Watershed Divide

Design Point

L

Watershed Divide

Area "A"

ΔE

Effective Slope Line

Area "B"

Design Point (Watershed Outlet)

Stream Profile

L

Area "A" = Area "B"

FIGURE

Computation of Effective Slope for Natural Watersheds

3-5

Study Area SC

Study Area LA

1. Define Study Areas
(Two-Letter ID)

2. Define Major Flowpaths
in Study Area

3. Define Regions on
Study Area Basis

01   02

03

01

02

01   11

02   12

03

04

Subarea ID =
(LA010112)

Node # ——————
Map # ——————
Region # ——————
Study Area (ID) # ——————

LA 01 01 03

7. Number Nodes

4. Define Maps
(or Subregions
on Region Basis)

5. Define Model
Subareas on
Map Basis

6. Define Model Nodes
(Intersection of
Subarea Boundaries
with Flowpath Lines)

GIS/Hydrologic Model
Data Base Linkage Setup:
Nodes, Subareas, Links

FIGURE

3-8

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8. Determine the runoff coefficient (C) for each subarea based on Table 3-1. If the subarea contains more than one type of development classification, use a proportionate average for C. In determining C for the subarea, use future land use taken from the applicable community plan, Multiple Species Conservation Plan, National Forest land use plan, etc.

9. Calculate the CA value for the subarea.

10. Calculate the $\Sigma(CA)$ value(s) for the subareas upstream of the point(s) of interest.

11. Determine P_6 and P_{24} for the study using the isopluvial maps provided in Appendix B. If necessary, adjust the value for P_6 to be within 45% to 65% of the value for P_{24}.

See Section 3.3 for a description of the RM calculation process.

3.3 PERFORMING RATIONAL METHOD CALCULATIONS

This section describes the RM calculation process. Using the input data, calculation of peak flows and T_c's should be performed as follows:

1. Determine T_i for the first subarea. Use Table 3-2 or Figure 3-3 as discussed in Section 3.1.4. If the watershed is natural, the travel time to the downstream end of the first subarea can be added to T_i to obtain the T_c. Refer to paragraph 3.1.4.2 (a).

2. Determine I for the subarea using Figure 3-1. If T_i was less than 5 minutes, use the 5 minute time to determine intensity for calculating the flow.

3. Calculate the peak discharge flow rate for the subarea, where $Q_p = \Sigma(CA) I$.
   In case that the downstream flow rate is less than the upstream flow rate, due to the long travel time that is not offset by the additional subarea runoff, use the upstream peak flow for design purposes until downstream flows increase again.

3-22

4.   Estimate the T_t to the next point of interest.

5.   Add the T_t to the previous T_c to obtain a new T_c.

6.   Continue with step 2, above, until the final point of interest is reached.

Note: The MRM should be used to calculate the peak discharge when there is a junction from independent subareas into the drainage system.

3.4 MODIFIED RATIONAL METHOD (FOR JUNCTION ANALYSIS)

The purpose of this section is to describe the steps necessary to develop a hydrology report for a small watershed using the MRM. It is necessary to use the MRM if the watershed contains junctions of independent drainage systems. The process is based on the design manuals of the City/County of San Diego. The general process description for using this method, including an example of the application of this method, is described below.

The engineer should only use the MRM for drainage areas up to approximately 1 square mile in size. If the watershed will significantly exceed 1 square mile then the NRCS method described in Section 4 should be used. The engineer may choose to use either the RM or the MRM for calculations for up to an approximately 1-square-mile area and then transition the study to the NRCS method for additional downstream areas that exceed approximately 1 square mile. The transition process is described in Section 4.

3.4.1 Modified Rational Method General Process Description

The general process for the MRM differs from the RM only when a junction of independent drainage systems is reached. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction are calculated by the RM. The independent drainage systems are then combined using the MRM procedure described below. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction must be calculated prior to using the MRM procedure to combine the independent drainage systems, as these

values will be used for the MRM calculations. After the independent drainage systems have been combined, RM calculations are continued to the next point of interest.

3.4.2 Procedure for Combining Independent Drainage Systems at a Junction

Calculate the peak Q, T_c, and I for each of the independent drainage systems at the point of the junction. These values will be used for the MRM calculations.

At the junction of two or more independent drainage systems, the respective peak flows are combined to obtain the maximum flow out of the junction at T_c. Based on the approximation that total runoff increases directly in proportion to time, a general equation may be written to determine the maximum Q and its corresponding T_c using the peak Q, T_c, and I for each of the independent drainage systems at the point immediately before the junction. The general equation requires that contributing Q's be numbered in order of increasing T_c.

Let Q_1, T_1, and I_1 correspond to the tributary area with the shortest T_c. Likewise, let Q_2, T_2, and I_2 correspond to the tributary area with the next longer T_c; Q_3, T_3, and I_3 correspond to the tributary area with the next longer T_c; and so on. When only two independent drainage systems are combined, leave Q_3, T_3, and I_3 out of the equation. Combine the independent drainage systems using the junction equation below:

Junction Equation: $T_1 < T_2 < T_3$

$$Q_{T1} = Q_1 + \frac{T_1}{T_2} Q_2 + \frac{T_1}{T_3} Q_3$$

$$Q_{T2} = Q_2 + \frac{I_2}{I_1} Q_1 + \frac{T_2}{T_3} Q_3$$

$$Q_{T3} = Q_3 + \frac{I_3}{I_1} Q_1 + \frac{I_3}{I_2} Q_2$$

3-24

Calculate Q_{T1}, Q_{T2}, and Q_{T3}. Select the largest Q and use the T_c associated with that Q for further calculations (see the three Notes for options). If the largest calculated Q's are equal (e.g., $Q_{T1} = Q_{T2} > Q_{T3}$), use the shorter of the T_c's associated with that Q.

This equation may be expanded for a junction of more than three independent drainage systems using the same concept. The concept is that when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a shorter T_c (e.g., Q_1), the Q from the subarea with the shorter T_c is reduced by the ratio of the I's (I_2/I_1); and when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a longer T_c (e.g., Q_3), the Q from the subarea with the longer T_c is reduced by the ratio of the T_c's (T_2/T_3).

Note #1: At a junction of two independent drainage systems that have the same T_c, the tributary flows may be added to obtain the Q_p.

$$Q_p = Q_1 + Q_2; \text{ when } T_1 = T_2; \text{ and } T_c = T_1 = T_2$$

This can be verified by using the junction equation above. Let Q_3, T_3, and $I_3 = 0$. When T_1 and T_2 are the same, I_1 and I_2 are also the same, and T_1/T_2 and $I_2/I_1 = 1$. T_1/T_2 and I_2/I_1 are cancelled from the equations. At this point, $Q_{T1} = Q_{T2} = Q_1 + Q_2$.

Note #2: In the upstream part of a watershed, a conservative computation is acceptable. When the times of concentration (T_c's) are relatively close in magnitude (within 10%), use the shorter T_c for the intensity and the equation $Q = \Sigma(CA)I$.

Note #3: . An optional method of determining the T_c is to use the equation
$$T_c = [(\Sigma (CA)7.44 P_6)/Q]^{1.55}$$

This equation is from $Q = \Sigma(CA)I = \Sigma(CA)(7.44 P_6/T_c^{.645})$ and solving for T_c. The advantage in this option is that the T_c is consistent with the peak flow Q, and avoids inappropriate fluctuation in downstream flows in some cases.

3-25

CHAPTER 2 - METHODOLOGY

2.5 – Rational Method Hydrologic Analysis

2.5　Rational Method Hydrologic Analysis

Computer Software Package – AES-2010

Design Storm - 100-year return intervals

Land Use – Single Family/Multi Family development, Schools, Parks & Open Space.

Soil Type – Hydrologic soil group D was assumed for all areas. Group D soils have very slow infiltration rates when thoroughly wetted. Consisting chiefly of clay soils with a high swelling potential, soils with a high permanent water table, soils with clay pan or clay layer at or near the surface, and shallow soils over nearly impervious materials, Group D soils have a very slow rate of water transmission.

Runoff Coefficient – In accordance with the San Diego County Hydrology Manual (SDCHM) Standards, the C coefficient for natural and undeveloped areas is 0.35; the C coefficient for developed areas is a weighted factor of 0.35 (landscape in soil D) and 0.9 (impervious areas) as a function of the fraction of impervious areas (a_i expressed as a decimal value between 0 and 1) according to:

$C = 0.35(1-a_i) + 0.9a_i$

Rainfall Intensity - Initial time of concentration values were determined using the County of San Diego's overland flow nomograph for urban areas. Downstream T_c values are determined by adding the initial sub-basin time of concentration and the downstream routing time. Per SDCHM standards, intensity values were determined from the County of San Diego's Intensity-Duration equation.

Method of Analysis – The Rational Method is the most widely used hydrologic model for estimating peak runoff rates. Applied to small urban and semi-urban areas with drainage areas less than 0.5 square miles, the Rational Method relates storm rainfall intensity, a runoff coefficient, and drainage area to peak runoff rate. This relationship is expressed by the equation:

Q =　CIA

where:

Q =　The peak runoff rate in cubic feet per second at the point of analysis.

C =　A runoff coefficient representing the area - averaged ratio of runoff to rainfall intensity.

I =　The time-averaged rainfall intensity in inches per hour corresponding to the time of concentration.

A =　The drainage basin area in acres.

To perform a node-link study, the total watershed area is divided into subareas which discharge at designated nodes.

The procedure for the subarea summation model is as follows:

(1) Subdivide the watershed into an initial subarea (generally 1 lot in developed conditions or an area with a maximum overland flow length does not exceed values displayed in Table 3.2 of the SDCHM) and subsequent subareas, which are generally less than 10 acres in size. Assign upstream and downstream node numbers to each subarea.

(2) Estimate an initial T_c by using the appropriate nomograph or overland flow velocity estimation.

(3) Using the initial T_c, determine the corresponding values of I. Then Q = C I A.

(4) Using Q, estimate the travel time between this node and the next by Manning's equation as applied to the particular channel or conduit linking the two nodes. Then, repeat the calculation for Q based on the revised intensity (which is a function of the revised time of concentration)

The nodes are joined together by links, which may be street gutter flows, drainage swales, drainage ditches, pipe flow, or various channel flows. The AES-2010 computer subarea menu is as follows:

SUBAREA HYDROLOGIC PROCESS

1. Confluence analysis at node.
2. Initial subarea analysis (including time of concentration calculation).
3. Pipe flow travel time (computer estimated).
4. Pipe flow travel time (user specified).
5. Trapezoidal channel travel time.
6. Street flow analysis through subarea.
7. User - specified information at node.
8. Addition of subarea runoff to main line.
9. V-gutter flow through area.
10. Copy main stream data to memory bank
11. Confluence main stream data with a memory bank
12. Clear a memory bank

At the confluence point of two or more basins, the following procedure is used to combine peak flow rates to account for differences in the basin's times of concentration. This adjustment is based on the assumption that each basin's hydrographs are triangular in shape.

(1). If the collection streams have the same times of concentration, then the Q values are directly summed,

$Q_p = Q_a + Q_b$; $T_p = T_a = T_b$

(2). If the collection streams have different times of concentration, the smaller of the tributary Q values may be adjusted as follows:

(i). The most frequent case is where the collection stream with the longer time of concentration has the larger Q. The smaller Q value is adjusted by the ratio of rainfall intensities. $Q_p = Q_a + Q_b$ (I_a/I_b); $T_p = T_a$

(ii). In some cases, the collection stream with the shorter time of concentration has the larger Q. Then the smaller Q is adjusted by a ratio of the T values.

$$Q_p = Q_b + Q_a (T_b/T_a); \; T_p = T_b$$

For more than 3 peaks that have a confluence in a discharge area (for example, 23 peaks discharging at the same time in the Otay Reservoir) a similar logic but more complex approach is used:

If "N" peaks are at confluence, and "N" different times of concentration are analyzed, "N" confluence calculations are made at each of the "N" time of concentration values.

Peak flows are arranged from smaller to larger in terms of time of concentration and not in terms of value. For a time of concentration Tc_i belonging to a peak Q_i the peaks whose time of concentration is smaller than Tc_i are adjusted by intensity and the peaks whose time of concentration is larger than Tc_i are adjusted by a ratio of the Tc_i values. The total peak flow with the time of concentration Tc_i (denoted as QT_{Tci}) will be:

$$QT_{Tci} = Q_1 \cdot (I_i/I_1) + Q_2 \cdot (I_i/I_2) + \ldots + Q_i + Q_{i+1} (Tc_i/Tc_{i+1}) + \ldots + Q_N \cdot (Tc_i/Tc_N)$$

The confluence peak is chosen as the larger between QT_{Tc1}, QT_{Tc2}, ... , QT_{Tci}, QT_{Tci+1}, ... , QT_{TcN-1}, QT_{TcN}

CHAPTER 2 - METHODOLOGY

2.6 – NRCS Unit Hydrograph Hydrologic Analysis

2.6   NRCS Unit Hydrograph Hydrologic Analysis

The NRCS Unit Hydrograph is necessary for hydrologic analyses of watershed areas approximately one square mile and greater in size. The HEC-HMS Version 3.2 program was used to produce hydrographs using the Natural Resources Conservation Service (NRCS) Unit Hydrograph method for this study. HEC-HMS, developed by the United States Army Corps of Engineers' Hydrologic Engineering Center, simulates the surface runoff response of a watershed to precipitation by representing the basin as an interconnected system of hydrologic and hydraulic components.

The NRCS Unit Hydrograph calculations and input parameters follow the guidelines in Section 4 of the 2003 San Diego County Hydrology Manual (SDCHM). The input that was required to produce the hydrographs included rainfall depth, rainfall distribution, drainage basin area, precipitation loss data, and data to determine overland and channel routing information. Output from the model is presented in the form of hydrographs, which are curves relating runoff flowrates to elapsed time from the beginning of rainfall. Thus, the distribution of the entire runoff response is available for analysis.

Rainfall Distribution, Duration & Volume

Runoff for this analysis was generated using the County of San Diego's Nested Storm Hyetograph. The amount of rainfall to be distributed was obtained from the County of San Diego's rainfall isopluvial charts, which are located at the end of this section. This analysis models the 100-year return frequency rainfall event.

Rainfall Loss Criteria

To account for rainfall losses such as infiltration, interception and depression storage, the NRCS Curve Number method was selected. The NRCS method calculates the runoff volume and initial loss based on an empirical curve number, which is determined based on a basin's soil type and land use. All soils in this analysis were assumed to be type D, which are characterized as soils with very low infiltration rates and high runoff potential (typically clay soils).

Based on the 2003 County of San Diego Hydrology Manual, the project site is determined to be located in PZN of 1.5. According to Table 4-6 of the SDCHM, an adjusted PZN of 2.5 was used for 100-year analysis. The following curve numbers were selected corresponding to D type soil.

	PZN = 2.0	PZN = 2.5
Medium-Density Residential Areas	87	91
Open Space (parks, etc.)	81	86.5

To determine the curve number for a basin containing more than one of the preceding land uses, a composite curve number (weighted average) was calculated using a linear interpolation of the values in Table 4-10 from the SDCHM.

Basin Lag Time

Basin lag times were calculated for both existing and developed conditions based on relationships developed by the United States Army Corps of Engineers. The Corps lag time is defined as the elapsed time (in hours) from the beginning of unit effective rainfall to the instant that runoff hydrograph for a basin reaches 50 percent of the ultimate discharge volume. Per equation 4-17 from the County's Hydrology Manual, the lag time for a basin is calculated using the following empirical relationship.

$$\text{Lag Time (hours)} = 24 * n * [\ (\ L * L_c)/\ (\ (S)^{1/2})\ ]^{\ m}$$

n = basin factor
m = constant (0.38)
L = length of longest watercourse in miles
L_c = length along longest watercourse measured upstream to point opposite center of area (miles)
S = overall slope of longest watercourse (feet per mile)

The basin n factor is the visually estimated mean of the Mannings n values for all the channels within an area. Basin n factors are chosen according to the following criteria.

$n = 0.100$ The drainage area has extensive vegetation and streams that contain a large amount of brush, grass or other vegetation that slows flow velocity

$n = 0.050$ Drainage area is rugged, with sharp ridges and steep canyons through which watercourses meander around sharp bends, large boulders, and debris obstruction. The ground cover, excluding small areas of rock outcrops, includes considerable underbrush. No drainage improvements exist in the area.

$n = 0.030$ Drainage area is generally rolling, with rounded edges and moderate side slopes. Watercourses meander in fairly straight, unimproved channels with some boulders and debris. No drainage improvements exist in the area.

$n = 0.015$ Drainage area has fairly uniform, gentle slopes with most watercourses either improved or along paved streets. Ground cover consists of grass with appreciable areas developed to the extent that a large percentage of the area is impervious.

1937F

1945F

UPPER OTAY RESERVOIR

JAMUL CREEK

OTAY LAKES RD

OTAY RANCH VILLAGE 13

2175F

1939F

SALT CREEK

SAN DIEGO COUNTY

CHULA VISTA

LOWER OTAY RESERVOIR

2182F

2177F

2181F

PREPARED FOR:

FEMA FLOODPLAIN BOUNDARIES

SHEET

1

OF

1

H&A HUNSAKER & ASSOCIATES
SAN DIEGO, INC

PLANNING   9707 Waples Street
ENGINEERING   San Diego, Ca 92121
SURVEYING   PH(858)558-4500 · FX(858)558-1414

OTAY RANCH VILLAGE 13

COUNTY OF SAN DIEGO, CALIFORNIA

W.O. # 0025-0320

R:\0160\&Hyd\FEMA FLOODPLAIN.dwg[ ]Jan-15-2009; 10:00

63

CHAPTER 2 - METHODOLOGY

2.7 – Open Channel Inundation Calculations

2.7   Open Channel Inundation Calculations

Flowmaster software was used to perform 100-year inundation calculations for open channels with tributary areas greater than 25 acres. Input parameters included a channel roughness coefficient, slopes, bottom width, and discharge. Manning's formula was used as the friction method within the software, which then calculated the normal depth of flow for the channel. Cross sections of the channel were taken at the most downstream location, in order to provide a conservative flow depth. This resulting flow depth was conservatively assumed to be the flow depth along the length of the channel. Refer to Chapter 7.5 for results.

