A CEQA LEVEL OF PRELIMINARY DRAINAGE REPORT FOR:

LILAC HILLS RANCH MASTER TM TM 5571 RPL-3

San Diego County, California

PREPARED FOR:

Accretive Investments, Inc
12275 El Camino Real, Suite 110
San Diego, Ca 92130

PREPARED BY:

Landmark Consulting
9555 Genesee Ave. Ste. 200
San Diego, Ca 92121
858-587-8070

Rev. Date: 5-3-13

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

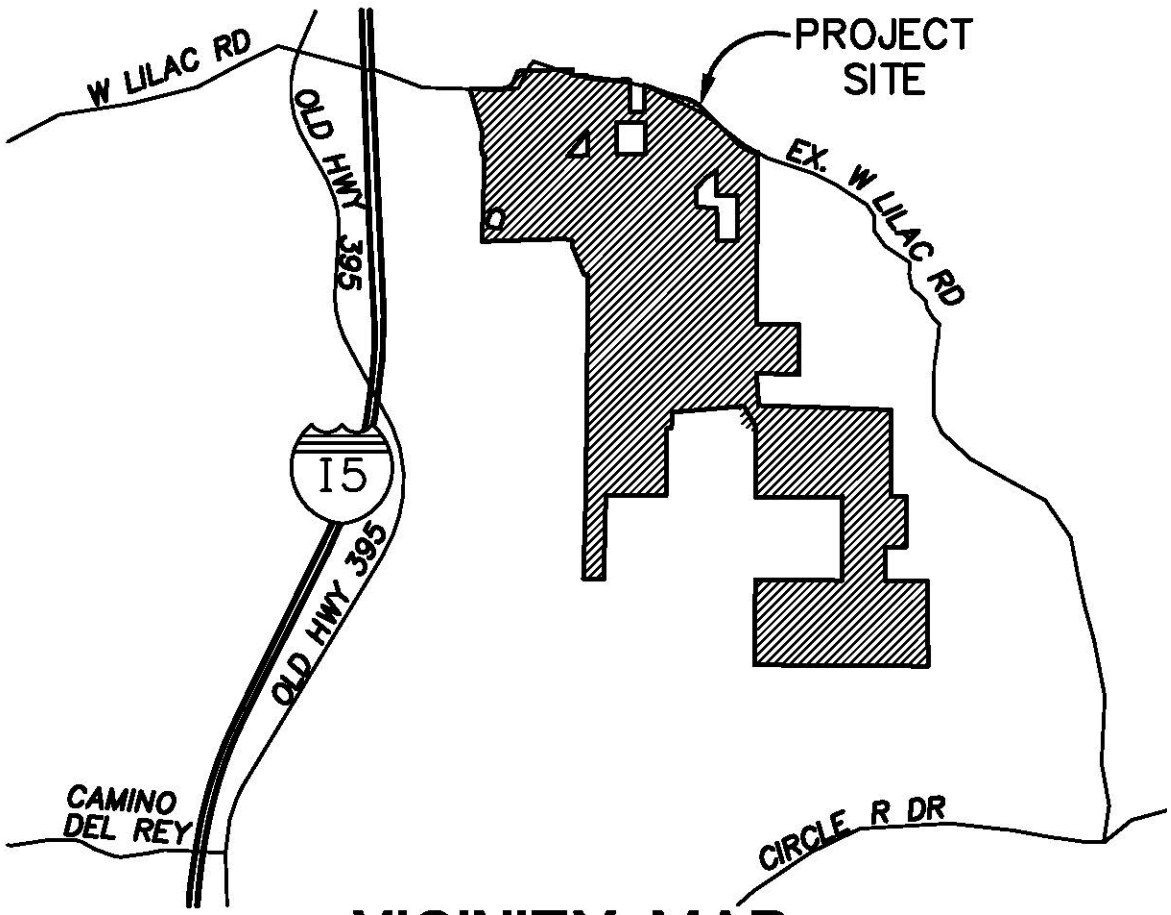
TABLE OF CONTENTS

	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 (Σ[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 223	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

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

            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:

                                 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 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.*

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

```
****************************************************************************
  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 <<<<<
```

```
==========================================================================

**************************************************************************
  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:

                                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 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

                     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 TM                                                  *
* PRELIMINARY HYDROGRAPH                                                *
* PRE-DEVELOPMENT, 100-YEAR STORM                                       *
 **************************************************************************

  FILE NAME: 1037EXH.DAT
  TIME/DATE OF STUDY: 12:33 02/17/2012
```

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

```
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      91.9159
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     320.2163
-------------------------------------------------------------------------------
```

==========

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.	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
```

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

==========

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.	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	.	.	.	.

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	.	.	.	.

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 . . .

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 .

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.

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.

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

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

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

==========

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.	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	.	.	.	.

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	.	.	.	.

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 . .

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 .

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.

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

```
        7                0.002                7.515
        8                0.000                0.000


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

         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
--------------------------------------------------------------------------------
```

==========

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.	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	.	.	.	.

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.	.	.	.	.

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	.

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.

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

