .
  21.583    228.1561    111.44  .Q        .         .         .     V   .
  21.667    228.9190    110.78  .Q        .         .         .     V   .
  21.750    229.6776    110.14  .Q        .         .         .     V   .
  21.833    230.4318    109.51  .Q        .         .         .     V   .
  21.917    231.1818    108.90  .Q        .         .         .      V  .
  22.000    231.9277    108.30  .Q        .         .         .      V  .
  22.083    232.6695    107.71  .Q        .         .         .      V  .
  22.167    233.4073    107.13  .Q        .         .         .      V  .
  22.250    234.1412    106.56  .Q        .         .         .      V  .
  22.333    234.8713    106.01  .Q        .         .         .      V  .
  22.417    235.5975    105.46  .Q        .         .         .      V  .
  22.500    236.3202    104.92  .Q        .         .         .      V  .
  22.583    237.0391    104.40  .Q        .         .         .       V .
  22.667    237.7546    103.88  .Q        .         .         .       V .
  22.750    238.4665    103.37  .Q        .         .         .       V .
  22.833    239.1750    102.87  .Q        .         .         .       V .
  22.917    239.8801    102.38  .Q        .         .         .       V .
  23.000    240.5818    101.90  .Q        .         .         .       V .
  23.083    241.2804    101.42  .Q        .         .         .       V .
  23.167    241.9757    100.96  .Q        .         .         .       V .
  23.250    242.6678    100.50  .Q        .         .         .       V .
  23.333    243.3568    100.05  .Q        .         .         .        V.
  23.417    244.0428     99.60  .Q        .         .         .        V.
  23.500    244.7258     99.17  .Q        .         .         .        V.
  23.583    245.4058     98.74  .Q        .         .         .        V.
  23.667    246.0829     98.31  .Q        .         .         .        V.
  23.750    246.7571     97.90  .Q        .         .         .        V.
  23.833    247.4285     97.49  .Q        .         .         .        V.
  23.917    248.0971     97.08  .Q        .         .         .        V.
  24.000    248.7630     96.69  .Q        .         .         .        V.
  24.083    249.1661     58.54  .Q        .         .         .        V.
  24.167    249.2986     19.23  Q         .         .         .        V.
  24.250    249.3423      6.35  Q         .         .         .        V.
  24.333    249.3562      2.02  Q         .         .         .        V.
  24.417    249.3604      0.61  Q         .         .         .        V.
  24.500    249.3613      0.12  Q         .         .         .        V.
  24.583    249.3613      0.00  Q         .         .         .        V.
```

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****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #3)

         WATERCOURSE LENGTH =    5913.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    2764.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     286.000 FEET
         BASIN FACTOR = 0.015
         WATERSHED AREA =     255.000 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.103 HOURS
         * Instantaneous Unit-Hydrograph Option Selected.
          CAUTION: LAG TIME IS LESS THAN 0.75 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         S.C.S. S-GRAPH SELECTED
         WATERSHED RUNOFF CURVE NUMBER =  85.00

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.77
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.45
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.86
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.74
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  8.00
         24-HOUR NESTED DESIGN STORM DISTRIBUTION SELECTED
         (Ref: San Diego County Hydrology Manual)

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.995
          30-MINUTE FACTOR = 0.995
           1-HOUR FACTOR = 0.998
           3-HOUR FACTOR = 0.998
           6-HOUR FACTOR = 0.999
          24-HOUR FACTOR = 0.999

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  81.285


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL       "q/qp" GRAPH          UNIT HYDROGRAPH
     NUMBER               VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 0.994               2169.559
        2                 0.339                738.625
        3                 0.074                161.118
        4                 0.016                 34.586
        5                 0.003                  6.228
        6                 0.000                  0.000
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         TOTAL STORM RAINFALL(INCHES) =  7.99
         TOTAL SOIL-LOSS(INCHES) =  1.79
         TOTAL EFFECTIVE RAINFALL(INCHES) =  6.21

-----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      37.9640
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     132.9528
-----------------------------------------------------------------------------
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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	450.0	900.0	1350.0	1800.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0000	0.00	Q	.	.	.	.
0.833	0.0000	0.00	Q	.	.	.	.
0.917	0.0000	0.00	Q	.	.	.	.
1.000	0.0000	0.00	Q	.	.	.	.
1.083	0.0000	0.00	Q	.	.	.	.
1.167	0.0000	0.00	Q	.	.	.	.
1.250	0.0000	0.00	Q	.	.	.	.
1.333	0.0000	0.00	Q	.	.	.	.
1.417	0.0000	0.00	Q	.	.	.	.
1.500	0.0000	0.00	Q	.	.	.	.
1.583	0.0000	0.00	Q	.	.	.	.