CHAPTER 3

100-Year Hydrologic Model
for
Existing Conditions

CHAPTER 3

100-Year Hydrologic Model
for
Existing Conditions

3.1 – Rational Method Hydrologic Analysis
(AES 2010)

```
_____
****************************************************************************

                RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
                Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                            2003,1985,1981 HYDROLOGY MANUAL
                (c) Copyright 1982-2003 Advanced Engineering Software (aes)
                    Ver. 1.5A Release Date: 01/01/2003  License ID 1239

                            Analysis prepared by:

                        HUNSAKER & ASSOCIATES - SAN DIEGO
                            10179 Huennekens Street
                            San Diego, Ca. 92121
                                (858) 558-4500

 ************************* DESCRIPTION OF STUDY *************************
 * Village 13 Existing Condition Hydrology Model                        *
 *                                                                      *
 *                                                                      *
 ************************************************************************

   FILE NAME: R:\0982\HYD\AES\EX-100.DAT
   TIME/DATE OF STUDY: 11:11 12/15/2010
---------------------------------------------------------------------------
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
---------------------------------------------------------------------------
   2003 SAN DIEGO MANUAL CRITERIA

   USER SPECIFIED STORM EVENT(YEAR) = 100.00
   6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
   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<<<<<
===========================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =    645.00
   DOWNSTREAM ELEVATION(FEET) =    640.00
   ELEVATION DIFFERENCE(FEET) =      5.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.895
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.887
   SUBAREA RUNOFF(CFS) =      0.52
   TOTAL AREA(ACRES) =       0.25   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
   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) =    640.00  DOWNSTREAM(FEET) =    530.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1590.00   CHANNEL SLOPE = 0.0692
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.455
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    22.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.21
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   4.27
  Tc(MIN.) =  12.16
  SUBAREA AREA(ACRES) =     27.87        SUBAREA RUNOFF(CFS) =    43.46
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      28.12         PEAK FLOW RATE(CFS) =       43.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.81   FLOW VELOCITY(FEET/SEC.) =   7.46
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 = 1690.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    103.00 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) =   530.00  DOWNSTREAM(FEET) =   520.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.97
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     43.85
  PIPE TRAVEL TIME(MIN.) =   0.07   Tc(MIN.) =  12.24
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    104.00 = 1790.00 FEET.

+-----------------------------------------------------------------------------+
| Discharge at Culvert 1A.                                                    |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    630.00
  DOWNSTREAM ELEVATION(FEET) =    625.00
  ELEVATION DIFFERENCE(FEET) =     5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.887
  SUBAREA RUNOFF(CFS) =     0.21
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.21

*******************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    620.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.00   CHANNEL SLOPE = 0.1406
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.839
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     5.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.80
```

```
   AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   2.80
   Tc(MIN.) =  10.70
   SUBAREA AREA(ACRES) =       6.44       SUBAREA RUNOFF(CFS) =   10.91
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =       6.54       PEAK FLOW RATE(CFS) =      11.08

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.19   FLOW VELOCITY(FEET/SEC.) =   4.79
   LONGEST FLOWPATH FROM NODE    151.00 TO NODE    153.00 =   740.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   153.00 TO NODE    154.00 IS CODE =  31
-------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   535.00 DOWNSTREAM(FEET) =   515.00
   FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
   ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
   DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.0 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  21.34
   ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     11.08
   PIPE TRAVEL TIME(MIN.) =   0.08   Tc(MIN.) =  10.78
   LONGEST FLOWPATH FROM NODE    151.00 TO NODE    154.00 =   840.00 FEET.


+-----------------------------------------------------------------------------+
| Discharge at Culvert 1B.                                                    |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+


*******************************************************************************
   FLOW PROCESS FROM NODE   201.00 TO NODE    202.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =    644.00
   DOWNSTREAM ELEVATION(FEET) =    640.00
   ELEVATION DIFFERENCE(FEET) =     4.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.505
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.611
   SUBAREA RUNOFF(CFS) =      0.20
   TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.20

*******************************************************************************
   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) =    640.00 DOWNSTREAM(FEET) =    500.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1595.00   CHANNEL SLOPE =  0.0878
   CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.419
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     25.27
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.97
   AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   3.81
   Tc(MIN.) =  12.32
   SUBAREA AREA(ACRES) =    32.01       SUBAREA RUNOFF(CFS) =   49.51
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      32.11       PEAK FLOW RATE(CFS) =      49.66

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.81   FLOW VELOCITY(FEET/SEC.) =   8.44
```

```
   LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 = 1695.00 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) =   500.00  DOWNSTREAM(FEET) =    485.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 27.81
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    49.66
  PIPE TRAVEL TIME(MIN.) =  0.06   Tc(MIN.) = 12.38
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    204.00 = 1795.00 FEET.


+--------------------------------------------------------------------------+
| Discharge at Culvert 2.                                                  |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
   FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    915.00
  DOWNSTREAM ELEVATION(FEET) =   900.00
  ELEVATION DIFFERENCE(FEET) =    15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =       0.09   TOTAL RUNOFF(CFS) =      0.22


****************************************************************************
   FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    900.00  DOWNSTREAM(FEET) =    708.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   685.00   CHANNEL SLOPE =  0.2803
  CHANNEL BASE(FEET) =    4.00    "Z" FACTOR =    2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.068
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    12.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.02
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =  1.27
  Tc(MIN.) =   7.53
  SUBAREA AREA(ACRES) =    11.24        SUBAREA RUNOFF(CFS) =   23.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      11.33         PEAK FLOW RATE(CFS) =     24.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) = 11.28
  LONGEST FLOWPATH FROM NODE    401.00 TO NODE    403.00 =  785.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

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```
ELEVATION DATA: UPSTREAM(FEET) =    708.00  DOWNSTREAM(FEET) =    640.00
CHANNEL LENGTH THRU SUBAREA(FEET) =    638.00   CHANNEL SLOPE = 0.1066
CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =    2.500
MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.491
*USER SPECIFIED(SUBAREA):
ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =    0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     36.16
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.42
AVERAGE FLOW DEPTH(FEET) =    0.58   TRAVEL TIME(MIN.) =   1.26
Tc(MIN.) =    8.80
SUBAREA AREA(ACRES) =    12.58       SUBAREA RUNOFF(CFS) =    24.18
AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
TOTAL AREA(ACRES) =      23.91          PEAK FLOW RATE(CFS) =       45.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   9.09
LONGEST FLOWPATH FROM NODE    401.00 TO NODE    404.00 = 1423.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =    1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.80
  RAINFALL INTENSITY(INCH/HR) =   5.49
  TOTAL STREAM AREA(ACRES) =    23.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.95

******************************************************************************
  FLOW PROCESS FROM NODE    405.00 TO NODE    406.00 IS CODE =   21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1146.00
  DOWNSTREAM ELEVATION(FEET) =   1135.00
  ELEVATION DIFFERENCE(FEET) =      11.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =     0.17
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.17

******************************************************************************
  FLOW PROCESS FROM NODE    406.00 TO NODE    407.00 IS CODE =   51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    900.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    804.00   CHANNEL SLOPE = 0.2923
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =    6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.764
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.09
  AVERAGE FLOW DEPTH(FEET) =    0.25   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =    8.16
  SUBAREA AREA(ACRES) =     6.09       SUBAREA RUNOFF(CFS) =    12.29
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      6.16          PEAK FLOW RATE(CFS) =       12.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
   DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   8.52
   LONGEST FLOWPATH FROM NODE    405.00 TO NODE    407.00 =  904.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   407.00 TO NODE    404.00 IS CODE =  51
---------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    900.00  DOWNSTREAM(FEET) =   640.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1028.00   CHANNEL SLOPE =  0.2529
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.097
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     21.16
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.99
   AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   1.71
   Tc(MIN.) =   9.87
   SUBAREA AREA(ACRES) =      9.77       SUBAREA RUNOFF(CFS) =   17.43
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      15.93       PEAK FLOW RATE(CFS) =     28.42

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) = 10.99
   LONGEST FLOWPATH FROM NODE    405.00 TO NODE    404.00 = 1932.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   404.00 TO NODE    404.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS = 2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =  9.87
   RAINFALL INTENSITY(INCH/HR) =  5.10
   TOTAL STREAM AREA(ACRES) =   15.93
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.42

   ** CONFLUENCE DATA **
   STREAM     RUNOFF     Tc       INTENSITY      AREA
   NUMBER     (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1       45.95     8.80       5.491         23.91
      2       28.42     9.87       5.097         15.93

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF     Tc       INTENSITY
   NUMBER     (CFS)    (MIN.)    (INCH/HOUR)
      1       71.27     8.80       5.491
      2       71.07     9.87       5.097

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      71.27   Tc(MIN.) =    8.80
   TOTAL AREA(ACRES) =      39.84
   LONGEST FLOWPATH FROM NODE    405.00 TO NODE    404.00 = 1932.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   404.00 TO NODE    408.00 IS CODE =  51
----------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    640.00  DOWNSTREAM(FEET) =   610.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  493.00   CHANNEL SLOPE =  0.0609
   CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.148
```

```
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    80.92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.87
 AVERAGE FLOW DEPTH(FEET) =  1.06   TRAVEL TIME(MIN.) =   0.93
 Tc(MIN.) =   9.72
 SUBAREA AREA(ACRES) =    10.71      SUBAREA RUNOFF(CFS) =   19.30
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     50.55        PEAK FLOW RATE(CFS) =      91.07

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   9.19
 LONGEST FLOWPATH FROM NODE    405.00 TO NODE    408.00 =  2425.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    408.00 TO NODE    409.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    610.00 DOWNSTREAM(FEET) =   575.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   663.00   CHANNEL SLOPE = 0.0528
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.752
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   105.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.61
  AVERAGE FLOW DEPTH(FEET) =  1.09   TRAVEL TIME(MIN.) =   1.28
  Tc(MIN.) =  11.00
  SUBAREA AREA(ACRES) =    17.38      SUBAREA RUNOFF(CFS) =   28.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     67.93        PEAK FLOW RATE(CFS) =     112.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   8.76
  LONGEST FLOWPATH FROM NODE    405.00 TO NODE    409.00 =  3088.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    409.00 TO NODE    409.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.00
  RAINFALL INTENSITY(INCH/HR) =   4.75
  TOTAL STREAM AREA(ACRES) =   67.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   112.98

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1162.00
  DOWNSTREAM ELEVATION(FEET) =   1150.00
  ELEVATION DIFFERENCE(FEET) =    12.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =     0.26
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =     0.26

****************************************************************************
  FLOW PROCESS FROM NODE    411.00 TO NODE    412.00 IS CODE =  51
```

```
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1768.00   CHANNEL SLOPE =  0.2545
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.189
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     16.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.83
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   3.34
  Tc(MIN.) =   9.60
  SUBAREA AREA(ACRES) =    17.30       SUBAREA RUNOFF(CFS) =   31.42
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     17.41        PEAK FLOW RATE(CFS) =      31.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =  10.98
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    412.00 =  1868.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   412.00 TO NODE    409.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    575.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1161.00   CHANNEL SLOPE =  0.1077
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.462
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     41.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.65
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =  12.13
  SUBAREA AREA(ACRES) =    12.13       SUBAREA RUNOFF(CFS) =   18.94
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     29.54        PEAK FLOW RATE(CFS) =      46.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =  7.87
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    409.00 =  3029.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   409.00 TO NODE    409.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.13
  RAINFALL INTENSITY(INCH/HR) =   4.46
  TOTAL STREAM AREA(ACRES) =    29.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     46.13

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc      INTENSITY       AREA
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)     (ACRE)
     1      112.98    11.00      4.752          67.93
     2       46.13    12.13      4.462          29.54

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

  ** PEAK FLOW RATE TABLE **
```

```
 STREAM    RUNOFF     Tc     INTENSITY
 NUMBER    (CFS)    (MIN.)  (INCH/HOUR)
    1      154.82   11.00     4.752
    2      152.22   12.13     4.462

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    154.82   Tc(MIN.) =   11.00
 TOTAL AREA(ACRES) =      97.47
 LONGEST FLOWPATH FROM NODE    405.00 TO NODE    409.00 = 3088.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   409.00 TO NODE   413.00 IS CODE = 51
---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    575.00  DOWNSTREAM(FEET) =    538.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.00   CHANNEL SLOPE = 0.0536
  CHANNEL BASE(FEET) =   5.00   "Z" FACTOR =   3.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.452
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    161.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.84
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =  12.17
  SUBAREA AREA(ACRES) =     8.78      SUBAREA RUNOFF(CFS) =   13.68
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     106.25        PEAK FLOW RATE(CFS) =    165.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.58   FLOW VELOCITY(FEET/SEC.) =   9.91
  LONGEST FLOWPATH FROM NODE    405.00 TO NODE    413.00 = 3778.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   413.00 TO NODE   414.00 IS CODE = 51
---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    538.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   555.00   CHANNEL SLOPE = 0.0865
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.196
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    173.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.89
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =  13.35
  SUBAREA AREA(ACRES) =    10.88      SUBAREA RUNOFF(CFS) =   15.98
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     117.13        PEAK FLOW RATE(CFS) =    172.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   FLOW VELOCITY(FEET/SEC.) =   7.90
  LONGEST FLOWPATH FROM NODE    405.00 TO NODE    414.00 = 4333.00 FEET.

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

***************************************************************************
  FLOW PROCESS FROM NODE   501.00 TO NODE   502.00 IS CODE = 21
---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
```

```
*USER SPECIFIED(SUBAREA):
ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =   0
INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
UPSTREAM ELEVATION(FEET) =   944.00
DOWNSTREAM ELEVATION(FEET) =   930.00
ELEVATION DIFFERENCE(FEET) =   14.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
SUBAREA RUNOFF(CFS) =      0.17
TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE   502.00 TO NODE   503.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   930.00  DOWNSTREAM(FEET) =   577.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1671.00  CHANNEL SLOPE = 0.2113
  CHANNEL BASE(FEET) =   2.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.305
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    15.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.25
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   9.28
  SUBAREA AREA(ACRES) =   15.86       SUBAREA RUNOFF(CFS) =   29.45
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     15.93        PEAK FLOW RATE(CFS) =      29.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.67   FLOW VELOCITY(FEET/SEC.) = 11.09
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    503.00 = 1771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   503.00 TO NODE   504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   577.00  DOWNSTREAM(FEET) =   500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   881.00   CHANNEL SLOPE = 0.0874
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.486
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    41.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.33
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =  12.03
  SUBAREA AREA(ACRES) =   14.90       SUBAREA RUNOFF(CFS) =   23.40
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     30.83        PEAK FLOW RATE(CFS) =      48.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   FLOW VELOCITY(FEET/SEC.) =   5.63
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    504.00 = 2652.00 FEET.

  +------------------------------------------------------------------------+
  | End stream at Culvert #5                                               |
  |                                                                        |
  |                                                                        |
  |                                                                        |
  +------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   601.00 TO NODE   602.00 IS CODE =  21
```

```
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1334.00
 DOWNSTREAM ELEVATION(FEET) =   1330.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.505
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.611
 SUBAREA RUNOFF(CFS) =       0.24
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =       0.24

****************************************************************************
  FLOW PROCESS FROM NODE   602.00 TO NODE    603.00 IS CODE = 51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1330.00  DOWNSTREAM(FEET) =    860.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1513.00   CHANNEL SLOPE = 0.3106
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   3.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.635
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    14.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.59
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =  11.44
  SUBAREA AREA(ACRES) =    17.48       SUBAREA RUNOFF(CFS) =   28.36
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     17.60        PEAK FLOW RATE(CFS) =      28.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   FLOW VELOCITY(FEET/SEC.) = 10.81
  LONGEST FLOWPATH FROM NODE    601.00 TO NODE    603.00 = 1613.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   603.00 TO NODE    604.00 IS CODE = 51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    827.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  249.00   CHANNEL SLOPE = 0.1325
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.484
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    34.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.89
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   0.60
  Tc(MIN.) =  12.04
  SUBAREA AREA(ACRES) =     7.39       SUBAREA RUNOFF(CFS) =   11.60
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     24.99        PEAK FLOW RATE(CFS) =      39.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   FLOW VELOCITY(FEET/SEC.) = 7.27
  LONGEST FLOWPATH FROM NODE    601.00 TO NODE    604.00 = 1862.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   604.00 TO NODE    604.00 IS CODE =  1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
      CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
      TIME OF CONCENTRATION(MIN.) = 12.04
      RAINFALL INTENSITY(INCH/HR) =   4.48
      TOTAL STREAM AREA(ACRES) =    24.99
      PEAK FLOW RATE(CFS) AT CONFLUENCE =      39.22

 *******************************************************************************
   FLOW PROCESS FROM NODE   605.00 TO NODE   606.00 IS CODE =  21
 -------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1734.00
   DOWNSTREAM ELEVATION(FEET) =   1720.00
   ELEVATION DIFFERENCE(FEET) =     14.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
   SUBAREA RUNOFF(CFS) =       0.22
   TOTAL AREA(ACRES) =       0.09   TOTAL RUNOFF(CFS) =       0.22

 *******************************************************************************
   FLOW PROCESS FROM NODE   606.00 TO NODE   607.00 IS CODE =  51
 -------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1720.00 DOWNSTREAM(FEET) =   1030.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1858.00   CHANNEL SLOPE = 0.3714
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.477
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    26.56
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.08
   AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   2.56
   Tc(MIN.) =   8.83
   SUBAREA AREA(ACRES) =    27.20      SUBAREA RUNOFF(CFS) =   52.14
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =     27.29       PEAK FLOW RATE(CFS) =      52.31

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.55   FLOW VELOCITY(FEET/SEC.) = 15.04
   LONGEST FLOWPATH FROM NODE   605.00 TO NODE   607.00 = 1958.00 FEET.

 *******************************************************************************
   FLOW PROCESS FROM NODE   607.00 TO NODE   604.00 IS CODE =  51
 -------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1030.00 DOWNSTREAM(FEET) =    827.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   728.00   CHANNEL SLOPE = 0.2788
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.112
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    61.41
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.18
   AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.00
   Tc(MIN.) =   9.83
   SUBAREA AREA(ACRES) =    10.16      SUBAREA RUNOFF(CFS) =   18.18
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =     37.45       PEAK FLOW RATE(CFS) =      67.01

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
   DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =  12.58
   LONGEST FLOWPATH FROM NODE    605.00 TO NODE    604.00 = 2686.00 FEET.


*****************************************************************************
   FLOW PROCESS FROM NODE    604.00 TO NODE    604.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   9.83
   RAINFALL INTENSITY(INCH/HR) =   5.11
   TOTAL STREAM AREA(ACRES) =    37.45
   PEAK FLOW RATE(CFS) AT CONFLUENCE =      67.01

   ** CONFLUENCE DATA **
   STREAM     RUNOFF      Tc      INTENSITY      AREA
   NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       39.22     12.04       4.484        24.99
      2       67.01      9.83       5.112        37.45

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF      Tc      INTENSITY
   NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       99.01      9.83       5.112
      2       97.99     12.04       4.484

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      99.01   Tc(MIN.) =    9.83
   TOTAL AREA(ACRES) =      62.44
   LONGEST FLOWPATH FROM NODE    605.00 TO NODE    604.00 = 2686.00 FEET.

*****************************************************************************
   FLOW PROCESS FROM NODE    604.00 TO NODE    608.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    827.00  DOWNSTREAM(FEET) =    770.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   589.00   CHANNEL SLOPE = 0.0968
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.825
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    114.29
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.64
   AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   0.92
   Tc(MIN.) =  10.75
   SUBAREA AREA(ACRES) =     18.10        SUBAREA RUNOFF(CFS) =    30.56
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =      80.54         PEAK FLOW RATE(CFS) =     136.00

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =  11.26
   LONGEST FLOWPATH FROM NODE    605.00 TO NODE    608.00 = 3275.00 FEET.


*****************************************************************************
   FLOW PROCESS FROM NODE    608.00 TO NODE    609.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    770.00  DOWNSTREAM(FEET) =    687.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   851.00   CHANNEL SLOPE = 0.0975
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.477
```

```
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =    0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    151.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.72
 AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   1.32
 Tc(MIN.) =  12.07
 SUBAREA AREA(ACRES) =    19.53       SUBAREA RUNOFF(CFS) =   30.60
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     100.07         PEAK FLOW RATE(CFS) =    156.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) = 10.86
 LONGEST FLOWPATH FROM NODE   605.00 TO NODE    609.00 = 4126.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   609.00 TO NODE    610.00 IS CODE = 51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    687.00 DOWNSTREAM(FEET) =    598.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1242.00   CHANNEL SLOPE = 0.0717
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.102
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =    0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    171.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.83
 AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   1.75
 Tc(MIN.) =  13.82
 SUBAREA AREA(ACRES) =    20.44       SUBAREA RUNOFF(CFS) =   29.35
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     120.51         PEAK FLOW RATE(CFS) =    173.04

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) = 11.86
 LONGEST FLOWPATH FROM NODE   605.00 TO NODE    610.00 = 5368.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   610.00 TO NODE    611.00 IS CODE = 51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    598.00 DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1210.00   CHANNEL SLOPE = 0.0686
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.766
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =    0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    188.83
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.29
 AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =   1.96
 Tc(MIN.) =  15.78
 SUBAREA AREA(ACRES) =    23.96       SUBAREA RUNOFF(CFS) =   31.58
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     144.47         PEAK FLOW RATE(CFS) =    190.43

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.05   FLOW VELOCITY(FEET/SEC.) = 10.31
 LONGEST FLOWPATH FROM NODE   605.00 TO NODE    611.00 = 6578.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   611.00 TO NODE    612.00 IS CODE = 51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
   ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    495.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    594.00   CHANNEL SLOPE = 0.0337
   CHANNEL BASE(FEET) =    20.00   "Z" FACTOR =    3.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.576
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    197.49
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.50
   AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   1.32
   Tc(MIN.) =  17.10
   SUBAREA AREA(ACRES) =    11.28      SUBAREA RUNOFF(CFS) =   14.12
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =     155.75        PEAK FLOW RATE(CFS) =    194.94

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   7.46
   LONGEST FLOWPATH FROM NODE    605.00 TO NODE    612.00 = 7172.00 FEET.

+----------------------------------------------------------------------------+
| End stream at Culvert #6                                                   |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    702.00 IS CODE =   21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    1340.00
  DOWNSTREAM ELEVATION(FEET) =   1318.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =      0.12

******************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    703.00 IS CODE =   51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1318.00  DOWNSTREAM(FEET) =    600.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 2916.00   CHANNEL SLOPE = 0.2462
  CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =    3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.712
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    23.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.95
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   4.88
  Tc(MIN.) =  11.15
  SUBAREA AREA(ACRES) =    27.75      SUBAREA RUNOFF(CFS) =   45.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      27.80        PEAK FLOW RATE(CFS) =     45.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =  12.21
  LONGEST FLOWPATH FROM NODE    701.00 TO NODE    703.00 = 3016.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    703.00 TO NODE    703.00 IS CODE =    1