```
--------------------------------------------------------------------------

         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
--------------------------------------------------------------------------
```

==========

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.	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	.	.	.	.

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	.	.	.	.

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

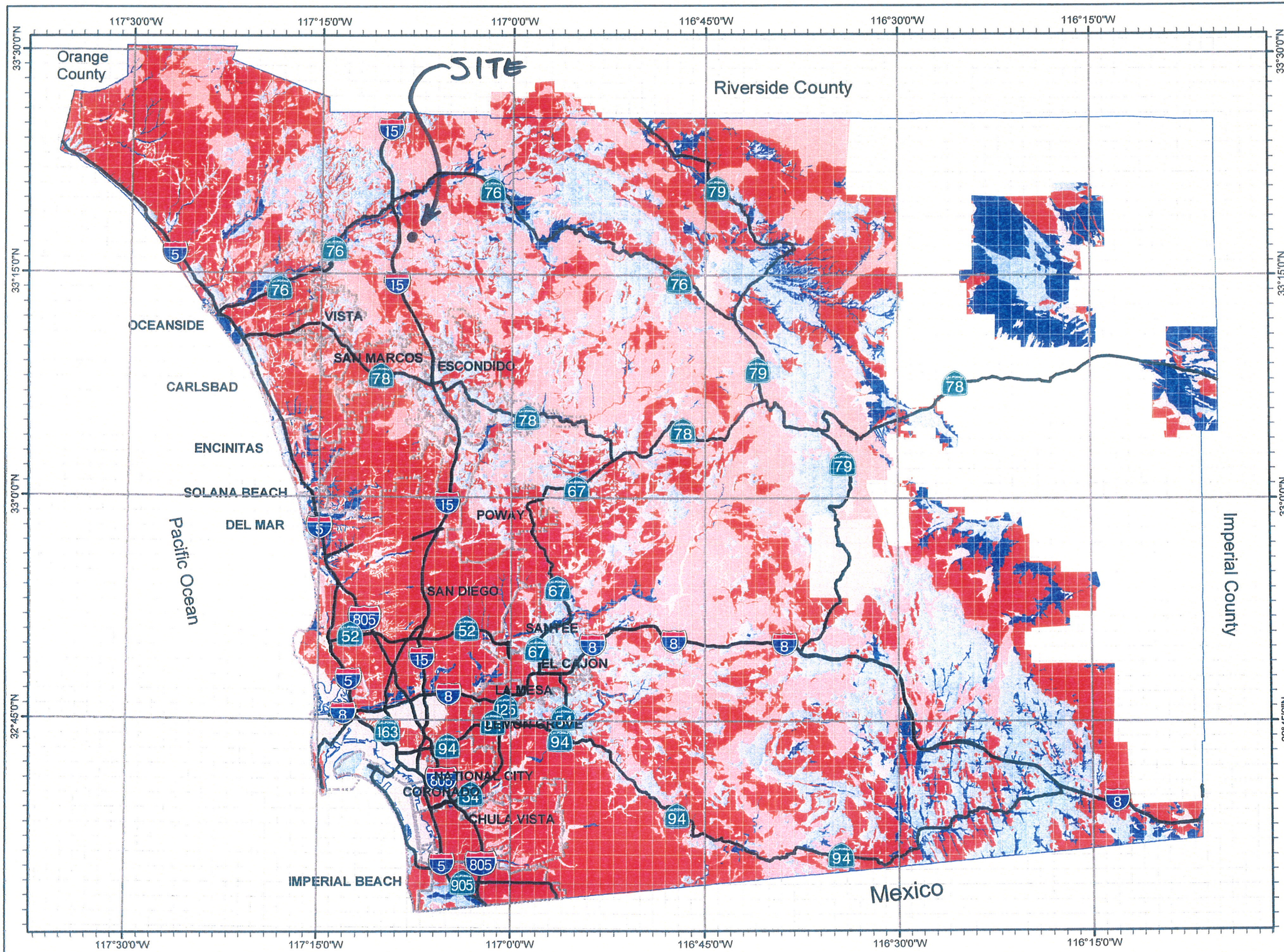
Project Description	
Worksheet	CURB OUTLET
Flow Element	Rectangular Cha
Method	Manning's Form
Solve For	Channel Depth

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

SanGIS

THIS MAP IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
Copyright SanGIS. All Rights Reserved.

This product may contain information from the SANDAG Regional Information System which cannot be reproduced without the written permission of SANDAG.

This product may contain information which has been reproduced with permission granted by Thomas Brothers Maps.

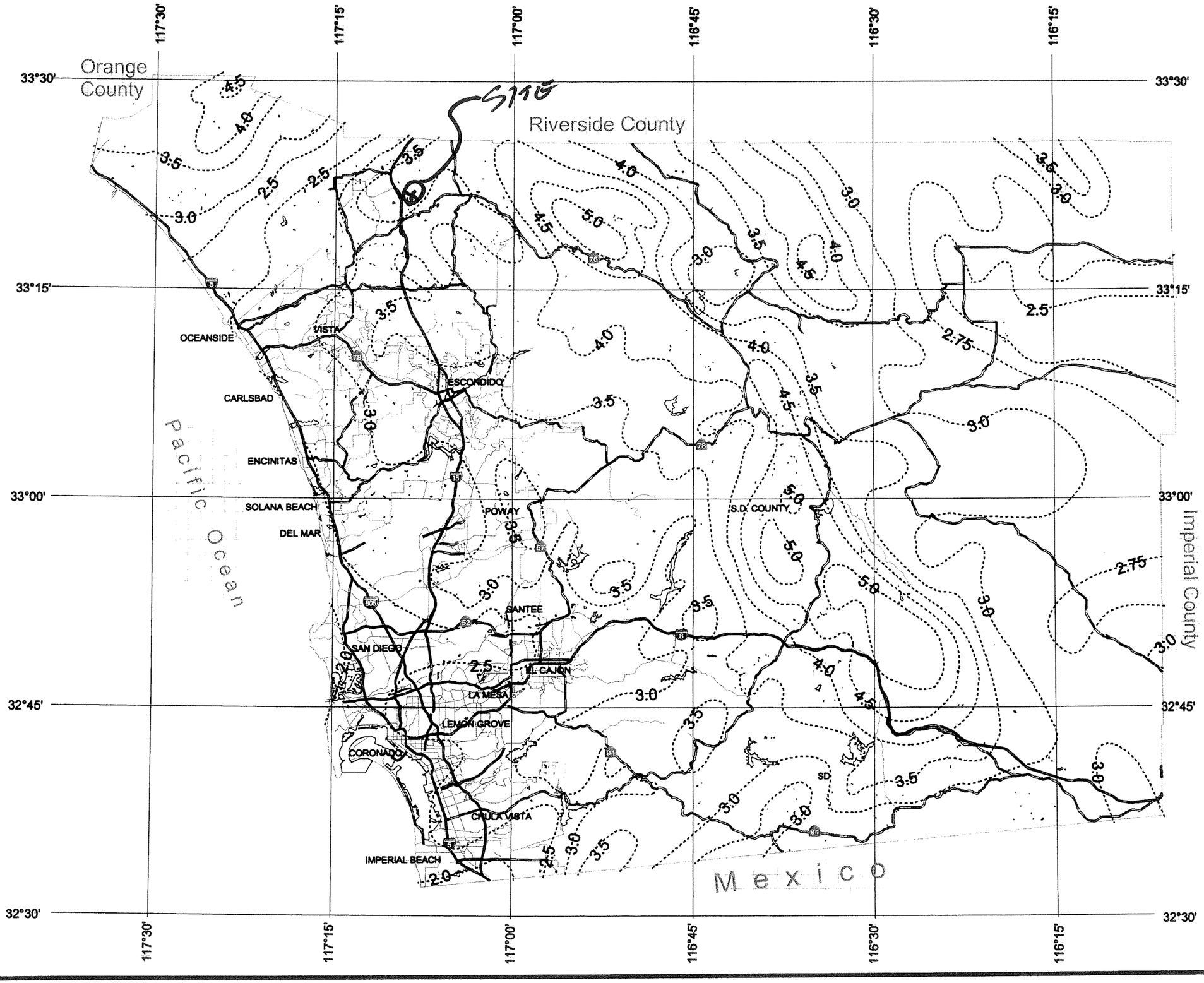
County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

6 = 3.5 in



DPW GIS
Department of Public Works Geographic Information Services

SanGIS
We Have San Diego Covered

THIS MAP IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EX
OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANT
OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
Copyright SanGIS. All Rights Reserved.

This products may contain information from the SANDAG Regional Information System which cannot be reproduced without the written permission of SANDAG.

This product may contain information which has been reproduced with permission granted by Thomas Brothers Maps.

N W E S

3 0 3 Miles

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)				Ex	
Orchards (evergreen)		Poor		57	73	82	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

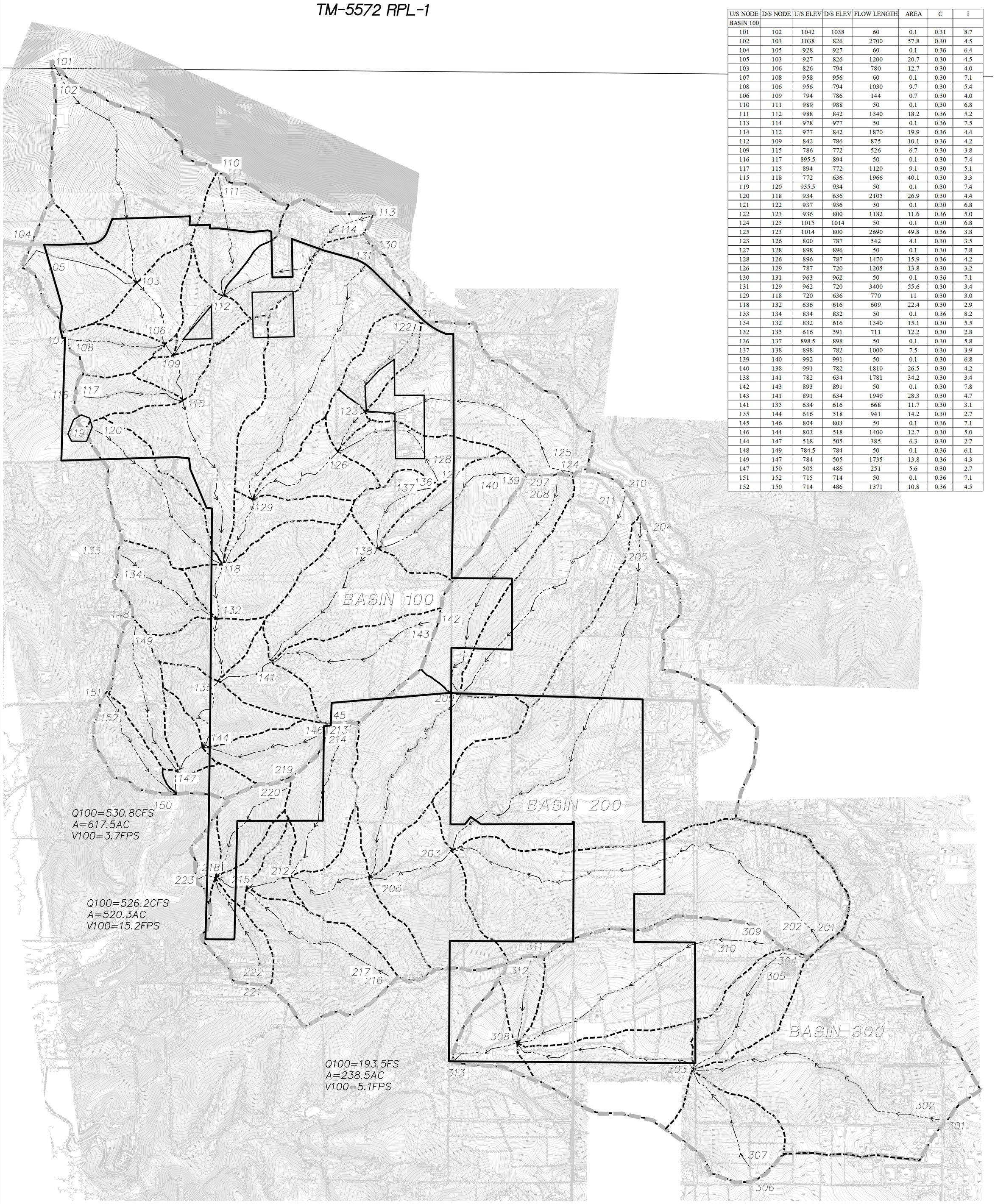
Table 4-2
RUNOFF CURVE NUMBERS[1] FOR PZN CONDITION = 2.0

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]						post	
1/8 acre or less (town houses)			65%	77	85	90	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

PRE-DEVELOPMENT HYDROLOGY MAP