1.667	0.0000	0.00	Q	.	.	.	.
1.750	0.0001	0.01	Q	.	.	.	.
1.833	0.0034	0.49	Q	.	.	.	.
1.917	0.0128	1.37	Q	.	.	.	.
2.000	0.0290	2.35	Q	.	.	.	.
2.083	0.0521	3.34	Q	.	.	.	.
2.167	0.0818	4.32	Q	.	.	.	.
2.250	0.1181	5.28	Q	.	.	.	.
2.333	0.1609	6.21	Q	.	.	.	.
2.417	0.2100	7.13	Q	.	.	.	.
2.500	0.2653	8.02	Q	.	.	.	.
2.583	0.3266	8.91	Q	.	.	.	.
2.667	0.3939	9.77	Q	.	.	.	.
2.750	0.4671	10.62	Q	.	.	.	.
2.833	0.5459	11.45	Q	.	.	.	.
2.917	0.6304	12.27	Q	.	.	.	.
3.000	0.7205	13.07	Q	.	.	.	.
3.083	0.8159	13.86	Q	.	.	.	.
3.167	0.9167	14.63	Q	.	.	.	.
3.250	1.0227	15.40	Q	.	.	.	.
3.333	1.1339	16.14	Q	.	.	.	.
3.417	1.2502	16.88	Q	.	.	.	.
3.500	1.3714	17.60	Q	.	.	.	.
3.583	1.4975	18.32	Q	.	.	.	.
3.667	1.6285	19.01	Q	.	.	.	.
3.750	1.7642	19.71	Q	.	.	.	.
3.833	1.9046	20.38	Q	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 450.0 900.0 1350.0 1800.0
3.917	2.0497	21.06	Q . . . .
4.000	2.1992	21.71	Q . . . .
4.083	2.3534	22.38	Q . . . .
4.167	2.5118	23.01	Q . . . .
4.250	2.6747	23.65	Q . . . .
4.333	2.8419	24.27	Q . . . .
4.417	3.0133	24.90	Q . . . .
4.500	3.1889	25.49	Q . . . .
4.583	3.3687	26.11	QV . . . .
4.667	3.5526	26.69	QV . . . .
4.750	3.7406	27.29	QV . . . .
4.833	3.9324	27.86	QV . . . .
4.917	4.1284	28.45	QV . . . .
5.000	4.3281	29.00	QV . . . .
5.083	4.5319	29.58	QV . . . .
5.167	4.7394	30.13	QV . . . .
5.250	4.9508	30.69	QV . . . .
5.333	5.1658	31.22	QV . . . .
5.417	5.3847	31.78	QV . . . .
5.500	5.6071	32.30	QV . . . .
5.583	5.8334	32.85	QV . . . .
5.667	6.0632	33.36	QV . . . .
5.750	6.2967	33.90	QV . . . .
5.833	6.5336	34.40	QV . . . .
5.917	6.7742	34.94	Q V . . . .
6.000	7.0183	35.43	Q V . . . .
6.083	7.2659	35.96	Q V . . . .
6.167	7.5169	36.45	Q V . . . .
6.250	7.7716	36.97	Q V . . . .
6.333	8.0295	37.45	Q V . . . .
6.417	8.2910	37.97	Q V . . . .
6.500	8.5557	38.44	Q V . . . .
6.583	8.8240	38.95	Q V . . . .
6.667	9.0955	39.42	Q V . . . .
6.750	9.3705	39.93	Q V . . . .
6.833	9.6487	40.39	Q V . . . .
6.917	9.9304	40.90	Q V . . . .
7.000	10.2152	41.36	Q V . . . .
7.083	10.5036	41.87	Q V . . . .
7.167	10.7950	42.32	Q V . . . .
7.250	11.0900	42.83	Q V . . . .
7.333	11.3880	43.28	Q V . . . .
7.417	11.6896	43.78	Q V . . . .
7.500	11.9942	44.23	Q V . . . .
7.583	12.3023	44.74	Q V . . . .
7.667	12.6135	45.18	.Q V . . . .
7.750	12.9281	45.69	.Q V . . . .
7.833	13.2459	46.13	.Q V . . . .
7.917	13.5671	46.64	.Q V . . . .
8.000	13.8914	47.09	.Q V . . . .

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-------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      450.0     900.0    1350.0    1800.0
-------------------------------------------------------------------------------
   8.083     14.2192     47.60  .Q  V     .         .         .         .
   8.167     14.5501     48.04  .Q  V     .         .         .         .
   8.250     14.8845     48.56  .Q  V     .         .         .         .
   8.333     15.2219     49.00  .Q  V     .         .         .         .
   8.417     15.5630     49.52  .Q  V     .         .         .         .
   8.500     15.9071     49.96  .Q  V     .         .         .         .