------------------------------------------------------------------------------
```

```
      >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =  11.15
   RAINFALL INTENSITY(INCH/HR) =   4.71
   TOTAL STREAM AREA(ACRES) =    27.80
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.84

*******************************************************************************
   FLOW PROCESS FROM NODE   704.00 TO NODE    705.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =  1192.00
   DOWNSTREAM ELEVATION(FEET) =  1162.00
   ELEVATION DIFFERENCE(FEET) =    30.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
   SUBAREA RUNOFF(CFS) =      0.14
   TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.14

*******************************************************************************
   FLOW PROCESS FROM NODE   705.00 TO NODE    703.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =  1162.00  DOWNSTREAM(FEET) =    600.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 2535.00   CHANNEL SLOPE =  0.2217
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.577
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    13.07
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.83
   AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   5.40
   Tc(MIN.) =  11.66
   SUBAREA AREA(ACRES) =    15.55       SUBAREA RUNOFF(CFS) =   24.91
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =     15.61        PEAK FLOW RATE(CFS) =      25.01

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =  9.65
   LONGEST FLOWPATH FROM NODE    704.00 TO NODE    703.00 = 2635.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   703.00 TO NODE    703.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =  11.66
   RAINFALL INTENSITY(INCH/HR) =   4.58
   TOTAL STREAM AREA(ACRES) =    15.61
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.01

   ** CONFLUENCE DATA **
   STREAM     RUNOFF     Tc      INTENSITY     AREA
   NUMBER     (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       45.84    11.15       4.712       27.80
      2       25.01    11.66       4.577       15.61

   RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
   CONFLUENCE FORMULA USED FOR  2 STREAMS.

   ** PEAK FLOW RATE TABLE **
   STREAM    RUNOFF     Tc      INTENSITY
   NUMBER    (CFS)    (MIN.)   (INCH/HOUR)
      1      69.75    11.15      4.712
      2      69.54    11.66      4.577

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     69.75  Tc(MIN.) =   11.15
   TOTAL AREA(ACRES) =     43.41
   LONGEST FLOWPATH FROM NODE    701.00 TO NODE    703.00 = 3016.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    703.00 TO NODE    706.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    600.00  DOWNSTREAM(FEET) =    562.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   592.00   CHANNEL SLOPE = 0.0642
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.437
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   76.21
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.07
   AVERAGE FLOW DEPTH(FEET) =  1.09   TRAVEL TIME(MIN.) =   1.09
   Tc(MIN.) =  12.24
   SUBAREA AREA(ACRES) =      8.32       SUBAREA RUNOFF(CFS) =   12.92
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =     51.73        PEAK FLOW RATE(CFS) =     80.34

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   9.21
   LONGEST FLOWPATH FROM NODE    701.00 TO NODE    706.00 = 3608.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    706.00 TO NODE    706.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  3
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =  12.24
   RAINFALL INTENSITY(INCH/HR) =  4.44
   TOTAL STREAM AREA(ACRES) =   51.73
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    80.34

****************************************************************************
   FLOW PROCESS FROM NODE    707.00 TO NODE    708.00 IS CODE =  21
----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1576.00
   DOWNSTREAM ELEVATION(FEET) =   1543.00
   ELEVATION DIFFERENCE(FEET) =     33.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
   SUBAREA RUNOFF(CFS) =     0.24
   TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
   FLOW PROCESS FROM NODE    708.00 TO NODE    709.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
      >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1543.00  DOWNSTREAM(FEET) =   1010.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1462.00   CHANNEL SLOPE =  0.3646
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.558
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    17.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.31
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   8.63
  SUBAREA AREA(ACRES) =    17.48      SUBAREA RUNOFF(CFS) =   34.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    17.58       PEAK FLOW RATE(CFS) =      34.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) = 13.02
  LONGEST FLOWPATH FROM NODE   707.00 TO NODE   709.00 = 1562.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   709.00 TO NODE   710.00 IS CODE = 51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1010.00  DOWNSTREAM(FEET) =    749.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1003.00   CHANNEL SLOPE =  0.2602
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.100
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    51.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.55
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   1.23
  Tc(MIN.) =   9.86
  SUBAREA AREA(ACRES) =    19.65      SUBAREA RUNOFF(CFS) =   35.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    37.23       PEAK FLOW RATE(CFS) =      66.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) = 14.66
  LONGEST FLOWPATH FROM NODE   707.00 TO NODE   710.00 = 2565.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   710.00 TO NODE   706.00 IS CODE = 51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    749.00  DOWNSTREAM(FEET) =    562.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 2085.00   CHANNEL SLOPE =  0.0897
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.229
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    82.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.46
  AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) = 13.19
  SUBAREA AREA(ACRES) =    22.19      SUBAREA RUNOFF(CFS) =   32.84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    59.42       PEAK FLOW RATE(CFS) =      87.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) = 10.67
  LONGEST FLOWPATH FROM NODE   707.00 TO NODE   706.00 = 4650.00 FEET.
```

```
 *****************************************************************************
   FLOW PROCESS FROM NODE    706.00 TO NODE    706.00 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.) =  13.19
   RAINFALL INTENSITY(INCH/HR) =   4.23
   TOTAL STREAM AREA(ACRES) =    59.42
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     87.94

 *****************************************************************************
   FLOW PROCESS FROM NODE    711.00 TO NODE    712.00 IS CODE =   21
 -----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 =============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1870.00
   DOWNSTREAM ELEVATION(FEET) =   1850.00
   ELEVATION DIFFERENCE(FEET) =     20.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
   SUBAREA RUNOFF(CFS) =       0.41
   TOTAL AREA(ACRES) =       0.17   TOTAL RUNOFF(CFS) =       0.41

 *****************************************************************************
   FLOW PROCESS FROM NODE    712.00 TO NODE    713.00 IS CODE =   51
 -----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 =============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1850.00 DOWNSTREAM(FEET) =   1400.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   896.00   CHANNEL SLOPE = 0.5022
   CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.077
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     18.13
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.96
   AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.25
   Tc(MIN.) =   7.52
   SUBAREA AREA(ACRES) =    16.59       SUBAREA RUNOFF(CFS) =   35.29
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =     16.76       PEAK FLOW RATE(CFS) =     35.65

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.45   FLOW VELOCITY(FEET/SEC.) = 14.92
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    713.00 =  996.00 FEET.

 *****************************************************************************
   FLOW PROCESS FROM NODE    713.00 TO NODE    714.00 IS CODE =   51
 -----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 =============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1400.00 DOWNSTREAM(FEET) =   1200.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   652.00   CHANNEL SLOPE = 0.3067
   CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.692
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     45.29
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.52
```

```
   AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   0.80
   Tc(MIN.) =   8.32
   SUBAREA AREA(ACRES) =      9.67      SUBAREA RUNOFF(CFS) =   19.26
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      26.43      PEAK FLOW RATE(CFS) =      52.65

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.63   FLOW VELOCITY(FEET/SEC.) =  14.18
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    714.00 = 1648.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    714.00 TO NODE    715.00 IS CODE = 51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1200.00 DOWNSTREAM(FEET) =   1080.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   504.00   CHANNEL SLOPE =  0.2381
   CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.449
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     77.35
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.44
   AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   0.58
   Tc(MIN.) =   8.90
   SUBAREA AREA(ACRES) =     25.90      SUBAREA RUNOFF(CFS) =   49.39
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      52.33      PEAK FLOW RATE(CFS) =      99.80

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.94   FLOW VELOCITY(FEET/SEC.) =  15.49
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    715.00 = 2152.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    715.00 TO NODE    716.00 IS CODE = 51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1080.00 DOWNSTREAM(FEET) =   1000.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   369.00   CHANNEL SLOPE =  0.2168
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.278
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    125.70
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.69
   AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   0.45
   Tc(MIN.) =   9.35
   SUBAREA AREA(ACRES) =     28.04      SUBAREA RUNOFF(CFS) =   51.80
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      80.37      PEAK FLOW RATE(CFS) =     148.48

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.78   FLOW VELOCITY(FEET/SEC.) =  14.44
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    716.00 = 2521.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    716.00 TO NODE    717.00 IS CODE = 51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1000.00 DOWNSTREAM(FEET) =    860.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1158.00   CHANNEL SLOPE =  0.1209
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.775
```

```
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   167.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.28
 AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   1.57
 Tc(MIN.) = 10.92
 SUBAREA AREA(ACRES) =    23.07      SUBAREA RUNOFF(CFS) =   38.56
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =    103.44      PEAK FLOW RATE(CFS) =    172.87

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.00   FLOW VELOCITY(FEET/SEC.) = 12.40
 LONGEST FLOWPATH FROM NODE   711.00 TO NODE   717.00 = 3679.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   717.00 TO NODE   718.00 IS CODE = 51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   860.00 DOWNSTREAM(FEET) =   830.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   498.00   CHANNEL SLOPE = 0.0602
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.554
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   191.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.99
 AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   0.83
 Tc(MIN.) = 11.75
 SUBAREA AREA(ACRES) =    23.43      SUBAREA RUNOFF(CFS) =   37.35
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =    126.87      PEAK FLOW RATE(CFS) =    202.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.31   FLOW VELOCITY(FEET/SEC.) = 10.14
 LONGEST FLOWPATH FROM NODE   711.00 TO NODE   718.00 = 4177.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   718.00 TO NODE   719.00 IS CODE = 51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   830.00 DOWNSTREAM(FEET) =   807.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE = 0.0821
 CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   4.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.453
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   234.61
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.16
 AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   0.42
 Tc(MIN.) = 12.17
 SUBAREA AREA(ACRES) =    41.54      SUBAREA RUNOFF(CFS) =   64.74
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =    168.41      PEAK FLOW RATE(CFS) =    262.47

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.16   FLOW VELOCITY(FEET/SEC.) = 11.56
 LONGEST FLOWPATH FROM NODE   711.00 TO NODE   719.00 = 4457.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   719.00 TO NODE   720.00 IS CODE = 51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
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```
   ELEVATION DATA: UPSTREAM(FEET) =    807.00  DOWNSTREAM(FEET) =    735.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    977.00   CHANNEL SLOPE = 0.0737
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.144
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    278.85
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.35
   AVERAGE FLOW DEPTH(FEET) =   1.23   TRAVEL TIME(MIN.) =   1.44
   Tc(MIN.) = 13.61
   SUBAREA AREA(ACRES) =    22.59       SUBAREA RUNOFF(CFS) =    32.76
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =    191.00         PEAK FLOW RATE(CFS) =    277.02

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.23   FLOW VELOCITY(FEET/SEC.) = 11.29
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    720.00 = 5434.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    720.00 TO NODE    721.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    705.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    491.00   CHANNEL SLOPE = 0.0611
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.007
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    295.47
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.22
   AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   0.73
   Tc(MIN.) = 14.34
   SUBAREA AREA(ACRES) =    26.30       SUBAREA RUNOFF(CFS) =    36.88
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =    217.30         PEAK FLOW RATE(CFS) =    304.74

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.40   FLOW VELOCITY(FEET/SEC.) = 11.35
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    721.00 = 5925.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    721.00 TO NODE    722.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    705.00  DOWNSTREAM(FEET) =    630.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   1087.00   CHANNEL SLOPE = 0.0690
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.775
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    316.11
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.06
   AVERAGE FLOW DEPTH(FEET) =   1.70   TRAVEL TIME(MIN.) =   1.39
   Tc(MIN.) = 15.72
   SUBAREA AREA(ACRES) =    17.22       SUBAREA RUNOFF(CFS) =    22.75
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =    234.52         PEAK FLOW RATE(CFS) =    309.87

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.68   FLOW VELOCITY(FEET/SEC.) = 12.98
   LONGEST FLOWPATH FROM NODE    711.00 TO NODE    722.00 = 7012.00 FEET.

****************************************************************************
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```
   FLOW PROCESS FROM NODE    722.00 TO NODE    706.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    562.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1491.00   CHANNEL SLOPE =  0.0456
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.422
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    325.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.61
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =  18.31
  SUBAREA AREA(ACRES) =    26.75       SUBAREA RUNOFF(CFS) =   32.04
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    261.27       PEAK FLOW RATE(CFS) =    312.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   9.49
  LONGEST FLOWPATH FROM NODE    711.00 TO NODE    706.00 = 8503.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    706.00 TO NODE    706.00 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.) =  18.31
  RAINFALL INTENSITY(INCH/HR) =   3.42
  TOTAL STREAM AREA(ACRES) =   261.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    312.92

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       80.34     12.24       4.437        51.73
     2       87.94     13.19       4.229        59.42
     3      312.92     18.31       3.422       261.27

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      371.12     12.24       4.437
     2      389.88     13.19       4.229
     3      446.04     18.31       3.422

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    446.04   Tc(MIN.) =   18.31
  TOTAL AREA(ACRES) =    372.42
  LONGEST FLOWPATH FROM NODE    711.00 TO NODE    706.00 = 8503.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    706.00 TO NODE    723.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    562.00  DOWNSTREAM(FEET) =    545.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   523.00   CHANNEL SLOPE =  0.0325
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.323
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
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```
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   459.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.22
 AVERAGE FLOW DEPTH(FEET) =  2.33   TRAVEL TIME(MIN.) =   0.85
 Tc(MIN.) = 19.16
 SUBAREA AREA(ACRES) =   24.00      SUBAREA RUNOFF(CFS) =   27.91
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =    396.42      PEAK FLOW RATE(CFS) =    461.04

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.33   FLOW VELOCITY(FEET/SEC.) = 10.23
 LONGEST FLOWPATH FROM NODE    711.00 TO NODE    723.00 = 9026.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    723.00 TO NODE    724.00 IS CODE =  51
 --------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    545.00 DOWNSTREAM(FEET) =    515.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =    986.00   CHANNEL SLOPE =  0.0304
 CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   5.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.100
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   480.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.55
 AVERAGE FLOW DEPTH(FEET) =  1.14   TRAVEL TIME(MIN.) =   2.18
 Tc(MIN.) = 21.34
 SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =   38.51
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =    431.91      PEAK FLOW RATE(CFS) =    468.65

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   7.49
 LONGEST FLOWPATH FROM NODE    711.00 TO NODE    724.00 = 10012.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    724.00 TO NODE    725.00 IS CODE =  51
 --------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    515.00 DOWNSTREAM(FEET) =    505.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =    563.00   CHANNEL SLOPE =  0.0178
 CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   5.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.970
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   484.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.37
 AVERAGE FLOW DEPTH(FEET) =  1.34   TRAVEL TIME(MIN.) =   1.47
 Tc(MIN.) = 22.81
 SUBAREA AREA(ACRES) =   29.79      SUBAREA RUNOFF(CFS) =   30.96
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =    461.70      PEAK FLOW RATE(CFS) =    479.87

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   6.36
 LONGEST FLOWPATH FROM NODE    711.00 TO NODE    725.00 = 10575.00 FEET.

 +------------------------------------------------------------------------+
 | End stream at Culvert #7.                                              |
 |                                                                        |
 |                                                                        |
 |                                                                        |
 +------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  21
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--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   645.00
 DOWNSTREAM ELEVATION(FEET) =   642.00
 ELEVATION DIFFERENCE(FEET) =     3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.361
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.275
 SUBAREA RUNOFF(CFS) =      0.11
 TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.11


******************************************************************************
  FLOW PROCESS FROM NODE   802.00 TO NODE   803.00 IS CODE = 51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    642.00  DOWNSTREAM(FEET) =    548.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   912.00    CHANNEL SLOPE = 0.1031
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   6.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.273
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     5.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.21
 AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   3.61
 Tc(MIN.) = 12.98
 SUBAREA AREA(ACRES) =      7.11        SUBAREA RUNOFF(CFS) =   10.63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =      7.17          PEAK FLOW RATE(CFS) =      10.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   FLOW VELOCITY(FEET/SEC.) =   5.21
  LONGEST FLOWPATH FROM NODE   801.00 TO NODE   803.00 = 1012.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   803.00 TO NODE   804.00 IS CODE = 51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    548.00  DOWNSTREAM(FEET) =    515.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =    97.00    CHANNEL SLOPE = 0.3402
 CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =    8.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.215
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    22.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.84
 AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   0.28
 Tc(MIN.) = 13.25
 SUBAREA AREA(ACRES) =     16.12        SUBAREA RUNOFF(CFS) =   23.78
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =      23.29          PEAK FLOW RATE(CFS) =      34.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.16   FLOW VELOCITY(FEET/SEC.) =   6.99
  LONGEST FLOWPATH FROM NODE   801.00 TO NODE   804.00 = 1109.00 FEET.


  +------------------------------------------------------------------------+
  | End stream at Culvert #8                                               |
  |                                                                        |
  |                                                                        |
  +------------------------------------------------------------------------+
```

```
********************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =   21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    650.00
  DOWNSTREAM ELEVATION(FEET) =    645.00
  ELEVATION DIFFERENCE(FEET) =     5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.887
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =       0.12


********************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    903.00 IS CODE =   51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    645.00  DOWNSTREAM(FEET) =    520.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1387.00   CHANNEL SLOPE = 0.0901
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   7.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.104
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.91
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   5.92
  Tc(MIN.) =  13.81
  SUBAREA AREA(ACRES) =    19.80       SUBAREA RUNOFF(CFS) =   28.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     19.86       PEAK FLOW RATE(CFS) =     28.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   4.94
  LONGEST FLOWPATH FROM NODE    901.00 TO NODE    903.00 = 1487.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    903.00 IS CODE =    1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.81
  RAINFALL INTENSITY(INCH/HR) =   4.10
  TOTAL STREAM AREA(ACRES) =   19.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    28.53


********************************************************************************
  FLOW PROCESS FROM NODE    904.00 TO NODE    905.00 IS CODE =   21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    680.00
  DOWNSTREAM ELEVATION(FEET) =    665.00
  ELEVATION DIFFERENCE(FEET) =    15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =       0.31
```

```
  ***************************************************************************
    FLOW PROCESS FROM NODE    905.00 TO NODE    906.00 IS CODE =  51
  ---------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
  ===========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    657.00  DOWNSTREAM(FEET) =    580.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1431.00   CHANNEL SLOPE = 0.0538
    CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   7.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.317
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    19.68
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.67
    AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   6.50
    Tc(MIN.) = 12.77
    SUBAREA AREA(ACRES) =    24.51      SUBAREA RUNOFF(CFS) =   37.03
    AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
    TOTAL AREA(ACRES) =     24.64      PEAK FLOW RATE(CFS) =      37.23

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) = 0.36   FLOW VELOCITY(FEET/SEC.) =  4.65
    LONGEST FLOWPATH FROM NODE   904.00 TO NODE   906.00 = 1531.00 FEET.

  ***************************************************************************
    FLOW PROCESS FROM NODE    906.00 TO NODE    907.00 IS CODE =  51
  ---------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
  ===========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    580.00  DOWNSTREAM(FEET) =    544.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =  586.00   CHANNEL SLOPE = 0.0614
    CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   4.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.979
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    54.14
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.69
    AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   1.72
    Tc(MIN.) = 14.49
    SUBAREA AREA(ACRES) =    24.24      SUBAREA RUNOFF(CFS) =   33.76
    AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
    TOTAL AREA(ACRES) =     48.88      PEAK FLOW RATE(CFS) =      68.08

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) = 0.50   FLOW VELOCITY(FEET/SEC.) =  6.21
    LONGEST FLOWPATH FROM NODE   904.00 TO NODE   907.00 = 2117.00 FEET.

  ***************************************************************************
    FLOW PROCESS FROM NODE    907.00 TO NODE    903.00 IS CODE =  51
  ---------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
  ===========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    544.00  DOWNSTREAM(FEET) =    520.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =  538.00   CHANNEL SLOPE = 0.0446
    CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   4.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.724
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    72.10
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.71
    AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   1.57
    Tc(MIN.) = 16.06
    SUBAREA AREA(ACRES) =     6.17      SUBAREA RUNOFF(CFS) =    8.04
    AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
    TOTAL AREA(ACRES) =     55.05      PEAK FLOW RATE(CFS) =      71.75
```

```
   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   5.74
   LONGEST FLOWPATH FROM NODE    904.00 TO NODE    903.00 = 2655.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    903.00 TO NODE    903.00 IS CODE =    1
--------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =  16.06
   RAINFALL INTENSITY(INCH/HR) =   3.72
   TOTAL STREAM AREA(ACRES) =    55.05
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     71.75

   ** CONFLUENCE DATA **
   STREAM     RUNOFF     Tc      INTENSITY      AREA
   NUMBER     (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
       1      28.53    13.81       4.104        19.86
       2      71.75    16.06       3.724        55.05

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF     Tc      INTENSITY
   NUMBER     (CFS)    (MIN.)   (INCH/HOUR)
       1      90.22    13.81       4.104
       2      97.63    16.06       3.724

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      97.63   Tc(MIN.) =   16.06
   TOTAL AREA(ACRES) =      74.91
   LONGEST FLOWPATH FROM NODE    904.00 TO NODE    903.00 = 2655.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    903.00 TO NODE    908.00 IS CODE =  51
--------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    520.00 DOWNSTREAM(FEET) =    505.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    739.00   CHANNEL SLOPE = 0.0203
   CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   7.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.381
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    105.71
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.74
   AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   2.60
   Tc(MIN.) =  18.66
   SUBAREA AREA(ACRES) =     13.65        SUBAREA RUNOFF(CFS) =   16.15
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =      88.56          PEAK FLOW RATE(CFS) =     104.78

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   4.74
   LONGEST FLOWPATH FROM NODE    904.00 TO NODE    908.00 = 3394.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    908.00 TO NODE    909.00 IS CODE =  51
--------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    505.00 DOWNSTREAM(FEET) =    500.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    211.00   CHANNEL SLOPE = 0.0237
   CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   7.000
```

```
MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.303
*USER SPECIFIED(SUBAREA):
ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   114.54
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
AVERAGE FLOW DEPTH(FEET) =  0.86   TRAVEL TIME(MIN.) =   0.69
Tc(MIN.) =  19.34
SUBAREA AREA(ACRES) =    16.89      SUBAREA RUNOFF(CFS) =   19.52
AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
TOTAL AREA(ACRES) =    105.45      PEAK FLOW RATE(CFS) =    121.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   5.22
LONGEST FLOWPATH FROM NODE   904.00 TO NODE   909.00 = 3605.00 FEET.

+---------------------------------------------------------------------------+
| End stream at Culvert #9.                                                 |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE   1002.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    645.00
 DOWNSTREAM ELEVATION(FEET) =    643.00
 ELEVATION DIFFERENCE(FEET) =     2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.960
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.856
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =      0.12

*******************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1003.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    643.00  DOWNSTREAM(FEET) =    530.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1282.00   CHANNEL SLOPE =  0.0881
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   6.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.403
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.83
 AVERAGE FLOW DEPTH(FEET) =  0.29   TRAVEL TIME(MIN.) =   4.42
 Tc(MIN.) =  12.38
 SUBAREA AREA(ACRES) =    12.12      SUBAREA RUNOFF(CFS) =   18.68
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =    12.18      PEAK FLOW RATE(CFS) =    18.77

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   5.86
 LONGEST FLOWPATH FROM NODE   1001.00 TO NODE   1003.00 = 1352.00 FEET.

+---------------------------------------------------------------------------+
| End stream at Culvert #10.                                                |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

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