LILAC HILLS RANCH
TM-5572 RPL-1



U/S NODE	D/S NODE	U/S ELEV	D/S ELEV	FLOW LENGTH	AREA	C	I
BASIN 100							
101	102	1042	1038	60	0.1	0.31	8.7
102	103	1038	826	2700	57.8	0.30	4.5
104	105	928	927	60	0.1	0.36	6.4
105	103	927	826	1200	20.7	0.30	4.5
103	106	826	794	780	12.7	0.30	4.0
107	108	958	956	60	0.1	0.30	7.1
108	106	956	794	1030	9.7	0.30	5.4
106	109	794	786	144	0.7	0.30	4.0
110	111	989	988	50	0.1	0.30	6.8
111	112	988	842	1340	18.2	0.36	5.2
113	114	978	977	50	0.1	0.36	7.5
114	112	977	842	1870	19.9	0.36	4.4
112	109	842	786	875	10.1	0.36	4.2
109	115	786	772	526	6.7	0.30	3.8
116	117	895.5	894	50	0.1	0.30	7.4
117	115	894	772	1120	9.1	0.30	5.1
115	118	772	636	1966	40.1	0.30	3.3
119	120	935.5	934	50	0.1	0.30	7.4
120	118	934	636	2105	26.9	0.30	4.4
121	122	937	936	50	0.1	0.30	6.8
122	123	936	800	1182	11.6	0.36	5.0
124	125	1015	1014	50	0.1	0.30	6.8
125	123	1014	800	2690	49.8	0.36	3.8
123	126	800	787	542	4.1	0.30	3.5
127	128	898	896	50	0.1	0.30	7.8
128	126	896	787	1470	15.9	0.36	4.2
126	129	787	720	1205	13.8	0.30	3.2
130	131	963	962	50	0.1	0.36	7.1
131	129	962	720	3400	55.6	0.30	3.4
129	118	720	636	770	11	0.30	3.0
118	132	636	616	609	22.4	0.30	2.9
133	134	834	832	50	0.1	0.36	8.2
134	132	832	616	1340	15.1	0.30	5.5
132	135	616	591	711	12.2	0.30	2.8
136	137	898.5	898	50	0.1	0.30	5.8
137	138	898	782	1000	7.5	0.30	3.9
139	140	992	991	50	0.1	0.30	6.8
140	138	991	782	1810	26.5	0.30	4.2
138	141	782	634	1781	34.2	0.30	3.4
142	143	893	891	50	0.1	0.30	7.8
143	141	891	634	1940	28.3	0.30	4.7
141	135	634	616	668	11.7	0.30	3.1
135	144	616	518	941	14.2	0.30	2.7
145	146	804	803	50	0.1	0.36	7.1
146	144	803	518	1400	12.7	0.30	5.0
144	147	518	505	385	6.3	0.30	2.7
148	149	784.5	784	50	0.1	0.36	6.1
149	147	784	505	1735	13.8	0.36	4.3
147	150	505	486	251	5.6	0.30	2.7
151	152	715	714	50	0.1	0.36	7.1
152	150	714	486	1371	10.8	0.36	4.5

LEGEND

PROJECT BOUNDARY

MAJOR BASIN BOUNDARY

TRIBUTARY AREA BOUNDAY

FLOW PATH

NODE NUMBER 101

U/S NODE	D/S NODE	U/S ELEV	D/S ELEV	FLOW LENGTH	AREA	C	I
BASIN 200							
201	202	1071	1070	50	0.1	0.36	7.1
202	203	1070	696	4830	99.9	0.36	2.6
204	205	994.5	994	50	0.1	0.81	9.2
205	203	994	696	4650	147	0.30	3.9
203	206	696	644	1029	30.7	0.30	3.5
207	208	983	982	50	0.1	0.30	6.8