   8.583     16.2547     50.48  .Q  V     .         .         .         .
   8.667     16.6055     50.93  .Q  V     .         .         .         .
   8.750     16.9599     51.46  .Q   V    .         .         .         .
   8.833     17.3174     51.91  .Q   V    .         .         .         .
   8.917     17.6786     52.44  .Q   V    .         .         .         .
   9.000     18.0429     52.90  .Q   V    .         .         .         .
   9.083     18.4109     53.44  .Q   V    .         .         .         .
   9.167     18.7821     53.89  .Q   V    .         .         .         .
   9.250     19.1571     54.44  .Q   V    .         .         .         .
   9.333     19.5352     54.90  .Q   V    .         .         .         .
   9.417     19.9171     55.46  .Q   V    .         .         .         .
   9.500     20.3023     55.93  .Q    V   .         .         .         .
   9.583     20.6914     56.49  .Q    V   .         .         .         .
   9.667     21.0837     56.97  .Q    V   .         .         .         .
   9.750     21.4801     57.55  .Q    V   .         .         .         .
   9.833     21.8797     58.02  .Q    V   .         .         .         .
   9.917     22.2834     58.62  .Q    V   .         .         .         .
  10.000     22.6904     59.10  .Q    V   .         .         .         .
  10.083     23.1016     59.71  .Q    V   .         .         .         .
  10.167     23.5163     60.20  .Q     V  .         .         .         .
  10.250     23.9351     60.82  .Q     V  .         .         .         .
  10.333     24.3575     61.33  .Q     V  .         .         .         .
  10.417     24.7843     61.96  .Q     V  .         .         .         .
  10.500     25.2146     62.48  .Q     V  .         .         .         .
  10.583     25.6494     63.13  .Q     V  .         .         .         .
  10.667     26.0879     63.66  .Q     V  .         .         .         .
  10.750     26.5310     64.34  .Q     V  .         .         .         .
  10.833     26.9778     64.88  .Q      V .         .         .         .
  10.917     27.4294     65.57  .Q      V .         .         .         .
  11.000     27.8849     66.13  .Q      V .         .         .         .
  11.083     28.3452     66.85  .Q      V .         .         .         .
  11.167     28.8096     67.42  .Q      V .         .         .         .
  11.250     29.2791     68.17  .Q      V .         .         .         .
  11.333     29.7526     68.76  .Q      V .         .         .         .
  11.417     30.2315     69.53  .Q       V.         .         .         .
  11.500     30.7146     70.14  .Q       V.         .         .         .
  11.583     31.2032     70.95  .Q       V.         .         .         .
  11.667     31.6962     71.58  .Q       V.         .         .         .
  11.750     32.1950     72.42  .Q       V.         .         .         .
  11.833     32.6983     73.08  .Q       V.         .         .         .
  11.917     33.2076     73.96  .Q       V.         .         .         .
  12.000     33.7217     74.65  .Q        V         .         .         .
  12.083     34.0037     40.94  Q         V         .         .         .
  12.167     34.3006     43.11  Q         V         .         .         .
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-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      450.0     900.0    1350.0    1800.0
-----------------------------------------------------------------------------
  12.250     34.6167     45.90  .Q        V         .         .         .
  12.333     34.9401     46.96  .Q        V         .         .         .
  12.417     35.2704     47.95  .Q        V         .         .         .
  12.500     35.6054     48.64  .Q        V         .         .         .
  12.583     35.9469     49.58  .Q        V         .         .         .
  12.667     36.2933     50.30  .Q        V         .         .         .
  12.750     36.6466     51.31  .Q        .V        .         .         .
  12.833     37.0054     52.08  .Q        .V        .         .         .
  12.917     37.3717     53.19  .Q        .V        .         .         .
  13.000     37.7438     54.03  .Q        .V        .         .         .
  13.083     38.1241     55.23  .Q        .V        .         .         .
  13.167     38.5108     56.15  .Q        .V        .         .         .
  13.250     38.9066     57.47  .Q        .V        .         .         .
  13.333     39.3093     58.47  .Q        .V        .         .         .
  13.417     39.7221     59.93  .Q        .V        .         .         .
  13.500     40.1424     61.04  .Q        . V       .         .         .
  13.583     40.5739     62.65  .Q        . V       .         .         .
  13.667     41.0139     63.89  .Q        . V       .         .         .
  13.750     41.4664     65.69  .Q        . V       .         .         .
  13.833     41.9283     67.07  .Q        . V       .         .         .
  13.917     42.4043     69.11  .Q        . V       .         .         .
  14.000     42.8909     70.67  .Q        . V       .         .         .
  14.083     43.3944     73.10  .Q        .  V      .         .         .