```
    FLOW PROCESS FROM NODE   1101.00 TO NODE   1102.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   70.00
  UPSTREAM ELEVATION(FEET) =   645.00
  DOWNSTREAM ELEVATION(FEET) =   643.50
  ELEVATION DIFFERENCE(FEET) =     1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   8.761
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.505
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.15

*******************************************************************************
    FLOW PROCESS FROM NODE   1102.00 TO NODE   1103.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   643.50 DOWNSTREAM(FEET) =   515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   978.00   CHANNEL SLOPE = 0.1314
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.430
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     5.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.65
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =  12.27
  SUBAREA AREA(ACRES) =      6.95       SUBAREA RUNOFF(CFS) =   10.78
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =      7.03          PEAK FLOW RATE(CFS) =      10.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   5.70
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE   1103.00 = 1048.00 FEET.

+-----------------------------------------------------------------------------+
| End stream at Culvert #11.                                                  |
|                                                                             |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+

*******************************************************************************
    FLOW PROCESS FROM NODE   1201.00 TO NODE   1202.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   70.00
  UPSTREAM ELEVATION(FEET) =   656.00
  DOWNSTREAM ELEVATION(FEET) =   654.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.960
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.856
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.14

*******************************************************************************
    FLOW PROCESS FROM NODE   1202.00 TO NODE   1203.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   654.00 DOWNSTREAM(FEET) =   515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1437.00   CHANNEL SLOPE = 0.0967
```

```
CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =   6.000
MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.362
*USER SPECIFIED(SUBAREA):
ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    11.31
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.20
AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   4.61
Tc(MIN.) =  12.57
SUBAREA AREA(ACRES) =    14.39       SUBAREA RUNOFF(CFS) =   21.97
AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
TOTAL AREA(ACRES) =     14.46        PEAK FLOW RATE(CFS) =      22.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   6.31
LONGEST FLOWPATH FROM NODE   1201.00 TO NODE   1203.00 = 1507.00 FEET.


+----------------------------------------------------------------------------+
| End stream at Culvert #12.                                                  |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+


******************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE   1302.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    656.00
  DOWNSTREAM ELEVATION(FEET) =    654.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.960
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.856
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.14

******************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    654.00  DOWNSTREAM(FEET) =    510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1222.00   CHANNEL SLOPE =  0.1178
  CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.468
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     7.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =  12.11
  SUBAREA AREA(ACRES) =     9.43       SUBAREA RUNOFF(CFS) =   14.75
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      9.50        PEAK FLOW RATE(CFS) =      14.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE   1301.00 TO NODE   1303.00 = 1292.00 FEET.


+----------------------------------------------------------------------------+
| End stream at Culvert #13.                                                  |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

```
*****************************************************************************
  FLOW PROCESS FROM NODE   1401.00 TO NODE   1402.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    656.00
 DOWNSTREAM ELEVATION(FEET) =    654.00
 ELEVATION DIFFERENCE(FEET) =     2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.960
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.856
 SUBAREA RUNOFF(CFS) =     0.14
 TOTAL AREA(ACRES) =       0.07   TOTAL RUNOFF(CFS) =       0.14

*****************************************************************************
  FLOW PROCESS FROM NODE   1402.00 TO NODE   1403.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    654.00  DOWNSTREAM(FEET) =    505.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1180.00   CHANNEL SLOPE = 0.1263
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.621
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  5.57
  AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   3.53
  Tc(MIN.) =  11.49
  SUBAREA AREA(ACRES) =     12.52       SUBAREA RUNOFF(CFS) =   20.25
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      12.59        PEAK FLOW RATE(CFS) =      20.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1403.00 = 1250.00 FEET.

 +---------------------------------------------------------------------------+
 | End stream at Culvert #14.                                                |
 |                                                                           |
 |                                                                           |
 +---------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE   1501.00 TO NODE   1502.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1600.00
 DOWNSTREAM ELEVATION(FEET) =   1570.00
 ELEVATION DIFFERENCE(FEET) =    30.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
 SUBAREA RUNOFF(CFS) =     0.12
 TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =       0.12

*****************************************************************************
  FLOW PROCESS FROM NODE   1502.00 TO NODE   1503.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
```

```
    ELEVATION DATA: UPSTREAM(FEET) =   1570.00  DOWNSTREAM(FEET) =    940.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1525.00   CHANNEL SLOPE =  0.4131
    CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.182
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.68
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
    AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   3.36
    Tc(MIN.) =   9.62
    SUBAREA AREA(ACRES) =    12.46       SUBAREA RUNOFF(CFS) =    22.60
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      12.51         PEAK FLOW RATE(CFS) =       22.69

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   9.69
    LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1503.00 = 1625.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1503.00 TO NODE   1504.00 IS CODE =  51
---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    940.00  DOWNSTREAM(FEET) =    800.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =  807.00   CHANNEL SLOPE =  0.1735
    CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.687
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     43.31
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.31
    AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.62
    Tc(MIN.) =  11.24
    SUBAREA AREA(ACRES) =    25.13       SUBAREA RUNOFF(CFS) =    41.23
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      37.64         PEAK FLOW RATE(CFS) =       61.75

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   9.40
    LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1504.00 = 2432.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1505.00 IS CODE =  51
---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    740.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =  685.00   CHANNEL SLOPE =  0.0876
    CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.343
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     76.89
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.08
    AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   1.41
    Tc(MIN.) =  12.65
    SUBAREA AREA(ACRES) =    19.93       SUBAREA RUNOFF(CFS) =    30.29
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      57.57         PEAK FLOW RATE(CFS) =       87.50

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   8.44
    LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1505.00 = 3117.00 FEET.

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

```
   FLOW PROCESS FROM NODE   1505.00 TO NODE   1506.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    660.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1089.00   CHANNEL SLOPE =  0.0735
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.935
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    112.42
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.68
   AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   2.09
   Tc(MIN.) =  14.74
   SUBAREA AREA(ACRES) =    36.16      SUBAREA RUNOFF(CFS) =   49.80
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      93.73      PEAK FLOW RATE(CFS) =      129.08

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   9.10
   LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1506.00 = 4206.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   1506.00 TO NODE   1507.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    660.00  DOWNSTREAM(FEET) =    590.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1109.00   CHANNEL SLOPE =  0.0631
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.628
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    154.51
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.35
   AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   1.98
   Tc(MIN.) =  16.72
   SUBAREA AREA(ACRES) =    40.03      SUBAREA RUNOFF(CFS) =   50.83
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =     133.76      PEAK FLOW RATE(CFS) =      169.86

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   9.66
   LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1507.00 = 5315.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   1507.00 TO NODE   1508.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    590.00  DOWNSTREAM(FEET) =    545.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1016.00   CHANNEL SLOPE =  0.0443
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.378
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    184.66
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.66
   AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   1.96
   Tc(MIN.) =  18.68
   SUBAREA AREA(ACRES) =    25.04      SUBAREA RUNOFF(CFS) =   29.61
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =     158.80      PEAK FLOW RATE(CFS) =      187.77
```

```
END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.16   FLOW VELOCITY(FEET/SEC.) =   8.72
LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1508.00 =  6331.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1508.00 TO NODE   1509.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    545.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    440.00   CHANNEL SLOPE =  0.0341
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.275
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    211.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.93
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   0.92
  Tc(MIN.) =  19.60
  SUBAREA AREA(ACRES) =    41.55       SUBAREA RUNOFF(CFS) =   47.62
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     200.35        PEAK FLOW RATE(CFS) =     229.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.22   FLOW VELOCITY(FEET/SEC.) =   8.14
  LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1509.00 =  6771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1509.00 TO NODE   1510.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    962.00   CHANNEL SLOPE =  0.0312
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.077
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    243.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.09
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =  21.58
  SUBAREA AREA(ACRES) =    25.26       SUBAREA RUNOFF(CFS) =   27.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     225.61        PEAK FLOW RATE(CFS) =     243.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.29   FLOW VELOCITY(FEET/SEC.) =   8.08
  LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1510.00 =  7733.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1510.00 TO NODE   1511.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    500.00  DOWNSTREAM(FEET) =    495.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    126.00   CHANNEL SLOPE =  0.0397
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.051
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    262.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.35
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   0.29
```

```
  Tc(MIN.) =  21.87
  SUBAREA AREA(ACRES) =    37.19       SUBAREA RUNOFF(CFS) =   39.72
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    262.80        PEAK FLOW RATE(CFS) =    280.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.89   FLOW VELOCITY(FEET/SEC.) =  7.55
  LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1511.00 = 7859.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1511.00 TO NODE   1512.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    495.00 DOWNSTREAM(FEET) =   480.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   739.00   CHANNEL SLOPE = 0.0203
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.887
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   296.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.27
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =  23.83
  SUBAREA AREA(ACRES) =    30.65       SUBAREA RUNOFF(CFS) =   30.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    293.45        PEAK FLOW RATE(CFS) =    296.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.12   FLOW VELOCITY(FEET/SEC.) =  6.27
  LONGEST FLOWPATH FROM NODE   1501.00 TO NODE   1512.00 = 8598.00 FEET.