208	209	982	784	2730	31.4	0.30	3.1
210	211	1014	1012	50	0.1	0.36	8.2
211	209	1012	784	2950	53.9	0.30	3.7
209	206	784	644	2504	46.1	0.30	2.9
206	212	644	584	1033	21.2	0.30	3.3
213	214	822.5	822	50	0.1	0.30	5.8
214	212	822	644	1877	21	0.30	3.6
212	215	644	533	470	5.7	0.30	3.3
216	217	859	858	50	0.1	0.30	6.8
217	215	585	533	1930	30.8	0.30	4.4
215	218	533	482	370	5	0.30	3.2
219	220	752	750	50	0.1	0.30	7.8
220	218	750	482	1340	11.1	0.30	5.0
221	222	753	751	50	0.1	0.81	9.2
222	218	751	533	1189	11.7	0.30	7.6
218	223	533	468	246	4	0.30	3.2

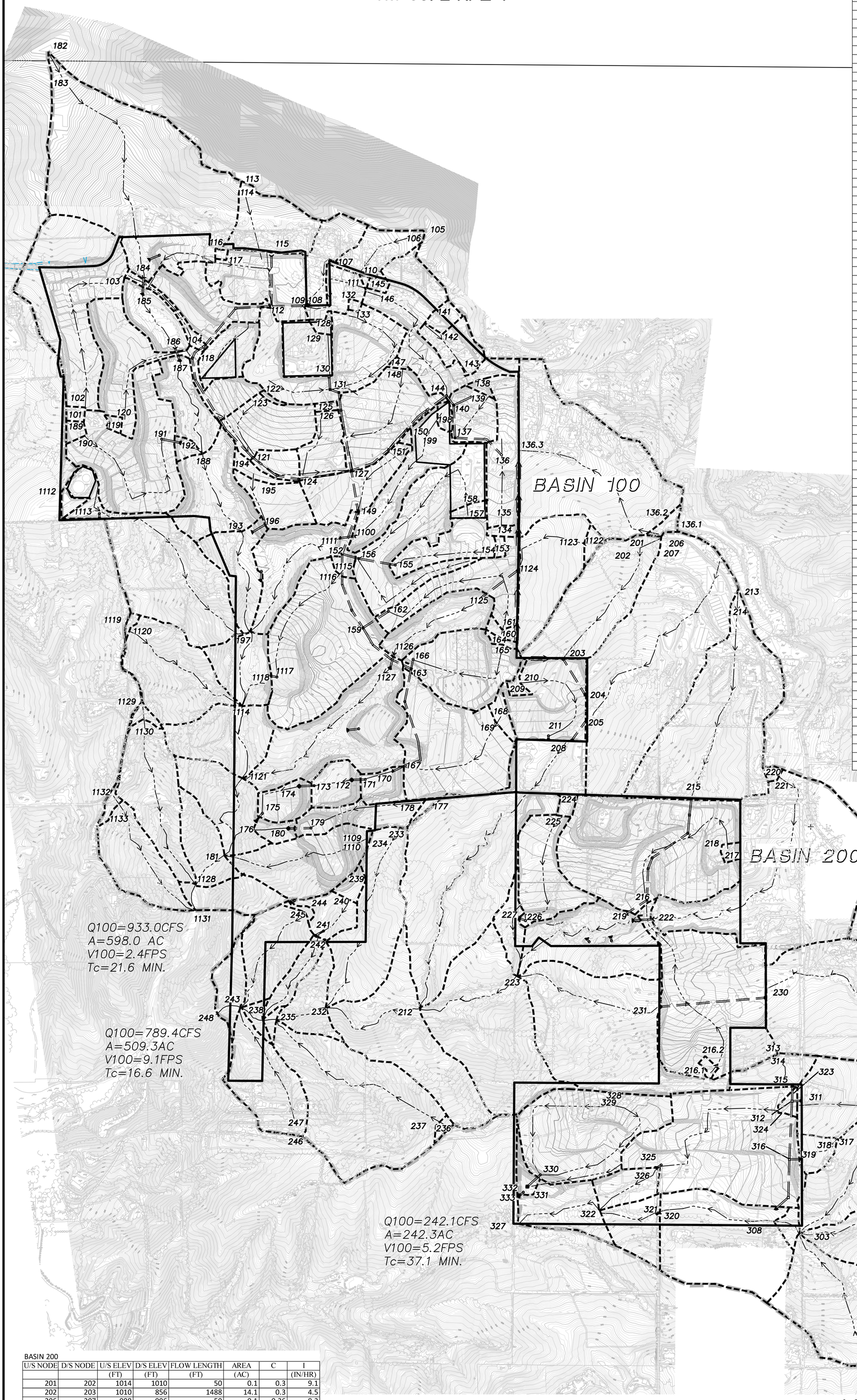
U/S NODE	D/S NODE	U/S ELEV	D/S ELEV	FLOW LENGTH	AREA	C	I
BASIN 300							
301	302	1072	1071	50	0.1	0.36	7.1
302	303	1071	880	3039	89.9	0.30	3.5
304	305	1073	1071	50	0.1	0.36	8.2
305	303	1071	880	1937	19.1	0.30	4.1
306	307	1016	1014	50	0.1	0.30	7.8
307	303	1014	880	1283	20.2	0.30	5.4
303	308	880	820	2084	32.8	0.36	2.7
309	310	1026	1025	50	0.1	0.36	7.1
310	308	1025	820	3025	58.6	0.30	3.7
311	312	931	930	50	0.1	0.36	7.1
312	308	930	820	910	7.2	0.30	5.1
308	313	820	786	740	10.2	0.30	2.6

SCALE: 1"= 500'

LANDMARK
CONSULTING
Planning Engineering Surveying
9555 Genesee Avenue, Suite 200
San Diego, CA 92121, (858) 587-8070

J.N.: 103-7

POST-DEVELOPMENT HYDROLOGY MAP
LILAC HILLS RANCH
TM-5572 RPL-1



BASIN 100

U/S NODE	D/S NODE	U/S ELEV (FT)	D/S ELEV (FT)	FLOW LENGTH (FT)	AREA (AC)	C	I (IN/HR)
101	102	926	925.5	50	0.1	0.54	7.3
102	103	925.5	864	1664	24.9	0.54	5.5
103	104	864	828	931	1.1	0.87	5
105	106	980	970	50	0.1	0.3	9.2
106	107	970	920	1070	4.9	0.36	5
107	108	920	896	430	5.6	0.36	4.4
110	111	926	925	50	0.1	0.54	8.5
111	109	925	896	835	3.4	0.54	5.9
113	114	990	980	980	0.1	0.3	9.2
114	115	980	910	690	9.0	0.36	6.2
116	117	918	917	50	0.1	0.54	8.5
117	112	915	882	791	10.5	0.54	6.8
119	120	898	897	50	0.1	0.54	8.5
120	118	896	824	1098	20.2	0.54	6.9
122	123	880	860	40	0.1	0.78	9.2
123	121	860	816	683	8.3	0.78	9.2
125	126	860	854	50	0.1	0.78	9.2
126	124	854	812	603	5.0	0.78	9.2
128	129	930	928	50	0.1	0.36	8.2
129	130	928	886	400	5.0	0.36	7.1
132	133	916	915	50	0.1	0.54	7.3
133	131	914	864	1284	17.0	0.54	5.7
134	135	886	882	50	0.1	0.54	9.2
135	136	882	856	808	8.7	0.54	8
136.1	136.2	1015	1014	50	0.1	0.36	7.1
136.2	136.3	1014	862	1683	36.5	0.36	4.1