  14.167     43.9103     74.91  .Q        .  V      .         .         .
  14.250     44.4445     77.58  .Q        .  V      .         .         .
  14.333     44.9929     79.62  .Q        .  V      .         .         .
  14.417     45.5626     82.72  .Q        .  V      .         .         .
  14.500     46.1488     85.12  .Q        .  V      .         .         .
  14.583     46.7603     88.78  .Q        .   V     .         .         .
  14.667     47.3914     91.63  . Q       .   V     .         .         .
  14.750     48.0530     96.06  . Q       .   V     .         .         .
  14.833     48.7384     99.53  . Q       .   V     .         .         .
  14.917     49.4616    105.01  . Q       .   V     .         .         .
  15.000     50.2146    109.33  . Q       .    V    .         .         .
  15.083     51.0157    116.33  . Q       .    V    .         .         .
  15.167     51.8555    121.93  . Q       .    V    .         .         .
  15.250     52.7594    131.26  . Q       .    V    .         .         .
  15.333     53.7158    138.87  .  Q      .     V   .         .         .
  15.417     54.7715    153.28  .  Q      .     V   .         .         .
  15.500     55.9060    164.74  .  Q      .     V   .         .         .
  15.583     57.1820    185.27  .   Q     .      V  .         .         .
  15.667     58.5828    203.41  .   Q     .      V  .         .         .
  15.750     60.2384    240.39  .    Q    .       V .         .         .
  15.833     62.1514    277.76  .     Q   .       V .         .         .
  15.917     64.8073    385.64  .       Q .        V.         .         .
  16.000     68.5683    546.10  .         . Q       V         .         .
  16.083     80.3765   1714.55  .         .         .   V     .        Q .
  16.167     85.9545    809.92  .         .      Q  .    V    .         .
  16.250     88.5269    373.52  .       Q .         .     V   .         .
  16.333     90.1278    232.45  .    Q    .         .      V  .         .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      450.0     900.0    1350.0    1800.0
-----------------------------------------------------------------------------
  16.417     91.3318    174.82  .  Q      .         .      V  .         .
  16.500     92.3345    145.59  .  Q      .         .      V  .         .
  16.583     93.2173    128.18  . Q       .         .       V .         .
  16.667     94.0123    115.43  . Q       .         .       V .         .
  16.750     94.7393    105.56  . Q       .         .       V .         .
  16.833     95.4117     97.63  . Q       .         .       V .         .
  16.917     96.0390     91.08  . Q       .         .       V .         .
  17.000     96.6283     85.57  .Q        .         .        V.         .
  17.083     97.1842     80.72  .Q        .         .        V.         .
  17.167     97.7116     76.57  .Q        .         .        V.         .
  17.250     98.2140     72.95  .Q        .         .        V.         .
  17.333     98.6943     69.75  .Q        .         .        V.         .
  17.417     99.1550     66.88  .Q        .         .        V.         .
  17.500     99.5978     64.31  .Q        .         .        V.         .
  17.583    100.0246     61.97  .Q        .         .         V         .
  17.667    100.4368     59.84  .Q        .         .         V         .
  17.750    100.8355     57.89  .Q        .         .         V         .
  17.833    101.2218     56.10  .Q        .         .         V         .
  17.917    101.5967     54.44  .Q        .         .         V         .
  18.000    101.9611     52.90  .Q        .         .         V         .
  18.083    102.4810     75.49  .Q        .         .         V         .
  18.167    103.0477     82.29  .Q        .         .         .V        .
  18.250    103.6177     82.77  .Q        .         .         .V        .
  18.333    104.1818     81.91  .Q        .         .         .V        .
  18.417    104.7383     80.80  .Q        .         .         .V        .
  18.500    105.2871     79.69  .Q        .         .         .V        .
  18.583    105.8286     78.62  .Q        .         .         .V        .
  18.667    106.3631     77.61  .Q        .         .         . V       .
  18.750    106.8909     76.64  .Q        .         .         . V       .
  18.833    107.4123     75.71  .Q        .         .         . V       .
  18.917    107.9276     74.82  .Q        .         .         . V       .
  19.000    108.4370     73.97  .Q        .         .         . V       .
  19.083    108.9407     73.15  .Q        .         .         . V       .
  19.167    109.4391     72.36  .Q        .         .         . V       .
  19.250    109.9322     71.60  .Q        .         .         .  V      .
  19.333    110.4203     70.87  .Q        .         .         .  V      .
  19.417    110.9035     70.17  .Q        .         .         .  V      .
  19.500    111.3820     69.48  .Q        .         .         .  V      .
  19.583    111.8560     68.83  .Q        .         .         .  V      .
  19.667    112.3257     68.19  .Q        .         .         .  V      .
  19.750    112.7911     67.57  .Q        .         .         .  V      .