+-----------------------------------------------------------------------------+
| End stream at Culvert #15.                                                   |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE  16001.00 TO NODE  16002.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   70.00
  UPSTREAM ELEVATION(FEET) =   1643.00
  DOWNSTREAM ELEVATION(FEET) =   1639.00
  ELEVATION DIFFERENCE(FEET) =     4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.318
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.797
  SUBAREA RUNOFF(CFS) =     0.17
  TOTAL AREA(ACRES) =     0.07   TOTAL RUNOFF(CFS) =     0.17

*******************************************************************************
  FLOW PROCESS FROM NODE  16002.00 TO NODE  16003.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    639.00 DOWNSTREAM(FEET) =   502.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1262.00   CHANNEL SLOPE = 0.1086
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.823
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     7.37
```

```
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.74
   AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   4.44
   Tc(MIN.) =  10.76
   SUBAREA AREA(ACRES) =        8.33      SUBAREA RUNOFF(CFS) =   14.06
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =        8.40        PEAK FLOW RATE(CFS) =      14.18

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.35   FLOW VELOCITY(FEET/SEC.) =   5.79
   LONGEST FLOWPATH FROM NODE  16001.00 TO NODE  16003.00 = 1332.00 FEET.


  +---------------------------------------------------------------------------+
  |                                                                           |
  | Discharge at Node 16003 = Culvert 16A                                     |
  |                                                                           |
  +---------------------------------------------------------------------------+


  *****************************************************************************
   FLOW PROCESS FROM NODE   1601.00 TO NODE   1602.00 IS CODE =  21
  ---------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  ===========================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =    803.00
   DOWNSTREAM ELEVATION(FEET) =    800.00
   ELEVATION DIFFERENCE(FEET) =      3.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.361
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.275
   SUBAREA RUNOFF(CFS) =      0.24
   TOTAL AREA(ACRES) =       0.13   TOTAL RUNOFF(CFS) =       0.24

  *****************************************************************************
   FLOW PROCESS FROM NODE   1602.00 TO NODE   1603.00 IS CODE =  51
  ---------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
  ===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    578.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1817.00   CHANNEL SLOPE = 0.1222
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.073
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =    0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    15.38
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.56
   AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   4.62
   Tc(MIN.) =  13.98
   SUBAREA AREA(ACRES) =   20.91      SUBAREA RUNOFF(CFS) =   29.81
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      21.04        PEAK FLOW RATE(CFS) =      29.99

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.52   FLOW VELOCITY(FEET/SEC.) =   8.07
   LONGEST FLOWPATH FROM NODE   1601.00 TO NODE   1603.00 = 1917.00 FEET.

  *****************************************************************************
   FLOW PROCESS FROM NODE   1603.00 TO NODE   1604.00 IS CODE =  51
  ---------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
  ===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    578.00  DOWNSTREAM(FEET) =    527.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   718.00   CHANNEL SLOPE = 0.0710
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.815
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
```

```
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    49.09
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.04
    AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   1.49
    Tc(MIN.) =  15.47
    SUBAREA AREA(ACRES) =      28.59       SUBAREA RUNOFF(CFS) =    38.18
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      49.63         PEAK FLOW RATE(CFS) =       66.27

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   8.78
    LONGEST FLOWPATH FROM NODE  1601.00 TO NODE  1604.00 = 2635.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE  1604.00 TO NODE  1605.00 IS CODE =  51
--------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    495.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =   809.00   CHANNEL SLOPE =  0.0396
    CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   6.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.409
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    82.10
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.57
    AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.95
    Tc(MIN.) =  18.42
    SUBAREA AREA(ACRES) =      26.53       SUBAREA RUNOFF(CFS) =    31.65
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      76.16         PEAK FLOW RATE(CFS) =       90.87

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   4.76
    LONGEST FLOWPATH FROM NODE  1601.00 TO NODE  1605.00 = 3444.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE  1605.00 TO NODE  1606.00 IS CODE =  51
--------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    495.00  DOWNSTREAM(FEET) =    492.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0104
    CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   6.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.240
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    96.58
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.17
    AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   1.51
    Tc(MIN.) =  19.93
    SUBAREA AREA(ACRES) =      10.07       SUBAREA RUNOFF(CFS) =    11.42
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      86.23         PEAK FLOW RATE(CFS) =       97.77

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   3.20
    LONGEST FLOWPATH FROM NODE  1601.00 TO NODE  1606.00 = 3732.00 FEET.

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

****************************************************************************
   FLOW PROCESS FROM NODE  1701.00 TO NODE  1702.00 IS CODE =  21
```

```
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    612.00
 DOWNSTREAM ELEVATION(FEET) =    610.00
 ELEVATION DIFFERENCE(FEET) =     2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.960
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.856
 SUBAREA RUNOFF(CFS) =      0.43
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =       0.43

*******************************************************************************
  FLOW PROCESS FROM NODE   1702.00 TO NODE   1703.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     610.00  DOWNSTREAM(FEET) =    495.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1571.00   CHANNEL SLOPE = 0.0732
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   7.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.242
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    15.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.07
 AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =   5.16
 Tc(MIN.) =  13.12
 SUBAREA AREA(ACRES) =    20.42        SUBAREA RUNOFF(CFS) =   30.32
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =      20.63         PEAK FLOW RATE(CFS) =      30.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   6.10
 LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1703.00 = 1641.00 FEET.

 +---------------------------------------------------------------------------+
 | End stream at Culvert #17.                                                |
 |                                                                           |
 |                                                                           |
 +---------------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE  17001.00 TO NODE  17002.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    590.00
 DOWNSTREAM ELEVATION(FEET) =    586.50
 ELEVATION DIFFERENCE(FEET) =     3.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.606
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.605
 SUBAREA RUNOFF(CFS) =      0.16
 TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.16

*******************************************************************************
  FLOW PROCESS FROM NODE  17002.00 TO NODE  17003.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     586.50  DOWNSTREAM(FEET) =    495.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  805.00   CHANNEL SLOPE = 0.1137
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   6.000
```

```
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.186
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     5.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.46
  AVERAGE FLOW DEPTH(FEET) =  0.20   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   9.61
  SUBAREA AREA(ACRES) =     5.97       SUBAREA RUNOFF(CFS) =  10.84
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =      6.04        PEAK FLOW RATE(CFS) =     10.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29    FLOW VELOCITY(FEET/SEC.) =   5.50
  LONGEST FLOWPATH FROM NODE  17001.00 TO NODE  17003.00 =   875.00 FEET.

  +------------------------------------------------------------------------+
  | Discharge at Node 17003 = Culvert 17A                                  |
  |                                                                        |
  |                                                                        |
  +------------------------------------------------------------------------+

  **************************************************************************
   FLOW PROCESS FROM NODE  18001.00 TO NODE  18002.00 IS CODE =  21
  --------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  ==========================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    597.00
  DOWNSTREAM ELEVATION(FEET) =    595.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.960
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.856
  SUBAREA RUNOFF(CFS) =     0.14
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.14

  **************************************************************************
   FLOW PROCESS FROM NODE  18002.00 TO NODE  18003.00 IS CODE =  51
  --------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
  ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    595.00  DOWNSTREAM(FEET) =    502.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    851.00   CHANNEL SLOPE =  0.1093
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.865
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     8.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.35
  AVERAGE FLOW DEPTH(FEET) =  0.27   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =  10.61
  SUBAREA AREA(ACRES) =     9.61       SUBAREA RUNOFF(CFS) =  16.36
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =      9.68        PEAK FLOW RATE(CFS) =     16.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40    FLOW VELOCITY(FEET/SEC.) =   6.65
  LONGEST FLOWPATH FROM NODE  18001.00 TO NODE  18003.00 =   921.00 FEET.

  +------------------------------------------------------------------------+
  |                                                                        |
  | Discharge at Node 18003 = Culvert 18A                                  |
  |                                                                        |
  +------------------------------------------------------------------------+