138	139	882	880	50	0.1	0.54	9.2
139	137	880	854	500	4.6	0.54	7.9
141	142	930	928	50	0.1	0.36	8.2
142	143	928	906	592	4.6	0.36	6.3
145	146	926	925	50	0.1	0.54	8.5
146	144	924	886	1420	14.2	0.54	5.8
147	148	880	876	50	0.1	0.78	9.2
148	127	876	806	1277	12.9	0.78	9.2
150	151	846	844	50	0.1	0.78	9.2
151	149	844	796	796	8.2	0.78	9.2
153	154	886	884	50	0.1	0.54	9.2
154	155	884	860	950	6.5	0.54	6.6
157	158	874	872	50	0.1	0.36	8.2
158	156	872	821	1722	19.4	0.3	5.2
160	161	884	882	50	0.1	0.54	9.2
161	162	882	822	1740	10.0	0.54	5.8
164	165	884	882	50	0.1	0.54	9.2
165	166	882	804	1095	12.7	0.54	7.4
168	169	836	834	50	0.1	0.78	9.2
169	167	834	790	1250	21.3	0.78	9.2
170	171	738	736	280	2.8	0.78	4
172	173	702	696	381	4.0	0.3	3.9
174	175	658	644	515	3.5	0.3	3.8
177	178	830	828	50	0.1	0.3	7.8
178	179	828	714	1062	6.0	0.3	3.9
180	176	660	612	303	1.6	0.3	3.7
182	183	1042	1038	60	0.1	0.36	8.7
183	184	1038	840	2464	48.0	0.3	4.2
185	186	832	820	656	5.8	0.3	3.7
187	188	806	770	608	6.8	0.3	3.4
189	190	924	922	50	0.1	0.54	9.2
190	191	920	826	1612	20.5	0.54	6.9
192	188	792	770	212	0.7	0.3	6.6
188	193	770	730	845	11.7	0.3	3.1
194	195	816	814	50	0.1	0.78	9.2
195	196	814	806	495	5.7	0.78	9.2
193	197	730	640	1009	7.7	0.3	3
198	199	878	876	50	0.1	0.3	7.8
199	1100	876	772	1442	10.2	0.3	3.4
1111	197	754	640	1342	11.2	0.3	2.7
1112	1113	920	916	50	0.1	0.3	9.1
1113	197	916	640	2247	25	0.3	4.5
197	1114	640	616	743	7.3	0.3	2.8
1115	1116	784	780	50	0.1	0.54	9.2
1116	1117	780	682	1265	26.6	0.54	8.6
1119	1120	832	830	50	0.1	0.3	7.8
1120	1114	830	616	1345	14.9	0.3	5.3
1114	1121	616	592	716	11	0.3	2.7
1122	1123	922	920	50	0.1	0.3	7.8
1123	1124	920	865	1096	13.4	0.3	4.5
1125	1126	808	762	1047	7.7	0.3	3.7
1127	1121	746	592	1877	21.8	0.3	2.9
1121	181	592	520	970	9.9	0.3	2.6
181	1128	520	504	396	6.4	0.3	3.6
1129	1130	784	782	50	0.1	0.3	7.8
1130	1128	782	504	1810	13.7	0.3	4.6
1128	1131	504	486	229	5.5	0.3	3.6
1132	1133	714	712	50	0.1	0.3	7.8
1133	1131	712	486	1371	10.8	0.3	4.4
					598.0		

BASIN 200

U/S NODE	D/S NODE	U/S ELEV (FT)	D/S ELEV (FT)	FLOW LENGTH (FT)	AREA (AC)	C	I (IN/HR)
201	202	1014	1010	50	0.1	0.3	9.1
202	203	1010	856	1488	14.1	0.3	4.5
206	207	998	996	50	0.1	0.36	8.2
207	205	996	820	2010	44.9	0.3	3.9
209	210	866	864	50	0.1	0.54	9.2