  19.833    113.2524     66.98  .Q        .         .         .   V     .
  19.917    113.7097     66.40  .Q        .         .         .   V     .
  20.000    114.1631     65.84  .Q        .         .         .   V     .
  20.083    114.6128     65.30  .Q        .         .         .   V     .
  20.167    115.0589     64.77  .Q        .         .         .   V     .
  20.250    115.5014     64.25  .Q        .         .         .   V     .
  20.333    115.9405     63.76  .Q        .         .         .   V     .
  20.417    116.3763     63.27  .Q        .         .         .    V    .
  20.500    116.8088     62.80  .Q        .         .         .    V    .
```

```
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      450.0     900.0    1350.0    1800.0
-----------------------------------------------------------------------------
  20.583    117.2381     62.34  .Q        .         .         .    V    .
  20.667    117.6644     61.89  .Q        .         .         .    V    .
  20.750    118.0877     61.45  .Q        .         .         .    V    .
  20.833    118.5080     61.03  .Q        .         .         .    V    .
  20.917    118.9254     60.61  .Q        .         .         .    V    .
  21.000    119.3401     60.21  .Q        .         .         .    V    .
  21.083    119.7520     59.81  .Q        .         .         .     V   .
  21.167    120.1613     59.43  .Q        .         .         .     V   .
  21.250    120.5680     59.05  .Q        .         .         .     V   .
  21.333    120.9721     58.68  .Q        .         .         .     V   .
  21.417    121.3737     58.32  .Q        .         .         .     V   .
  21.500    121.7729     57.96  .Q        .         .         .     V   .
  21.583    122.1697     57.62  .Q        .         .         .     V   .
  21.667    122.5642     57.28  .Q        .         .         .     V   .
  21.750    122.9564     56.95  .Q        .         .         .     V   .
  21.833    123.3464     56.62  .Q        .         .         .      V  .
  21.917    123.7341     56.30  .Q        .         .         .      V  .
  22.000    124.1197     55.99  .Q        .         .         .      V  .
  22.083    124.5032     55.69  .Q        .         .         .      V  .
  22.167    124.8847     55.38  .Q        .         .         .      V  .
  22.250    125.2641     55.09  .Q        .         .         .      V  .
  22.333    125.6415     54.80  .Q        .         .         .      V  .
  22.417    126.0169     54.52  .Q        .         .         .      V  .
  22.500    126.3905     54.24  .Q        .         .         .       V .
  22.583    126.7621     53.96  .Q        .         .         .       V .
  22.667    127.1319     53.70  .Q        .         .         .       V .
  22.750    127.4999     53.43  .Q        .         .         .       V .
  22.833    127.8662     53.17  .Q        .         .         .       V .
  22.917    128.2306     52.92  .Q        .         .         .       V .
  23.000    128.5933     52.67  .Q        .         .         .       V .
  23.083    128.9544     52.42  .Q        .         .         .       V .
  23.167    129.3137     52.18  .Q        .         .         .       V .
  23.250    129.6714     51.94  .Q        .         .         .        V.
  23.333    130.0276     51.71  .Q        .         .         .        V.
  23.417    130.3821     51.48  .Q        .         .         .        V.
  23.500    130.7350     51.25  .Q        .         .         .        V.
  23.583    131.0864     51.03  .Q        .         .         .        V.
  23.667    131.4363     50.81  .Q        .         .         .        V.
  23.750    131.7848     50.59  .Q        .         .         .        V.
  23.833    132.1317     50.38  .Q        .         .         .        V.
  23.917    132.4772     50.17  .Q        .         .         .        V.
  24.000    132.8213     49.96  .Q        .         .         .        V.
  24.083    132.9253     15.10  Q         .         .         .        V.
  24.167    132.9476      3.24  Q         .         .         .        V.
  24.250    132.9521      0.65  Q         .         .         .        V.
  24.333    132.9528      0.10  Q         .         .         .        V.
  24.417    132.9528      0.00  Q         .         .         .        V.
=============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

100-YEAR HYDROLOGY CALCULATIONS FOR OFF-SITE IMPROVEMENTS

There are several off-site improvements required for this Tentative Map, one of these off-site improvements, located at the northeasterly corner of the intersection of Old Highway 395 and W. Lilac Road, requires additional drainage facilities to protect the proposed slopes to accommodate the maximum 8' widening of W. Lilac Road. Most of the widening occurs over the existing flat, compacted parkway along the northerly side of W. Lilac Road. The upstream area consists of an agricultural operation over an ridge line, located northerly of W. Lilac Road.