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

```
   FLOW PROCESS FROM NODE  1801.00 TO NODE  1802.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =  1665.00
  DOWNSTREAM ELEVATION(FEET) =  1660.00
  ELEVATION DIFFERENCE(FEET) =     5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.887
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =       0.08   TOTAL RUNOFF(CFS) =       0.16

*******************************************************************************
   FLOW PROCESS FROM NODE  1802.00 TO NODE  1803.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1660.00  DOWNSTREAM(FEET) =   1240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1035.00   CHANNEL SLOPE = 0.4058
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.249
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     18.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.23
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =   9.43
  SUBAREA AREA(ACRES) =    19.35      SUBAREA RUNOFF(CFS) =   35.55
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     19.43        PEAK FLOW RATE(CFS) =      35.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   FLOW VELOCITY(FEET/SEC.) = 14.14
  LONGEST FLOWPATH FROM NODE  1801.00 TO NODE  1803.00 = 1135.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE  1803.00 TO NODE  1804.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1240.00  DOWNSTREAM(FEET) =   1180.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE = 0.1592
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.034
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    54.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.95
  AVERAGE FLOW DEPTH(FEET) =    0.50   TRAVEL TIME(MIN.) =   0.63
  Tc(MIN.) =  10.06
  SUBAREA AREA(ACRES) =    21.43      SUBAREA RUNOFF(CFS) =   37.76
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     40.86        PEAK FLOW RATE(CFS) =      71.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   FLOW VELOCITY(FEET/SEC.) = 10.91
  LONGEST FLOWPATH FROM NODE  1801.00 TO NODE  1804.00 = 1512.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE  1804.00 TO NODE  1805.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1180.00  DOWNSTREAM(FEET) =   1140.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   331.00   CHANNEL SLOPE =  0.1208
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.848
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    78.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.12
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   0.60
  Tc(MIN.) =  10.67
  SUBAREA AREA(ACRES) =     8.03       SUBAREA RUNOFF(CFS) =   13.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      48.89        PEAK FLOW RATE(CFS) =      82.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   9.28
  LONGEST FLOWPATH FROM NODE   1801.00 TO NODE   1805.00 = 1843.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1805.00 TO NODE   1806.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   235.00   CHANNEL SLOPE =  0.1702
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.751
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   112.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.55
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   0.34
  Tc(MIN.) =  11.01
  SUBAREA AREA(ACRES) =    35.75       SUBAREA RUNOFF(CFS) =   59.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      84.64        PEAK FLOW RATE(CFS) =     140.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =  12.51
  LONGEST FLOWPATH FROM NODE   1801.00 TO NODE   1806.00 = 2078.00 FEET.


********************************************************************************
  FLOW PROCESS FROM NODE   1806.00 TO NODE   1806.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.01
  RAINFALL INTENSITY(INCH/HR) =   4.75
  TOTAL STREAM AREA(ACRES) =   84.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    140.75

********************************************************************************
  FLOW PROCESS FROM NODE   1807.00 TO NODE   1808.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1710.00
  DOWNSTREAM ELEVATION(FEET) =   1700.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
     SUBAREA RUNOFF(CFS) =      0.14
     TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =       0.14


****************************************************************************
   FLOW PROCESS FROM NODE   1808.00 TO NODE   1809.00 IS CODE =  51
   ------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
   ========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1700.00  DOWNSTREAM(FEET) =   1340.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1285.00   CHANNEL SLOPE =  0.2802
   CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =   2.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.685
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.43
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.36
   AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   2.07
   Tc(MIN.) =   8.33
   SUBAREA AREA(ACRES) =     21.20       SUBAREA RUNOFF(CFS) =   42.19
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =      21.26       PEAK FLOW RATE(CFS) =      42.31

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) = 12.97
   LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1809.00 = 1385.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1809.00 TO NODE   1806.00 IS CODE =  51
   ------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
   ========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1100.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1173.00   CHANNEL SLOPE =  0.2046
   CHANNEL BASE(FEET) =    10.00   "Z" FACTOR =   2.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.043
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.16
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.48
   AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.70
   Tc(MIN.) =  10.04
   SUBAREA AREA(ACRES) =     26.96       SUBAREA RUNOFF(CFS) =   47.59
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =      48.22       PEAK FLOW RATE(CFS) =      85.11

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) = 12.67
   LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1806.00 = 2558.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1806.00 TO NODE   1806.00 IS CODE =   1
   ------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =   5.04
   TOTAL STREAM AREA(ACRES) =    48.22
   PEAK FLOW RATE(CFS) AT CONFLUENCE =      85.11

   ** CONFLUENCE DATA **
   STREAM     RUNOFF      Tc      INTENSITY      AREA
   NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       140.75    11.01       4.751        84.64
```

```
        2        85.11      10.04         5.043          48.22

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF     Tc     INTENSITY
  NUMBER    (CFS)    (MIN.)   (INCH/HOUR)
     1      213.44    10.04      5.043
     2      220.94    11.01      4.751

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    220.94   Tc(MIN.) =   11.01
  TOTAL AREA(ACRES) =    132.86
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1806.00 = 2558.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1806.00 TO NODE   1810.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1060.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   329.00   CHANNEL SLOPE = 0.1216
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.641
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    238.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.47
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   0.41
  Tc(MIN.) =  11.41
  SUBAREA AREA(ACRES) =    22.04       SUBAREA RUNOFF(CFS) =   35.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    154.90        PEAK FLOW RATE(CFS) =    251.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) = 13.71
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1810.00 = 2887.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1810.00 TO NODE   1811.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1060.00  DOWNSTREAM(FEET) =   1030.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE = 0.1071
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.555
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    274.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.82
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   0.34
  Tc(MIN.) =  11.75
  SUBAREA AREA(ACRES) =    29.10       SUBAREA RUNOFF(CFS) =   46.39
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    184.00        PEAK FLOW RATE(CFS) =    293.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) = 14.12
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1811.00 = 3167.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1811.00 TO NODE   1812.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    955.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   722.00   CHANNEL SLOPE =  0.1039
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.355
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    309.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.20
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   0.85
  Tc(MIN.) =  12.60
  SUBAREA AREA(ACRES) =    21.41      SUBAREA RUNOFF(CFS) =   32.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    205.41       PEAK FLOW RATE(CFS) =    313.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) = 14.26
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1812.00 = 3889.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1812.00 TO NODE   1813.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   363.00   CHANNEL SLOPE =  0.0964
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.263
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    337.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.26
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   0.42
  Tc(MIN.) =  13.02
  SUBAREA AREA(ACRES) =    32.46      SUBAREA RUNOFF(CFS) =   48.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    237.87       PEAK FLOW RATE(CFS) =    354.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) = 14.53
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1813.00 = 4252.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1813.00 TO NODE   1814.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    920.00  DOWNSTREAM(FEET) =    870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   522.00   CHANNEL SLOPE =  0.0958
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.142
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    367.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.66
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   0.59
  Tc(MIN.) =  13.62
  SUBAREA AREA(ACRES) =    17.20      SUBAREA RUNOFF(CFS) =   24.93
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    255.07       PEAK FLOW RATE(CFS) =    369.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) = 14.66
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1814.00 = 4774.00 FEET.
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE   1814.00 TO NODE   1815.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   837.00   CHANNEL SLOPE =  0.0836
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.961
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    388.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.25
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =  14.60
  SUBAREA AREA(ACRES) =    27.25      SUBAREA RUNOFF(CFS) =   37.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    282.32        PEAK FLOW RATE(CFS) =    391.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) = 14.32
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1815.00 = 5611.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1815.00 TO NODE   1816.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    735.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1087.00   CHANNEL SLOPE =  0.0598
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.688
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    411.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.63
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =  16.30
  SUBAREA AREA(ACRES) =    31.43      SUBAREA RUNOFF(CFS) =   40.57
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    313.75        PEAK FLOW RATE(CFS) =    405.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) = 10.56
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1816.00 = 6698.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1816.00 TO NODE   1817.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1098.00   CHANNEL SLOPE =  0.0546
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.417
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    425.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.93
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =  18.35
  SUBAREA AREA(ACRES) =    33.67      SUBAREA RUNOFF(CFS) =   40.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    347.42        PEAK FLOW RATE(CFS) =    415.51
```

```
END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.89   FLOW VELOCITY(FEET/SEC.) =  8.87
LONGEST FLOWPATH FROM NODE  1807.00 TO NODE  1817.00 = 7796.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  1817.00 TO NODE  1818.00 IS CODE = 51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   675.00  DOWNSTREAM(FEET) =   640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  805.00   CHANNEL SLOPE = 0.0435
  CHANNEL BASE(FEET) =  20.00   "Z" FACTOR =  5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.265
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   428.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.99
  AVERAGE FLOW DEPTH(FEET) =  1.55   TRAVEL TIME(MIN.) =  1.34
  Tc(MIN.) = 19.69
  SUBAREA AREA(ACRES) =   22.48       SUBAREA RUNOFF(CFS) =   25.69
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =   369.90        PEAK FLOW RATE(CFS) =    422.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.54   FLOW VELOCITY(FEET/SEC.) =  9.94
  LONGEST FLOWPATH FROM NODE  1807.00 TO NODE  1818.00 = 8601.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  1818.00 TO NODE  1818.00 IS CODE = 10
--------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE  1819.00 TO NODE  1820.00 IS CODE = 21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1953.00
  DOWNSTREAM ELEVATION(FEET) =   1940.00
  ELEVATION DIFFERENCE(FEET) =    13.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =     0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

**************************************************************************
  FLOW PROCESS FROM NODE  1820.00 TO NODE  1821.00 IS CODE = 51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1940.00  DOWNSTREAM(FEET) =  1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 2582.00   CHANNEL SLOPE = 0.3021
  CHANNEL BASE(FEET) =   5.00   "Z" FACTOR =  2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.936
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    20.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.47
  AVERAGE FLOW DEPTH(FEET) =  0.34   TRAVEL TIME(MIN.) =  4.11
  Tc(MIN.) = 10.38
```

```
   SUBAREA AREA(ACRES) =    22.63      SUBAREA RUNOFF(CFS) =   39.10
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      22.73       PEAK FLOW RATE(CFS) =      39.27

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.50   FLOW VELOCITY(FEET/SEC.) = 13.07
   LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1821.00 = 2682.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1821.00 TO NODE   1822.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1160.00 DOWNSTREAM(FEET) =   1030.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   476.00   CHANNEL SLOPE = 0.2731
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.747
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    60.89
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.27
   AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   0.65
   Tc(MIN.) =  11.02
   SUBAREA AREA(ACRES) =    26.02      SUBAREA RUNOFF(CFS) =   43.23
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      48.75       PEAK FLOW RATE(CFS) =      81.00

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.54   FLOW VELOCITY(FEET/SEC.) = 13.62
   LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1822.00 = 3158.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1822.00 TO NODE   1822.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =  11.02
   RAINFALL INTENSITY(INCH/HR) =   4.75
   TOTAL STREAM AREA(ACRES) =    48.75
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    81.00

****************************************************************************
   FLOW PROCESS FROM NODE   1823.00 TO NODE   1824.00 IS CODE =  21
----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =   0
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1953.00
   DOWNSTREAM ELEVATION(FEET) =   1940.00
   ELEVATION DIFFERENCE(FEET) =    13.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
   SUBAREA RUNOFF(CFS) =      0.41
   TOTAL AREA(ACRES) =       0.17   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
   FLOW PROCESS FROM NODE   1824.00 TO NODE   1825.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1940.00 DOWNSTREAM(FEET) =   1300.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1710.00   CHANNEL SLOPE = 0.3743
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    2.000
```

```
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.525
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    22.97
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.66
 AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   2.44
 Tc(MIN.) =   8.71
 SUBAREA AREA(ACRES) =    23.04       SUBAREA RUNOFF(CFS) =   44.55
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     23.21         PEAK FLOW RATE(CFS) =     44.88

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) = 14.68
 LONGEST FLOWPATH FROM NODE  1823.00 TO NODE  1825.00 = 1810.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE  1825.00 TO NODE  1822.00 IS CODE =  51
---------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1030.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1178.00   CHANNEL SLOPE =  0.2292
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.943
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    65.85
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.95
 AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   1.64
 Tc(MIN.) =  10.35
 SUBAREA AREA(ACRES) =    24.22       SUBAREA RUNOFF(CFS) =   41.90
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =      47.43         PEAK FLOW RATE(CFS) =     82.05

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) = 12.94
 LONGEST FLOWPATH FROM NODE  1823.00 TO NODE  1822.00 = 2988.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE  1822.00 TO NODE  1822.00 IS CODE =   1
---------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.35
 RAINFALL INTENSITY(INCH/HR) =  4.94
 TOTAL STREAM AREA(ACRES) =   47.43
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    82.05

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1       81.00     11.02       4.747        48.75
    2       82.05     10.35       4.943        47.43

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      158.14     10.35       4.943
    2      159.81     11.02       4.747

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    159.81   Tc(MIN.) =   11.02
```

```
  TOTAL AREA(ACRES) =      96.18
  LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1822.00 = 3158.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1822.00 TO NODE   1826.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =   1000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   399.00   CHANNEL SLOPE =  0.0752
  CHANNEL BASE(FEET) =    40.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.521
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    177.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.68
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   0.87
  Tc(MIN.) =  11.89
  SUBAREA AREA(ACRES) =     22.86       SUBAREA RUNOFF(CFS) =    36.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     119.04       PEAK FLOW RATE(CFS) =     188.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   7.88
  LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1826.00 = 3557.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1826.00 TO NODE   1827.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    990.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   262.00   CHANNEL SLOPE =  0.0382
  CHANNEL BASE(FEET) =    40.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.368
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    212.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.68
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   0.65
  Tc(MIN.) =  12.54
  SUBAREA AREA(ACRES) =     31.83       SUBAREA RUNOFF(CFS) =    48.66
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     150.87       PEAK FLOW RATE(CFS) =     230.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1827.00 = 3819.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1827.00 TO NODE   1828.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.00  DOWNSTREAM(FEET) =    810.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1054.00   CHANNEL SLOPE =  0.1708
  CHANNEL BASE(FEET) =    40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.053
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    255.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.40
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =  14.08
```

```
    SUBAREA AREA(ACRES) =    34.41      SUBAREA RUNOFF(CFS) =    48.81
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =     185.28        PEAK FLOW RATE(CFS) =      262.83

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =  11.58
    LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1828.00 = 4873.00 FEET.

****************************************************************************
    FLOW PROCESS FROM NODE   1828.00 TO NODE   1829.00 IS CODE =  51
--------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    810.00  DOWNSTREAM(FEET) =    780.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1005.00   CHANNEL SLOPE = 0.0299
    CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   3.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.652
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    276.10
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
    AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   2.47
    Tc(MIN.) =  16.55
    SUBAREA AREA(ACRES) =    20.77      SUBAREA RUNOFF(CFS) =    26.55
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =     206.05        PEAK FLOW RATE(CFS) =      263.35

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =  6.65
    LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1829.00 = 5878.00 FEET.

****************************************************************************
    FLOW PROCESS FROM NODE   1829.00 TO NODE   1830.00 IS CODE =  51
--------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    780.00  DOWNSTREAM(FEET) =    745.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =  735.00   CHANNEL SLOPE = 0.0476
    CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.448
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    276.98
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.97
    AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   1.54
    Tc(MIN.) =  18.09
    SUBAREA AREA(ACRES) =    22.60      SUBAREA RUNOFF(CFS) =    27.28
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =     228.65        PEAK FLOW RATE(CFS) =      275.96

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =  7.94
    LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1830.00 = 6613.00 FEET.

****************************************************************************
    FLOW PROCESS FROM NODE   1830.00 TO NODE   1818.00 IS CODE =  51
--------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    745.00  DOWNSTREAM(FEET) =    640.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1126.00   CHANNEL SLOPE = 0.0933
    CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   3.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.249
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
```

```
    S.C.S. CURVE NUMBER (AMC II) =    0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    284.98
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.72
    AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   1.75
    Tc(MIN.) =  19.84
    SUBAREA AREA(ACRES) =    15.87      SUBAREA RUNOFF(CFS) =   18.05
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =    244.52       PEAK FLOW RATE(CFS) =    278.04

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) = 10.64
    LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1818.00 = 7739.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1818.00 TO NODE   1818.00 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       278.04    19.84        3.249       244.52
   LONGEST FLOWPATH FROM NODE   1819.00 TO NODE   1818.00 = 7739.00 FEET.

   ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM     RUNOFF     Tc         INTENSITY    AREA
   NUMBER     (CFS)     (MIN.)    (INCH/HOUR)   (ACRE)
      1       422.70    19.69        3.265       369.90
   LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1818.00 = 8601.00 FEET.

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF       Tc       INTENSITY
   NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
      1       698.61     19.69       3.265
      2       698.65     19.84       3.249

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    698.65   Tc(MIN.) =   19.84
  TOTAL AREA(ACRES) =    614.42

****************************************************************************
  FLOW PROCESS FROM NODE   1818.00 TO NODE   1818.00 IS CODE =  12
--------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
==========================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1818.00 TO NODE   1831.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    640.00  DOWNSTREAM(FEET) =    595.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1054.00   CHANNEL SLOPE =  0.0427
    CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.078
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =    0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    708.53
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.16
    AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   1.73
    Tc(MIN.) =  21.57
    SUBAREA AREA(ACRES) =    18.33      SUBAREA RUNOFF(CFS) =   19.75
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =    632.75       PEAK FLOW RATE(CFS) =    698.65

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) = 10.09
    LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1831.00 = 9655.00 FEET.
```

```
*****************************************************************************
  FLOW PROCESS FROM NODE   1831.00 TO NODE   1832.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    595.00  DOWNSTREAM(FEET) =    538.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   876.00   CHANNEL SLOPE =  0.0651
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.984
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    713.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.65
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   1.07
  Tc(MIN.) =  22.64
  SUBAREA AREA(ACRES) =    28.00       SUBAREA RUNOFF(CFS) =   29.24
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     660.75       PEAK FLOW RATE(CFS) =     698.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.56   FLOW VELOCITY(FEET/SEC.) = 13.53
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1832.00 = 10531.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1832.00 TO NODE   1833.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    538.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.00   CHANNEL SLOPE =  0.0334
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.797
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    710.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.00
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   2.39
  Tc(MIN.) =  25.03
  SUBAREA AREA(ACRES) =    24.92       SUBAREA RUNOFF(CFS) =   24.39
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =     685.67       PEAK FLOW RATE(CFS) =     698.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.60   FLOW VELOCITY(FEET/SEC.) =  9.93
  LONGEST FLOWPATH FROM NODE   1807.00 TO NODE   1833.00 = 11966.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1833.00 TO NODE   1833.00 IS CODE =  10
-----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   1834.00 TO NODE   1835.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    882.00
  DOWNSTREAM ELEVATION(FEET) =   877.00
  ELEVATION DIFFERENCE(FEET) =     5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.887
  SUBAREA RUNOFF(CFS) =      0.23
```

```
   TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.23

*****************************************************************************
  FLOW PROCESS FROM NODE   1835.00 TO NODE   1836.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    877.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1264.00   CHANNEL SLOPE = 0.1994
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.771
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    20.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.92
  AVERAGE FLOW DEPTH(FEET) =  0.25   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =  10.94
  SUBAREA AREA(ACRES) =     23.79      SUBAREA RUNOFF(CFS) =   39.72
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      23.90        PEAK FLOW RATE(CFS) =      39.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =  8.80
  LONGEST FLOWPATH FROM NODE   1834.00 TO NODE   1836.00 = 1364.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1836.00 TO NODE   1837.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    625.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1155.00   CHANNEL SLOPE = 0.0823
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.193
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    55.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.94
  AVERAGE FLOW DEPTH(FEET) =  0.61   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =  13.36
  SUBAREA AREA(ACRES) =    21.02      SUBAREA RUNOFF(CFS) =   30.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      44.92        PEAK FLOW RATE(CFS) =      65.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =  8.45
  LONGEST FLOWPATH FROM NODE   1834.00 TO NODE   1837.00 = 2519.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1837.00 TO NODE   1837.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.36
  RAINFALL INTENSITY(INCH/HR) =   4.19
  TOTAL STREAM AREA(ACRES) =   44.92
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    65.92

*****************************************************************************
  FLOW PROCESS FROM NODE   1838.00 TO NODE   1839.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
```

```
    S.C.S. CURVE NUMBER (AMC II) =   0
    INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
    UPSTREAM ELEVATION(FEET) =   1670.00
    DOWNSTREAM ELEVATION(FEET) =   1660.00
    ELEVATION DIFFERENCE(FEET) =     10.00
    SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
    WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
    SUBAREA RUNOFF(CFS) =      0.33
    TOTAL AREA(ACRES) =       0.14   TOTAL RUNOFF(CFS) =        0.33


******************************************************************************
    FLOW PROCESS FROM NODE   1839.00 TO NODE   1840.00 IS CODE =  51
------------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
    ELEVATION DATA: UPSTREAM(FEET) =   1640.00  DOWNSTREAM(FEET) =   1120.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1553.00   CHANNEL SLOPE = 0.3348
    CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =   2.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.686
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     32.23
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.53
    AVERAGE FLOW DEPTH(FEET) =    0.44   TRAVEL TIME(MIN.) =    2.07
    Tc(MIN.) =    8.33
    SUBAREA AREA(ACRES) =     31.71       SUBAREA RUNOFF(CFS) =   63.11
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      31.85        PEAK FLOW RATE(CFS) =      63.39

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) = 15.66
    LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1840.00 = 1653.00 FEET.

******************************************************************************
    FLOW PROCESS FROM NODE   1840.00 TO NODE   1841.00 IS CODE =  51
------------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
    ELEVATION DATA: UPSTREAM(FEET) =   1120.00  DOWNSTREAM(FEET) =    740.00
    CHANNEL LENGTH THRU SUBAREA(FEET) = 1572.00   CHANNEL SLOPE = 0.2417
    CHANNEL BASE(FEET) =    10.00   "Z" FACTOR =   2.000
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.982
    *USER SPECIFIED(SUBAREA):
    ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
    S.C.S. CURVE NUMBER (AMC II) =   0
    TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     95.15
    TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.82
    AVERAGE FLOW DEPTH(FEET) =    0.61   TRAVEL TIME(MIN.) =    1.90
    Tc(MIN.) =  10.23
    SUBAREA AREA(ACRES) =     36.36       SUBAREA RUNOFF(CFS) =   63.40
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =      68.21        PEAK FLOW RATE(CFS) =     118.94

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) = 14.97
    LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1841.00 = 3225.00 FEET.

******************************************************************************
    FLOW PROCESS FROM NODE   1841.00 TO NODE   1842.00 IS CODE =  51
------------------------------------------------------------------------------
    >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
    >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    710.00
    CHANNEL LENGTH THRU SUBAREA(FEET) =  298.00   CHANNEL SLOPE = 0.1007
    CHANNEL BASE(FEET) =    20.00   "Z" FACTOR =   1.500
    MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
```

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  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.830
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   138.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.88
 AVERAGE FLOW DEPTH(FEET) =  0.67   TRAVEL TIME(MIN.) =  0.50
 Tc(MIN.) = 10.73
 SUBAREA AREA(ACRES) =   23.38      SUBAREA RUNOFF(CFS) =   39.52
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =    91.59        PEAK FLOW RATE(CFS) =    154.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71   FLOW VELOCITY(FEET/SEC.) = 10.29
 LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1842.00 = 3523.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   1842.00 TO NODE   1843.00 IS CODE = 51
 --------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   710.00 DOWNSTREAM(FEET) =   670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   809.00   CHANNEL SLOPE = 0.0494
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.421
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   171.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.54
  AVERAGE FLOW DEPTH(FEET) =  0.94   TRAVEL TIME(MIN.) =  1.58
  Tc(MIN.) = 12.31
  SUBAREA AREA(ACRES) =   21.00      SUBAREA RUNOFF(CFS) =   32.49
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =   112.59        PEAK FLOW RATE(CFS) =    174.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.95   FLOW VELOCITY(FEET/SEC.) =  8.57
  LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1843.00 = 4332.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   1843.00 TO NODE   1837.00 IS CODE = 51
 --------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   670.00 DOWNSTREAM(FEET) =   530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.00   CHANNEL SLOPE = 0.0674
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.737
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   191.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.45
  AVERAGE FLOW DEPTH(FEET) =  0.90   TRAVEL TIME(MIN.) =  3.66
  Tc(MIN.) = 15.97
  SUBAREA AREA(ACRES) =   27.05      SUBAREA RUNOFF(CFS) =   35.38
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =   139.64        PEAK FLOW RATE(CFS) =    182.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.87   FLOW VELOCITY(FEET/SEC.) =  9.25
  LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1837.00 = 6409.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   1837.00 TO NODE   1837.00 IS CODE =  1
 --------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) = 15.97
  RAINFALL INTENSITY(INCH/HR) =  3.74
  TOTAL STREAM AREA(ACRES) =  139.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   182.64

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc      INTENSITY      AREA
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      65.92     13.36       4.193        44.92
     2     182.64     15.97       3.737       139.64

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
     1     218.72     13.36       4.193
     2     241.39     15.97       3.737

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   241.39   Tc(MIN.) =   15.97
  TOTAL AREA(ACRES) =   184.56
  LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1837.00 = 6409.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1837.00 TO NODE   1844.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   530.00  DOWNSTREAM(FEET) =   520.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   227.00   CHANNEL SLOPE = 0.0441
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.669
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   247.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   0.46
  Tc(MIN.) =  16.44
  SUBAREA AREA(ACRES) =     9.67      SUBAREA RUNOFF(CFS) =   12.42
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =   194.23      PEAK FLOW RATE(CFS) =    249.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.95   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE   1838.00 TO NODE   1844.00 = 6636.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1844.00 TO NODE   1833.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   520.00  DOWNSTREAM(FEET) =   490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   848.00   CHANNEL SLOPE = 0.0354
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.404
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   257.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.98
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   2.02
  Tc(MIN.) =  18.46
  SUBAREA AREA(ACRES) =    14.04      SUBAREA RUNOFF(CFS) =   16.73
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =    208.27         PEAK FLOW RATE(CFS) =     249.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.85   FLOW VELOCITY(FEET/SEC.) =  6.88
  LONGEST FLOWPATH FROM NODE  1838.00 TO NODE  1833.00 = 7484.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE  1833.00 TO NODE  1833.00 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       249.41   18.46      3.404      208.27
  LONGEST FLOWPATH FROM NODE  1838.00 TO NODE  1833.00 = 7484.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF    Tc      INTENSITY    AREA
  NUMBER     (CFS)    (MIN.)   (INCH/HOUR)  (ACRE)
     1       698.65   25.03      2.797      685.67
  LONGEST FLOWPATH FROM NODE  1807.00 TO NODE  1833.00 = 11966.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)      (MIN.)    (INCH/HOUR)
     1       764.57     18.46       3.404
     2       903.56     25.03       2.797

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    903.56   Tc(MIN.) =   25.03
  TOTAL AREA(ACRES) =    893.94

*****************************************************************************
  FLOW PROCESS FROM NODE  1833.00 TO NODE  1833.00 IS CODE =  12
-----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
=============================================================================

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

*****************************************************************************
  FLOW PROCESS FROM NODE  1901.00 TO NODE  1902.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1458.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =       0.12

*****************************************************************************
  FLOW PROCESS FROM NODE  1902.00 TO NODE  1903.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1458.00  DOWNSTREAM(FEET) =    695.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 2091.00   CHANNEL SLOPE =  0.3649
```

```
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.933
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    17.52
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.46
 AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   4.12
 Tc(MIN.) =  10.38
 SUBAREA AREA(ACRES) =    19.62      SUBAREA RUNOFF(CFS) =   33.88
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     19.67       PEAK FLOW RATE(CFS) =      33.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) = 10.66
 LONGEST FLOWPATH FROM NODE  1901.00 TO NODE  1903.00 = 2191.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE  1903.00 TO NODE  1904.00 IS CODE = 51
 ---------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    695.00  DOWNSTREAM(FEET) =    535.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1259.00   CHANNEL SLOPE = 0.1271
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.380
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    50.77
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.98
 AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   2.10
 Tc(MIN.) =  12.49
 SUBAREA AREA(ACRES) =    21.89      SUBAREA RUNOFF(CFS) =   33.56
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     41.56       PEAK FLOW RATE(CFS) =      63.72

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) = 10.66
 LONGEST FLOWPATH FROM NODE  1901.00 TO NODE  1904.00 = 3450.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE  1904.00 TO NODE  1905.00 IS CODE = 51
 ---------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    535.00  DOWNSTREAM(FEET) =    510.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  498.00   CHANNEL SLOPE = 0.0502
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.135
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    76.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.10
 AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   1.17
 Tc(MIN.) =  13.65
 SUBAREA AREA(ACRES) =    17.44      SUBAREA RUNOFF(CFS) =   25.24
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =     59.00       PEAK FLOW RATE(CFS) =      85.38

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =  7.33
 LONGEST FLOWPATH FROM NODE  1901.00 TO NODE  1905.00 = 3948.00 FEET.