210	211	864	828	1084	11.8	0.54	7
208	212	806	644	2232	45	0.3	3.1
213	214	992	990	50	0.1	0.36	8.2
214	215	990	832	2032	34.1	0.3	3.9
217	218	872	870	50	0.1	0.54	9.2
218	216	870	798	1499	35	0.54	7.4
216.1	216.2	914	912	50	0.1	0.54	9.2
216.2	216	912	798	1893	29.5	0.54	6.9
220	221	921	920	50	0.1	0.36	7.1
221	222	920	778	2501	46.2	0.3	3.2
219	223	768	696	1523	15.9	0.3	5.5
224	225	840	838	50	0.1	0.78	9.2
225	226	838	760	1181	10.4	0.78	9.2
227	223	750	696	726	3.3	0.3	7.1
228	229	1076	1074	50	0.1	0.36	8.2
229	230	1074	858	2289	48.7	0.3	3.4
231	223	828	696	1431	31.7	0.3	2.8
223	212	696	644	1040	28.1	0.3	5
212	232	644	582	1041	21.3	0.3	4.5
233	234	820	816	50	0.1	0.36	9.2
234	232	816	582	1931	17.1	0.3	4.3
232	235	582	534	474	5.6	0.3	4.4
236	237	858	854	50	0.1	0.3	9.1
237	235	854	534	1938	30.6	0.3	5.2
235	238	534	526	125	0.6	0.3	4.4
239	240	748	740	100	0.5	0.78	9.2
240	241	740	700	407	4.2	0.78	9.2
242	238	690	526	993	3	0.3	7.2
238	243	526	482	262	1.1	0.3	4.3
244	245	708	700	50	0.1	0.3	9.2
245	243	700	482	1156	9.3	0.3	4.9
246	247	750	746	50	0.1	0.54	9.2
247	243	746	482	1189	12.0	0.3	5.5
243	248	482	470	250	4.0	0.3	4.2
					509.3		

BASIN 300

U/S NODE	D/S NODE	U/S ELEV (FT)	D/S ELEV (FT)	FLOW LENGTH (FT)	AREA (AC)	C	I (IN/HR)
301	302	1072	1071	50	0.1	0.36	7.1
302	303	1071	880	3039	89.9	0.3	3.5
304	305	1073	1071	50	0.1	0.36	8.2
305	303	1071	880	1937	19.1	0.3	4.1
306	307	1016	1014	50	0.1	0.3	7.8
307	303	1014	880	1283	20.2	0.3	5.4
303	308	880	872	280	1.1	0.3	3.3
309	310	1024	1022	50	0.1	0.36	8.2
310	311	1022	912	916	11.5	0.3	5.5
313	314	944	942	50	0.1	0.36	8.2
314	315	942	908	312	4.4	0.3	6.7
317	318	984	982	50	0.1	0.3	7.8
318	319	982	936	383	2.2	0.3	5.9
308	320	872	846	1088	22.6	0.3	2.9
321	322	845	825	556	5.6	0.3	2.7
323	324	906	904	50	0.1	0.54	9.2
324	325	904	856	1547	31	0.54	6.9
326	322	848	825	659	4.1	0.3	5.9
322	327	825	786	847	7.4	0.3	2.5
328	329	912	910	50	0.1	0.54	9.2
329	330	910	830	1432	21	0.54	7.2
331	332	810	809.5	90	1.4	0.3	6.7
					242.3		

LEGEND

MAJOR BASIN BOUNDARY

TRIBUTARY AREA BOUNDAY

FLOW PATH

NODE NUMBER 101

SCALE: 1"= 500'

LANDMARK CONSULTING
Planning Engineering Surveying
9555 Genesee Avenue, Suite 200
San Diego, CA 92121, (858) 587-8070

J.N.: 103-7

ADDENDUM