Under existing conditions, the runoff from the southerly sloping terrain sheet flows southerly and onto the existing W. Lilac Road. The runoff is then conveyed westerly along the existing AC berm to the intersection with Old Highway 395. The runoff is then conveyed northerly along the existing AC Berm on the easterly side of Old Highway 395 approximately 825' to an existing AC spillway located at the beginning of the existing guard rails and discharges the runoff onto a natural drainage channel.

Under the proposed conditions, the runoff from the southerly sloping terrain sheet flows southerly to a proposed brow ditch along the top of the proposed cut slope. The brow ditch will direct the runoff to two low points on the northerly side of W. Lilac Road. The westerly low point is located at the north easterly corner of the intersection, the brow ditch will convey the runoff into a proposed drain inlet that discharges the runoff onto the roadway via a proposed curb outlet. The easterly low point is located approximately 300' easterly from the intersection. The brow ditch will convey the runoff into a proposed drain inlet that discharges onto W. Lilac Road via a headwall and riprap. Once the runoff from these two discharge points reach W. Lilac Road, it will flowing the existing drainage pattern as described in above paragraph. The hydrology calculations are only for the sizing of the proposed drainage facilities.

HYDROLOGY CALCULATIONS

TRIBUTARY AREA	AREA	C	I	Q
			(IN/HR)	(CFS)
A-1	0.5	0.36	8.7	1.6
A-2	0.5	0.36	8.7	1.6

CONCLUSION

Based on the hydrology and hydraulic calculations, the proposed drainage system at the intersection of Old Highway 395 and W. Lilac Road is adequate to handle the anticipated flow from the upstream areas. The minor widening of W. Lilac Road does not alter the existing drainage pattern.

HYDRAULIC CALCULATION:

CURB OUTLET CAPACITY
Worksheet for Rectangular Channel

Project Description	