+---------------------------------------------------------------------------+
| End stream at Culvert #19.                                                |
|                                                                           |
```

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

******************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2002.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1452.00
  ELEVATION DIFFERENCE(FEET) =     28.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =       0.14
  TOTAL AREA(ACRES) =        0.06   TOTAL RUNOFF(CFS) =        0.14

******************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE   2003.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1452.00 DOWNSTREAM(FEET) =    780.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1708.00   CHANNEL SLOPE = 0.3934
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.912
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.80
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   4.19
  Tc(MIN.) =  10.45
  SUBAREA AREA(ACRES) =    10.55      SUBAREA RUNOFF(CFS) =   18.14
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     10.61        PEAK FLOW RATE(CFS) =     18.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2003.00 = 1808.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2004.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    780.00 DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1212.00   CHANNEL SLOPE = 0.1609
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.369
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     30.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.70
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =  12.54
  SUBAREA AREA(ACRES) =    16.10      SUBAREA RUNOFF(CFS) =   24.62
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =     26.71        PEAK FLOW RATE(CFS) =     40.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   FLOW VELOCITY(FEET/SEC.) = 10.66
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2004.00 = 3020.00 FEET.
```

```
******************************************************************************
  FLOW PROCESS FROM NODE  2004.00 TO NODE  2005.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   763.00   CHANNEL SLOPE =  0.0917
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.056
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =    0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     65.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.31
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =  14.07
  SUBAREA AREA(ACRES) =    34.53       SUBAREA RUNOFF(CFS) =   49.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      61.24       PEAK FLOW RATE(CFS) =      86.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   9.11
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2005.00 = 3783.00 FEET.


  +----------------------------------------------------------------------------+
  | End stream at Culvert #20.                                                 |
  |                                                                            |
  |                                                                            |
  +----------------------------------------------------------------------------+
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     61.24  TC(MIN.) =     14.07
  PEAK FLOW RATE(CFS)   =     86.94
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

CHAPTER 3

100-Year Hydrologic Model
for
Existing Conditions

3.2 – Unit Hydrograph Hydrologic Analysis
(HEC HMS)

OTAY RANCH VILLAGE 13

Existing Conditions
Runoff to Culvert No. 7

DRAINAGE	461.7 acres	
AREA	0.721	mi^2

CN = 98	0	acres	(Major Arterials)
CN = 92	0	acres	(Commercial Development)
CN = 91	0	acres	(Mixed Use - Schools, Hospital)
CN = 90	0	acres	(High Density Residential Development)
CN = 87	0	acres	(Single-Family Residential Development)
CN = 82	461.71	acres	(Open Space)

CURVE NUMBER =	82.0	AMC=2.0
	87.0	AMC=2.5

Average n	0.05	
m	0.38	
L	1.84	miles
Lc	0.95	miles
U/S Elev.	1720	feet
D/S Elev.	500	feet
S	663	ft/mile

LAG TIME =	0.432	hours
	25.9	min

SOIL GROUP D ASSUMED

OTAY RANCH VILLAGE 13

Existing Conditions
Runoff to Culvert No. 18

DRAINAGE	893.9 acres	
AREA	1.397	mi²

CN = 98	0	acres	(Major Arterials)
CN = 92	0	acres	(Commercial Development)
CN = 91	0	acres	(Mixed Use - Schools, Hospital)
CN = 90	0	acres	(High Density Residential Development)
CN = 87	0	acres	(Single-Family Residential Development)
CN = 81	893.94	acres	(Open Space)

CURVE NUMBER =	81.0	AMC=2.0
	86.5	AMC=2.5

Average n	0.05	
m	0.38	
L	2.02	miles
Lc	1.01	miles
U/S Elev.	770	feet
D/S Elev.	505	feet
S	131.19	ft/mile

LAG TIME =	0.623	hours
	37.4	min

SOIL GROUP D ASSUMED

Table 4-10

RUNOFF CURVE NUMBERS FOR PZN CONDITIONS 1.0, 2.0, AND 3.0

CN For:			CN For:		
PZN Condition = 1.0	PZN Condition = 2.0	PZN Condition = 3.0	PZN Condition = 1.0	PZN Condition = 2.0	PZN Condition = 3.0
100	100	100	40	60	78
97	99	100	39	59	77
94	98	99	38	58	76
91	97	99	37	57	75
89	96	99	37	56	75
87	95	98	34	55	73
85	94	98	34	54	73
83	93	98	33	53	72
81	92	97	32	52	71
80	91	97	31	51	70
78	90	96	31	50	70
76	89	96	30	49	69
75	88	95	29	48	68
73	87	95	28	47	67
72	86	94	27	46	66
70	85	94	26	45	65
68	84	93	25	44	64
67	83	93	25	43	63
66	82 *[87]*	92	24	42	62
64	81 *[86.5]*	92	23	41	61
63	80	91	22	40	60
62	79	91	21	39	59
60	78	90	21	38	58
59	77	89	20	37	57
58	76	89	19	36	56
57	75	88	18	35	55
55	74	88	18	34	54
54	73	87	17	33	53
53	72	86	16	32	52
52	71	86	16	31	51
51	70	85	15	30	50
50	69	84			
48	68	84	12	25	43
47	67	83	9	20	37
46	66	82	6	15	30
45	65	82	4	10	22
44	64	81	2	5	13
43	63	80	0	0	0
42	62	79			
41	61	78			

4-47

SUBAREA TO CULV-7   SUBAREA TO CULV-18

CULV-7   CULV-18

Project: Otay Ranch Resort   Simulation Run: 100 year - Existing

Start of Run: 13Nov2003, 00:00   Basin Model: Existing
End of Run: 14Nov2003, 00:00   Meteorologic Model: Otay Resort Rainfall
Compute Time: 08Dec2010, 13:41:16   Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
CULV-18	1.397	896.5	13Nov2003, 04:45	122.1
CULV-7	0.721	568.6	13Nov2003, 04:30	64.5
SUBAREA TO CULV-18	1.397	896.5	13Nov2003, 04:45	122.1
SUBAREA TO CULV-7	0.721	568.6	13Nov2003, 04:30	64.5

Subbasin "SUBAREA TO CULV-18" Results for Run "100 year - Existing"
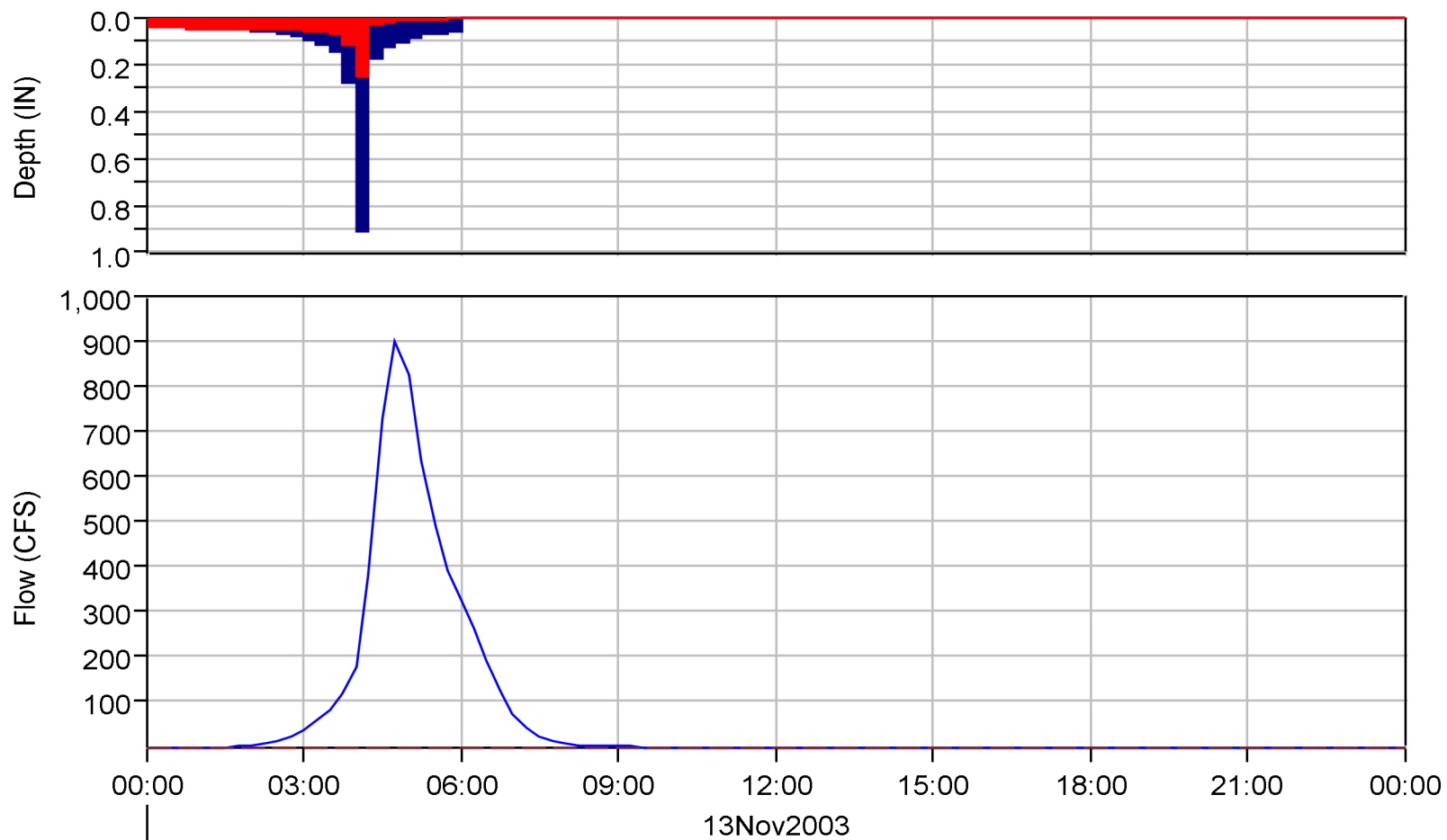
Legend:
- Run:100 year - Existing Element:SUBAREA TO CULV-18 Result:Precipitation
- Run:100 year - Existing Element:SUBAREA TO CULV-18 Result:Precipitation Loss
- Run:100 year - Existing Element:SUBAREA TO CULV-18 Result:Outflow
- Run:100 year - Existing Element:SUBAREA TO CULV-18 Result:Baseflow

Junction "CULV-18" Results for Run "100 year - Existing"
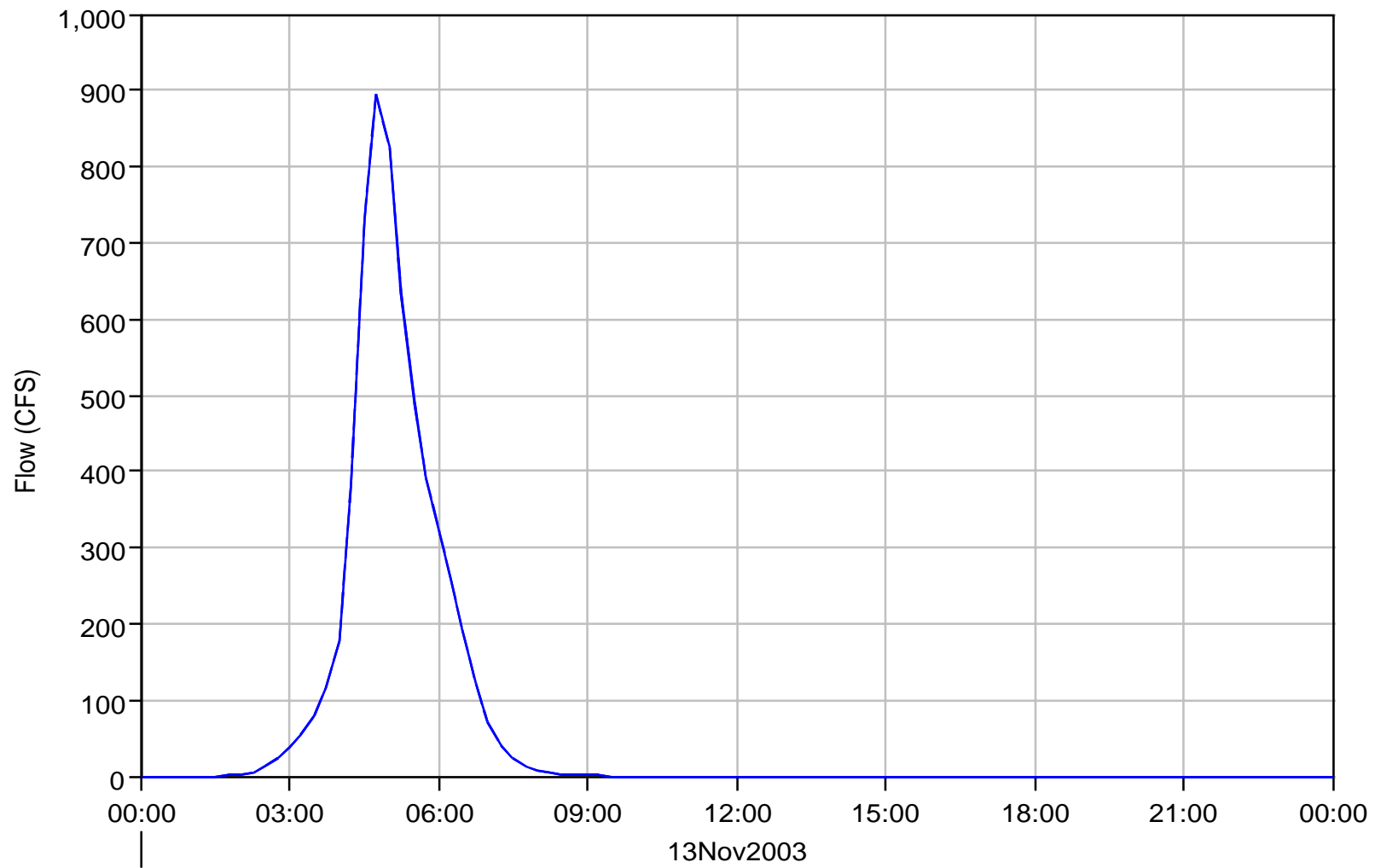
Run:100 year - Existing Element:CULV-18 Result:Outflow

Run:100 year - Existing Element:SUBAREA TO CULV-18 Result:Outflow

Junction "CULV-7" Results for Run "100 year - Existing"
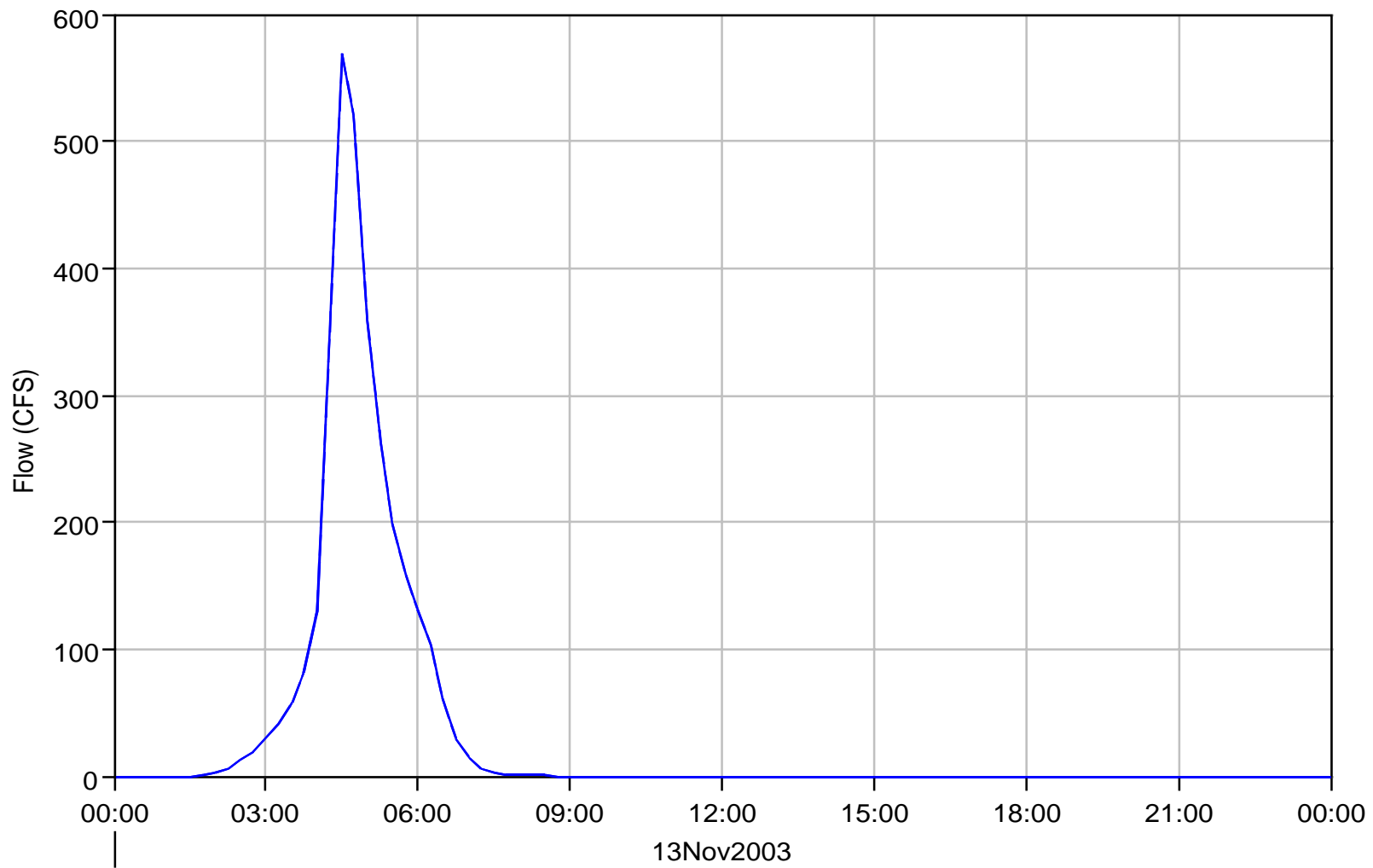
Run:100 year - Existing Element:CULV-7 Result:Outflow

Run:100 year - Existing Element:SUBAREA TO CULV-7 Result:Outflow

Subbasin "SUBAREA TO CULV-7" Results for Run "100 year - Existing"
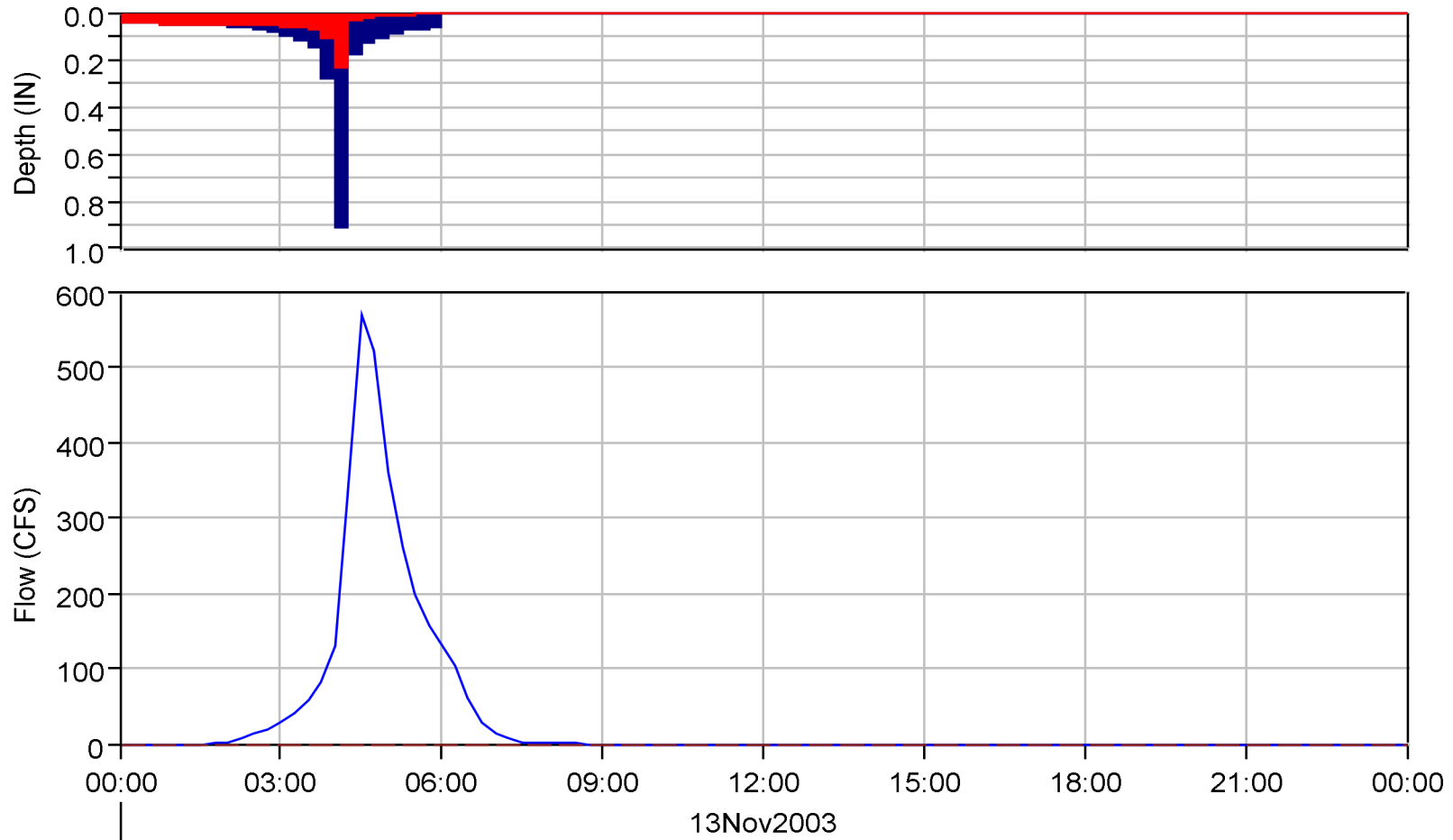
Run:100 year - Existing Element:SUBAREA TO CULV-7 Result:Precipitation

Run:100 YEAR - EXISTING Element:SUBAREA TO CULV-7 Result:Precipitation Loss

Run:100 year - Existing Element:SUBAREA TO CULV-7 Result:Outflow

Run:100 YEAR - EXISTING Element:SUBAREA TO CULV-7 Result:Baseflow

CHAPTER 4

100-Year Hydrologic Model
for
Developed Conditions

CHAPTER 4

100-Year Hydrologic Model
for
Developed Conditions

4.1 – Rational Method Hydrologic Analysis
(AES 2010)