Even though this Master TM does not proposed any paved roads and building construction, the post-development condition hydrology analysis took into consideration the future built-out conditions of the project in determination of the post-development runoff rate and volume and subsequently the sizing the proposed detention basins.

ALTERNATIVE TO DETENTION BASINS

The developer has proposed a few alternative measures to augment or enhance the storm water runoff volume attenuation methods. In recent years, new technologies have become available to better retain and store excess runoff volume such as rain barrels, bio-retention and permeable pavers. These rain capturing measures will not only reduce the project's hydrologic and subsequent development footprint but they will also reduce the water demand of this project since the captured runoff could be used for irrigation. With these alternative runoff volume attenuation measures, the project could eliminate the proposed large detention basins and possibly to reduce the overall project disturbance footprint

ASSUMPTIONS:

Bio-retention:

-Average lot size = 4500 sf

-Average impervious coverage per lot = 1500 sf roof + 300 sf walkways and driveway = 1800 sf

-Typical pervious coverage (bio-retention) per lot = 1000 sf with the top 12" layer providing a minimum of 5"/hour infiltration rate.

-Typical void ratio of engineered infiltration material = 0.55

Rain barrels:

-Typical home rain gutter down spout location = 4

-Typical rain barrel capacity = 50 gal.

Permeable pavers (see page 195 for typical section):

-Typical permeable paver section: 2" bedding+4" no. 57 stone base + 24" no.2 stone subbase

- Average permeable paver base void ratio = 0.4

- Average storage volume under each squire foot of pavers = 1.0 cf

Project design:

-Proposed residential units = 1746

ANALYSIS:

Typical Lot rainwater capturing/retention calculations:

Bio-retention volume per typical home:1000 sf x 12”/12 x 0.55 void ratio = 550 cf.

Total bio-retention vol. = 550 cf x 1746 residential units= 960300 cf = **22.0 Ac-Ft.**

Rain barrel capacity = 4 x 50gal = 200 gal = 27 cf

Total rain barrel capturing capacity = 27 cf x 1746 residential units = 47140 cf = **1.1 Ac-Ft.**