Worksheet	CURB OUTLET
Flow Element	Rectangular Cha
Method	Manning's Form
Solve For	Discharge

Input Data		
Mannings Coeffic	0.013	
Channel Slope	2.00	%
Depth	3.0	in
Bottom Width	3.00	ft

Results		
Discharge	4.34	cfs
Flow Area	0.8	ft²
Wetted Perim	3.50	ft
Top Width	3.00	ft
Critical Depth	0.40	ft
Critical Slope	0.46	%
Velocity	5.79	ft/s
Velocity Head	0.52	ft
Specific Energ	9.2	in
Froude Numb	2.04	
Flow Type	Supercritical	

CURB OUTLET FLOW
Worksheet for Rectangular Channel

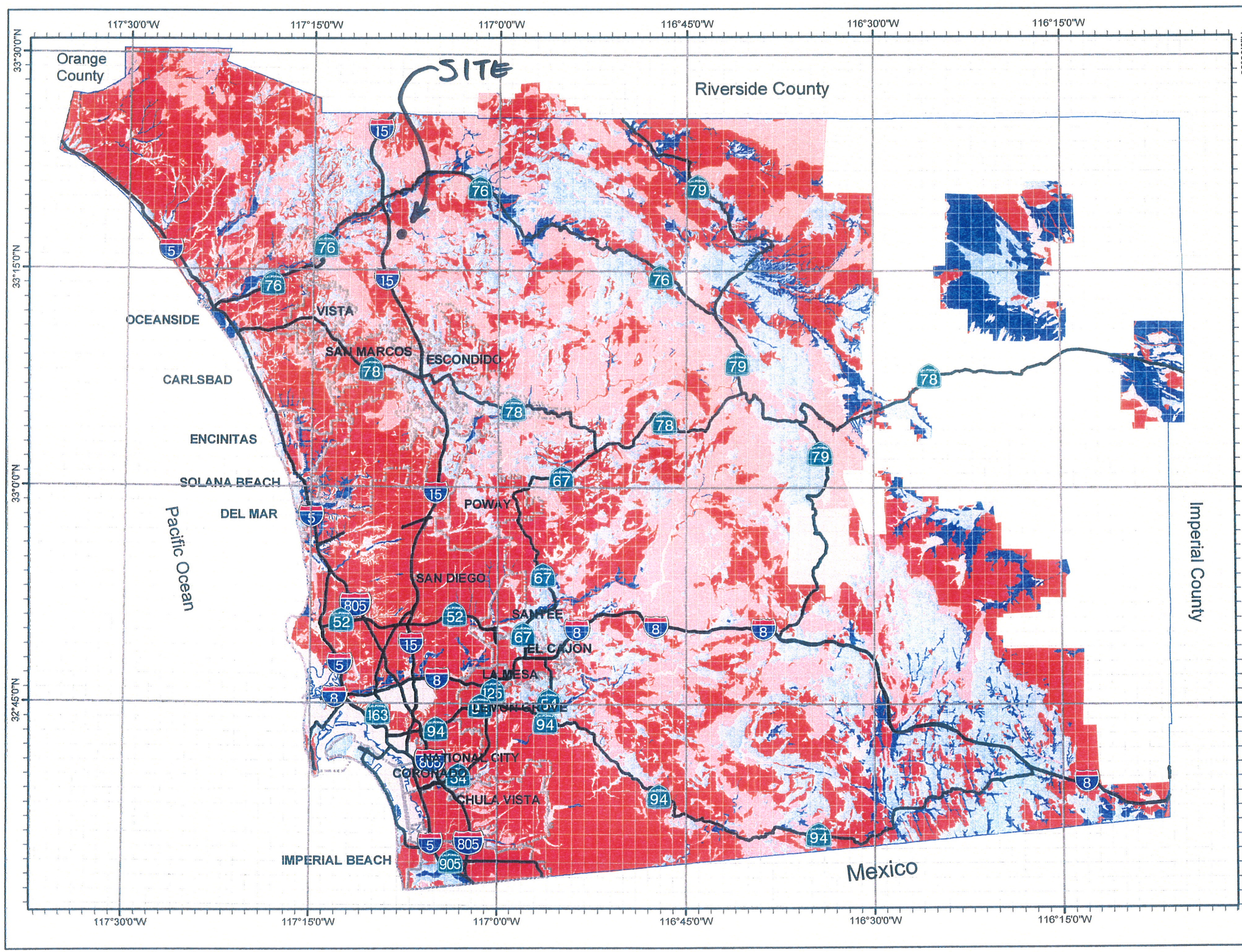
Project Description	
Worksheet	CURB OUTLET
Flow Element	Rectangular Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.013	
Channel Slope	2.00	%
Bottom Width	3.00	ft
Discharge	1.60	cfs

Results		
Depth	1.6	in
Flow Area	0.4	ft²
Wetted Perim	3.27	ft
Top Width	3.00	ft
Critical Depth	0.21	ft
Critical Slope	0.49	%
Velocity	4.00	ft/s
Velocity Head	0.25	ft
Specific Energ	4.6	in
Froude Numb	1.93	
Flow Type	Supercritical	

APPENDIX

County of San Diego Hydrology Manual Soil Hydrologic Group



Legend

- Major Roads
- Incorporated City Bdy

HYDROLOGIC SOIL GROUP

- Hydrologic Group Undefined
- Hydrologic Group A
- Hydrologic Group B
- Hydrologic Group C
- Hydrologic Group D
- No Soil Data

Note: Soil Data Source
USDA/NRCS
SSURGO Soils 2007

N

31.50 3 Miles

1" = 1980'

DPW GIS

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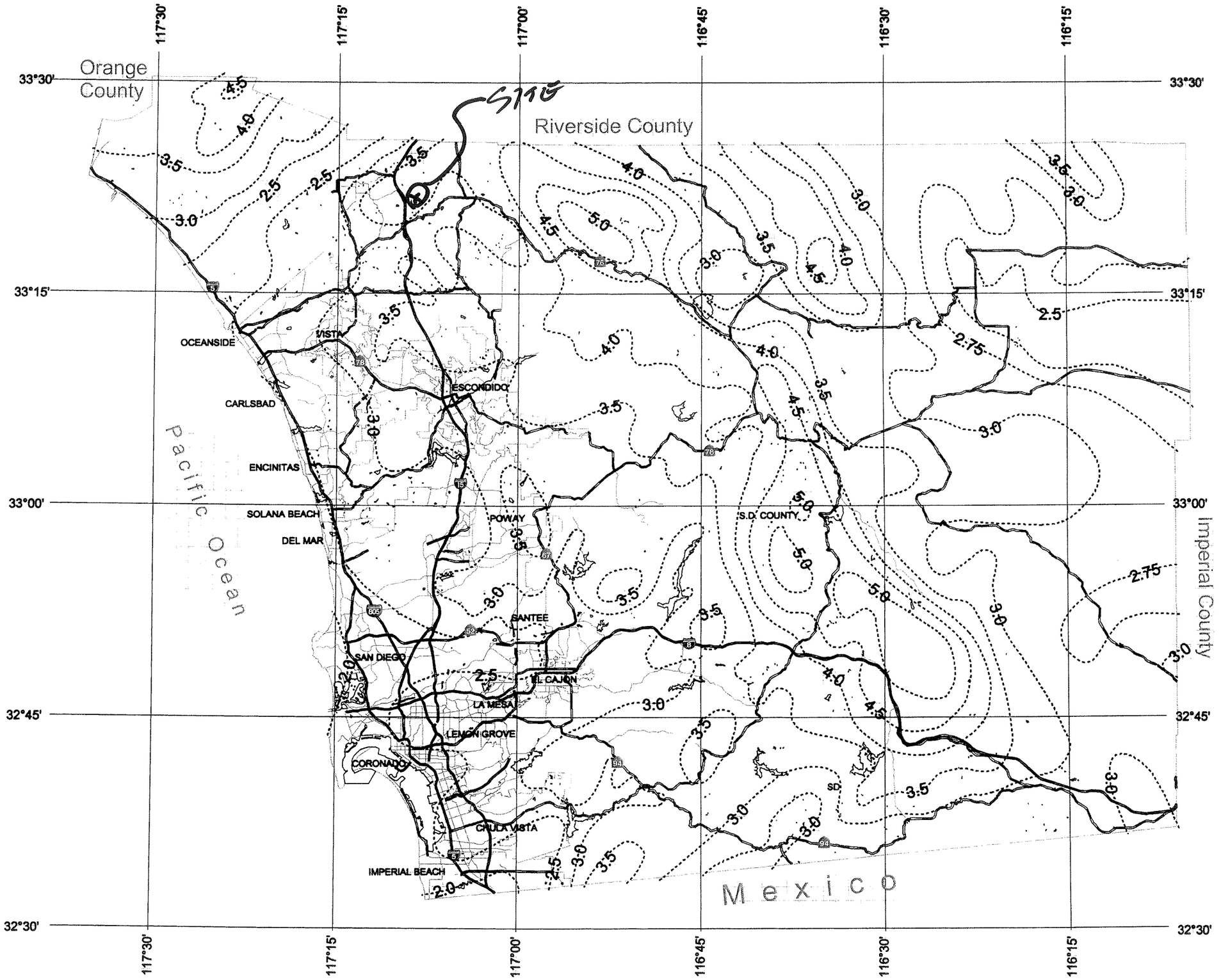
County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

6 = 3.5 in



DPW GIS
Department of Public Works
Geographic Information Services

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Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

Table 4-2 (Continued)
RUNOFF CURVE NUMBERS[1] FOR PZN CONDITION = 2.0

Cover Description	Cover Treatment or Practice[2]	Hydrologic Condition[3]	Average Percent Impervious Area[4]	Curve Numbers for Hydrologic Soil Groups: A	B	C	D
Close-seeded legumes or rotated pasture	Straight row	Poor		66	77	85	89
		Good		58	72	81	85
	Contoured	Poor		64	75	83	85
		Good		55	69	78	83
	Contoured and terraced	Poor		63	73	80	83
		Good		51	67	76	80
Cultivated land	Without conservation treatment			72	81	88	91
	With conservation treatment			62	71	78	81
Fallow	Bare soil			77	86	91	94
	Crop residue cover	Poor		76	85	90	92
		Good		74	83	88	90
Farmsteads (buildings, lanes, driveways, and surrounding lots)				59	74	82	86
Irrigated pasture		Poor		58	74	83	87
		Fair		44	65	77	82
		Good		33	58	72	79
Orchards (deciduous)		(see glossary description)					
Orchards (evergreen)		Poor		57	73	82 Ex	86
		Fair		44	65	77	82
		Good		33	58	72	79
Row crops	Straight row	Poor		72	81	88	91
		Good		67	78	85	89
	Contoured	Poor		70	79	84	88
		Good		65	75	82 Ex	86

Table 4-2
RUNOFF CURVE NUMBERS[1] FOR PZN CONDITION = 2.0

Cover Description	Cover Treatment or Practice[2]	Hydrologic Condition[3]	Average Percent Impervious Area[4]	Curve Numbers for Hydrologic Soil Groups: A	B	C	D
Developing urban areas and newly graded areas (pervious areas only, no vegetation)				77	86	91	94
Impervious areas: Paved parking lots, roofs, and driveways (excluding right-of-way)				98	98	98	98
Residential districts by average lot size:[4]							
1/8 acre or less (town houses)			65%	77	85	90 post	92
1/4 acre			38%	61	75	83	87
1/3 acre			30%	57	72	81	86
1/2 acre			25%	54	70	80	85
1 acre			20%	51	68	79	84
2 acres			12%	46	65	77	82
Streets and roads	Paved; curbs and storm drains (excluding right-of-way)			98	98	98	98
	Paved; open ditches (including right-of-way)			83	89	92	93
	Gravel (including right-of-way)			76	85	89	91
	Hard surface (including right-of-way)			74	84	90 post	92
	Dirt (including right-of-way)			72	82	87	89
Urban districts[4]	Commercial and business		85%	89	92	94	95
	Industrial		72%	81	88	91	93
Western desert urban areas:							
Natural desert landscaping (pervious areas only)[5]				63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)				96	96	96	96

$C_n = 87.$

HYDROLOGY MAPS