Total lot rain capturing capacity for the development = 22.0 + 1.1 = **23.1 Ac-Ft.**

Permeable Pavers:

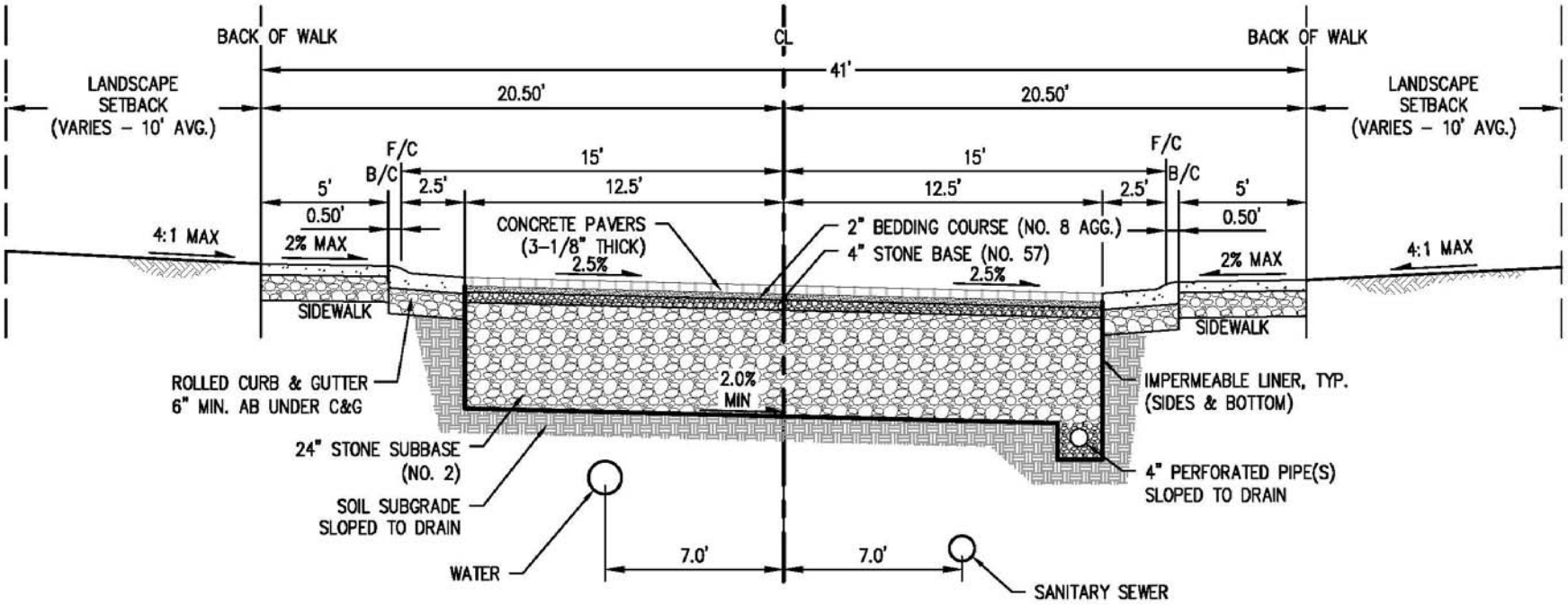
The developer proposes to install a total of 23 acres of permeable pavers throughout the entire project that will provide 23 Ac-Ft of storage space. The project will need a total of 36.0 Ac-Ft of storage space for 100-year runoff volume attenuation.

Total alternative storage capacity = rain barrels + bio-retention + permeable pavers = 23.1 + 23 = **46.1 Ac-Ft.**

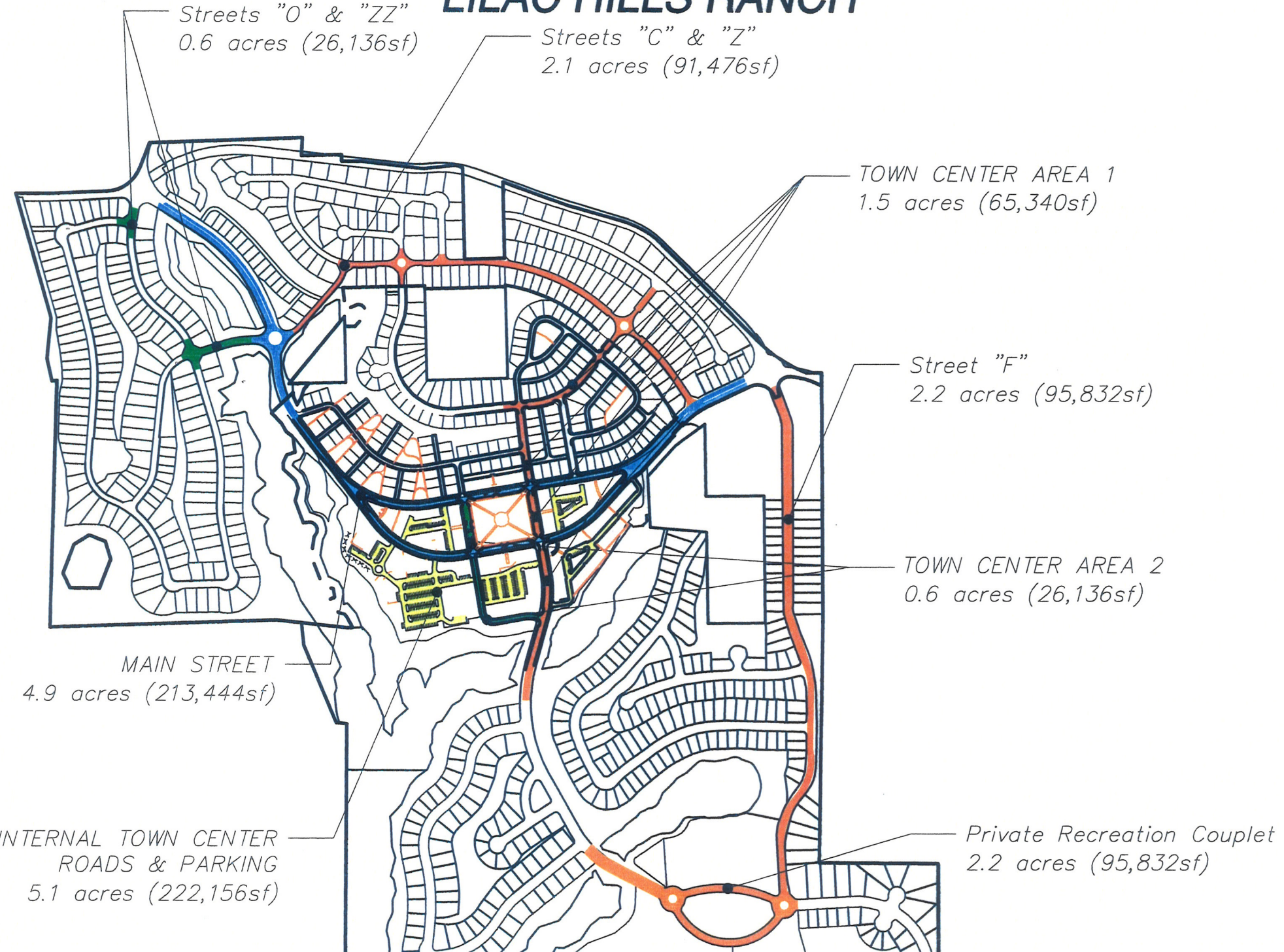
CONCLUSION:

These permeable pavers, bio-retention and rain barrels offer a great alternative to the proposed detention basins for 100-year runoff volume attenuation.

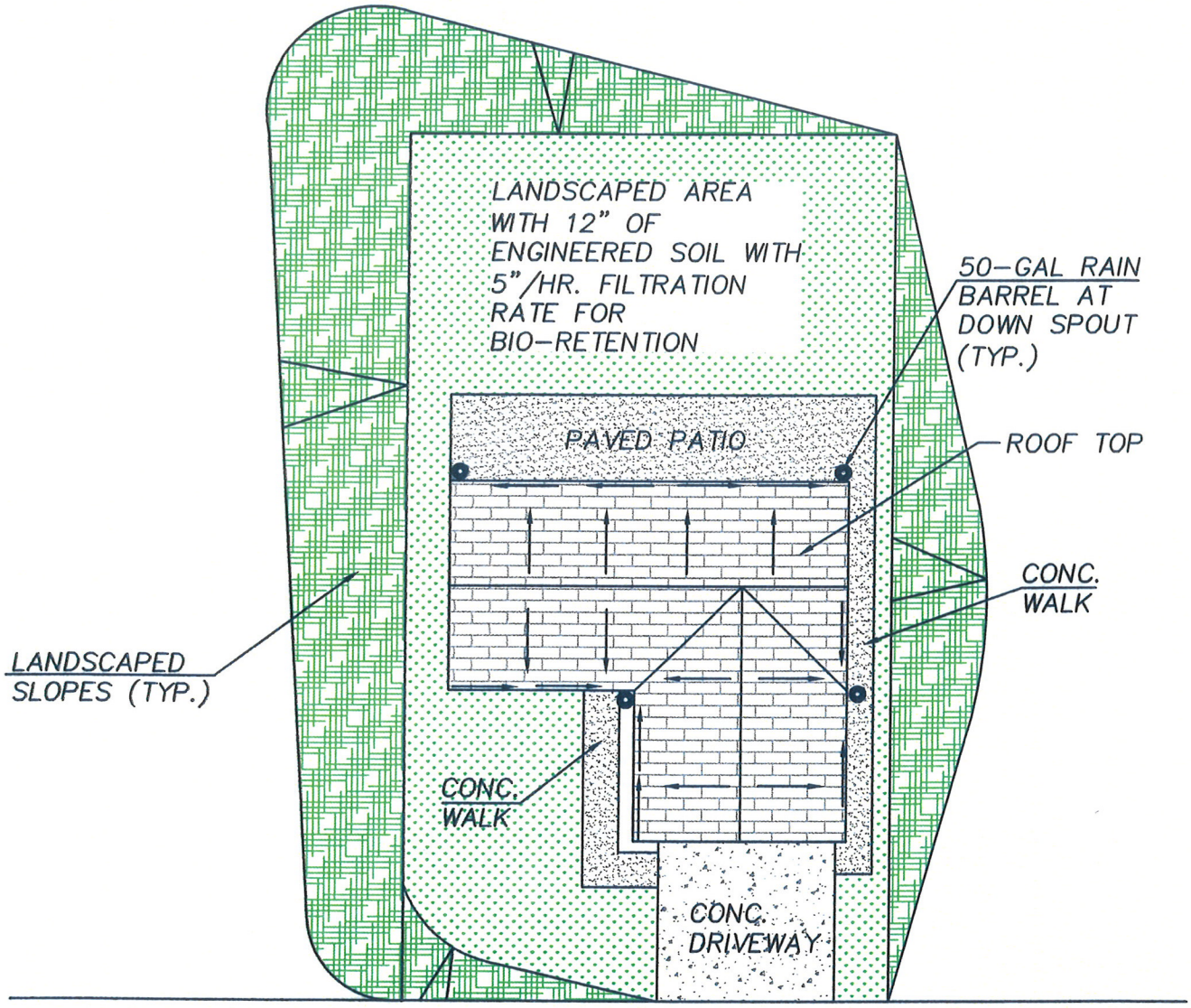
The project developers projected a total of 23 acres of pavers throughout the project. Per the calculations presented in this report, the proposed rain barrels, bio-retention areas and permeable pavers will provide adequate storage capacity to eliminate the required detention basin for 100-year storm water runoff volume attenuation purposes. It is possible to eliminate the proposed large detention basins and reduce the project foot print with the deployment of these alternative methods. Additionally, the captured rainwater in the bio-retention areas and rain barrels will offset the irrigation water demand of the project to make it a more sustainable development.


BACK OF WALK
CL
BACK OF WALK
41'
LANDSCAPE SETBACK (VARIES – 10' AVG.)
20.50'
20.50'
LANDSCAPE SETBACK (VARIES – 10' AVG.)
F/C
B/C
15'
15'
F/C
B/C
5'
2.5'
12.5'
12.5'
2.5'
5'
0.50'
0.50'
4:1 MAX
2% MAX
CONCRETE PAVERS (3-1/8" THICK)
2" BEDDING COURSE (NO. 8 AGG.)
4" STONE BASE (NO. 57)
2.5%
2.5%
2% MAX
4:1 MAX
SIDEWALK
SIDEWALK
ROLLED CURB & GUTTER
6" MIN. AB UNDER C&G
2.0% MIN
IMPERMEABLE LINER, TYP. (SIDES & BOTTOM)
24" STONE SUBBASE (NO. 2)
4" PERFORATED PIPE(S) SLOPED TO DRAIN
SOIL SUBGRADE SLOPED TO DRAIN
WATER
7.0'
7.0'
SANITARY SEWER

PERMEABLE PAVERS ANALYSIS
LILAC HILLS RANCH



LILAC HILLS RANCH
TYPICAL RESIDENTIAL LOT RAIN WATER CAPTURING SCHEMATIC



LANDMARK
CONSULTING
Planning Engineering Surveying
9555 Genesee Avenue, Suite 200
San Diego, CA 92121, (858) 587-8070