```
_____
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                    2003,1985,1981 HYDROLOGY MANUAL
            (c) Copyright 1982-2010 Advanced Engineering Software (aes)
              Ver. 17.0 Release Date: 07/01/2010  License ID 1239


                        Analysis prepared by:


                  Hunsaker & Associates San Diego, Inc.
                        9707 Waples Street
                        San Diego, CA  92121


  ************************** DESCRIPTION OF STUDY **************************
  * Village 13 Proposed Condition Model.                                 *
  * 100-year return interval.                                            *
  *                                                                      *
  **************************************************************************

   FILE NAME: R:\0982\HYD\CALCS\AES\Q100\PR-100.DAT
   TIME/DATE OF STUDY: 16:27 07/17/2014
 ------------------------------------------------------------------------------
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ------------------------------------------------------------------------------
   2003 SAN DIEGO MANUAL CRITERIA

   USER SPECIFIED STORM EVENT(YEAR) = 100.00
   6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
   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  47.0    35.0     0.020/0.020/0.020   0.50   2.00 0.0313 0.125 0.0150
   2  28.0    16.0     0.020/0.020/0.020   0.50   1.50 0.0313 0.125 0.0150

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

 ****************************************************************************
   FLOW PROCESS FROM NODE  2401.00 TO NODE  2402.00 IS CODE =  21
 ------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ==========================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =    643.00
   DOWNSTREAM ELEVATION(FEET) =    640.00
   ELEVATION DIFFERENCE(FEET) =     3.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   9.361
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.275
   SUBAREA RUNOFF(CFS) =      0.46
   TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.46

 ****************************************************************************
   FLOW PROCESS FROM NODE  2402.00 TO NODE  2403.00 IS CODE =  51
 ------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    640.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1590.00   CHANNEL SLOPE = 0.0692
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.973
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.13
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   5.17
  Tc(MIN.) =   14.53
  SUBAREA AREA(ACRES) =    25.44       SUBAREA RUNOFF(CFS) =   35.37
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        25.7       PEAK FLOW RATE(CFS) =       35.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE   2401.00 TO NODE   2403.00 =   1690.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2403.00 TO NODE   2404.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    520.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.10
  ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.72
  PIPE TRAVEL TIME(MIN.) =   0.19   Tc(MIN.) =   14.72
  LONGEST FLOWPATH FROM NODE   2401.00 TO NODE   2404.00 =   1890.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2403.00 TO NODE   2404.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.939
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4024
  SUBAREA AREA(ACRES) =    3.87   SUBAREA RUNOFF(CFS) =   11.43
  TOTAL AREA(ACRES) =        29.6   TOTAL RUNOFF(CFS) =      46.85
  TC(MIN.) =   14.72

+-----------------------------------------------------------------------------+
| Discharge at Culvert 1A.                                                    |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE   2601.00 TO NODE   2602.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    630.00
  DOWNSTREAM ELEVATION(FEET) =    620.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.24

****************************************************************************
  FLOW PROCESS FROM NODE  2602.00 TO NODE  2603.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   620.00  DOWNSTREAM(FEET) =    535.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  605.00   CHANNEL SLOPE = 0.1405
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR = 10.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.370
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.55
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   2.84
  Tc(MIN.) =    9.10
  SUBAREA AREA(ACRES) =     4.63       SUBAREA RUNOFF(CFS) =    8.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.7       PEAK FLOW RATE(CFS) =       8.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.17   FLOW VELOCITY(FEET/SEC.) =   4.45
  LONGEST FLOWPATH FROM NODE  2601.00 TO NODE  2603.00 =    705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  2603.00 TO NODE  2604.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   535.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.06
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.89
  PIPE TRAVEL TIME(MIN.) =   0.08   Tc(MIN.) =    9.19
  LONGEST FLOWPATH FROM NODE  2601.00 TO NODE  2604.00 =    805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  2603.00 TO NODE  2604.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.339
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4424
  SUBAREA AREA(ACRES) =   1.42   SUBAREA RUNOFF(CFS) =    5.69
  TOTAL AREA(ACRES) =        6.2   TOTAL RUNOFF(CFS) =     14.52
  TC(MIN.) =    9.19

+---------------------------------------------------------------------------+
| Discharge at Culvert 1B.                                                  |
|                                                                           |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE  2501.00 TO NODE  2502.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    641.00
 DOWNSTREAM ELEVATION(FEET) =    640.00
 ELEVATION DIFFERENCE(FEET) =     1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.029
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.045
 SUBAREA RUNOFF(CFS) =      0.26
 TOTAL AREA(ACRES) =       0.15   TOTAL RUNOFF(CFS) =      0.26


******************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2503.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     640.00  DOWNSTREAM(FEET) =    500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1510.00   CHANNEL SLOPE = 0.0927
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.016
  *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.37
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.91
 AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   4.26
 Tc(MIN.) =   14.29
 SUBAREA AREA(ACRES) =    29.53       SUBAREA RUNOFF(CFS) =   41.50
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        29.7        PEAK FLOW RATE(CFS) =     41.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE   2501.00 TO NODE   2503.00 =   1580.00 FEET.


******************************************************************************
  FLOW PROCESS FROM NODE   2503.00 TO NODE   2504.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   500.00  DOWNSTREAM(FEET) =   485.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 26.89
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     41.72
  PIPE TRAVEL TIME(MIN.) =   0.06   Tc(MIN.) =   14.35
  LONGEST FLOWPATH FROM NODE   2501.00 TO NODE   2504.00 =   1680.00 FEET.


******************************************************************************
  FLOW PROCESS FROM NODE   2503.00 TO NODE   2504.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.005
  *USER SPECIFIED(SUBAREA):
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .7500
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3767
 SUBAREA AREA(ACRES) =    2.12   SUBAREA RUNOFF(CFS) =    6.37
 TOTAL AREA(ACRES) =        31.8   TOTAL RUNOFF(CFS) =      47.97
 TC(MIN.) =   14.35


+----------------------------------------------------------------------------+
| Discharge at Culvert 2                                                     |
|                                                                            |
|                                                                            |
|                                                                            |
```

```
+----------------------------------------------------------------------+
|                                                                      |
+----------------------------------------------------------------------+
| Culvert #3 not analyzed per this report.                             |
|                                                                      |
|                                                                      |
|                                                                      |
+----------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE   1002.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   642.00
  DOWNSTREAM ELEVATION(FEET) =   622.00
  ELEVATION DIFFERENCE(FEET) =    20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      1.43
  TOTAL AREA(ACRES) =       0.60   TOTAL RUNOFF(CFS) =      1.43

*******************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1003.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   622.00  DOWNSTREAM(FEET) =   495.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  665.00   CHANNEL SLOPE = 0.1910
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.916
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.07
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.57
  Tc(MIN.) =    7.84
  SUBAREA AREA(ACRES) =      8.54       SUBAREA RUNOFF(CFS) =   17.68
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =     18.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   FLOW VELOCITY(FEET/SEC.) =  8.73
  LONGEST FLOWPATH FROM NODE   1001.00 TO NODE   1003.00 =    765.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1004.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   495.00  DOWNSTREAM(FEET) =   490.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 13.91
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.93
  PIPE TRAVEL TIME(MIN.) =   0.13   Tc(MIN.) =    7.97
  LONGEST FLOWPATH FROM NODE   1001.00 TO NODE   1004.00 =    875.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1004.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.853
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5195
  SUBAREA AREA(ACRES) =     6.72   SUBAREA RUNOFF(CFS) =   29.50
  TOTAL AREA(ACRES) =        15.9   TOTAL RUNOFF(CFS) =      48.22
  TC(MIN.) =     7.97


+------------------------------------------------------------------------------+
| Discharge at Culvert #4.                                                     |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE   1101.00 TO NODE   1102.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =   1035.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   6.833
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =       0.24   TOTAL RUNOFF(CFS) =       0.57

********************************************************************************
  FLOW PROCESS FROM NODE   1102.00 TO NODE   1103.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =     955.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   315.00   CHANNEL SLOPE =  0.2540
  CHANNEL BASE(FEET) =     4.00   "Z" FACTOR =    2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.173
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   1.07
  Tc(MIN.) =     7.34
  SUBAREA AREA(ACRES) =      1.76       SUBAREA RUNOFF(CFS) =    3.80
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =          2.0        PEAK FLOW RATE(CFS) =       4.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.16    FLOW VELOCITY(FEET/SEC.) =   6.05
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE   1103.00 =     415.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1103.00 TO NODE   1104.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     955.00  DOWNSTREAM(FEET) =     800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.00   CHANNEL SLOPE =  0.3924
  CHANNEL BASE(FEET) =     4.00   "Z" FACTOR =    2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.801
```

```
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.85
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.88
 AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   0.74
 Tc(MIN.) =    8.08
 SUBAREA AREA(ACRES) =      4.46        SUBAREA RUNOFF(CFS) =    9.06
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =         6.5         PEAK FLOW RATE(CFS) =       13.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.28   FLOW VELOCITY(FEET/SEC.) = 10.30
 LONGEST FLOWPATH FROM NODE   1101.00 TO NODE   1104.00 =    810.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1104.00 TO NODE   1105.00 IS CODE =  51
---------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    735.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE = 0.2407
 CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.597
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.78
 AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   0.46
 Tc(MIN.) =    8.54
 SUBAREA AREA(ACRES) =      4.60        SUBAREA RUNOFF(CFS) =    9.01
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        11.1         PEAK FLOW RATE(CFS) =       21.67

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43   FLOW VELOCITY(FEET/SEC.) = 10.37
 LONGEST FLOWPATH FROM NODE   1101.00 TO NODE   1105.00 =   1080.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1105.00 TO NODE    103.00 IS CODE =  31
---------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =   720.00
 FLOW LENGTH(FEET) =   645.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 11.11
 ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      21.67
 PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =     9.51
 LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    103.00 =   1725.00 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.) =    9.51
 RAINFALL INTENSITY(INCH/HR) =   5.22
 TOTAL STREAM AREA(ACRES) =    11.06
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.67

*****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  21
---------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
  UPSTREAM ELEVATION(FEET) =   807.00
  DOWNSTREAM ELEVATION(FEET) =   805.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =       0.26   TOTAL RUNOFF(CFS) =       0.83

*******************************************************************************
  FLOW PROCESS FROM NODE   102.00 TO NODE   103.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) = 805.00  DOWNSTREAM ELEVATION(FEET) = 735.00
  STREET LENGTH(FEET) =    830.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.47
  STREET FLOW TRAVEL TIME(MIN.) =   2.52   Tc(MIN.) =   9.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.094
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.567
  SUBAREA AREA(ACRES) =    4.13       SUBAREA RUNOFF(CFS) =   11.99
  TOTAL AREA(ACRES) =        4.4        PEAK FLOW RATE(CFS) =      12.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.42
  FLOW VELOCITY(FEET/SEC.) =  6.31   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  LONGEST FLOWPATH FROM NODE   101.00 TO NODE   103.00 =    925.00 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.) =   9.88
  RAINFALL INTENSITY(INCH/HR) =  5.09
  TOTAL STREAM AREA(ACRES) =    4.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    12.68

  ** CONFLUENCE DATA **
```

```
    STREAM      RUNOFF      Tc      INTENSITY     AREA
    NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
       1        21.67      9.51       5.223       11.06
       2        12.68      9.88       5.094        4.39


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

   ** PEAK FLOW RATE TABLE **
   STREAM      RUNOFF      Tc      INTENSITY
   NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1        33.87      9.51       5.223
      2        33.82      9.88       5.094


   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      33.87   Tc(MIN.) =     9.51
   TOTAL AREA(ACRES) =       15.4
   LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    103.00 =   1725.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE    103.00 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) =    735.00  DOWNSTREAM(FEET) =   730.00
   FLOW LENGTH(FEET) =     50.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 21.93
   ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =       33.87
   PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =     9.54
   LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    104.00 =   1775.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  81
-------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.209
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4485
   SUBAREA AREA(ACRES) =    4.68   SUBAREA RUNOFF(CFS) =   13.90
   TOTAL AREA(ACRES) =        20.1   TOTAL RUNOFF(CFS) =      47.03
   TC(MIN.) =    9.54

*******************************************************************************
   FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =    9.54
   RAINFALL INTENSITY(INCH/HR) =   5.21
   TOTAL STREAM AREA(ACRES) =    20.13
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     47.03

*******************************************************************************
   FLOW PROCESS FROM NODE   1106.00 TO NODE   1107.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  87
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1165.00
   DOWNSTREAM ELEVATION(FEET) =   1145.00
```

```
     ELEVATION DIFFERENCE(FEET) =      20.00
     SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
     WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
      100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
     SUBAREA RUNOFF(CFS) =      0.14
     TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =       0.14


****************************************************************************
  FLOW PROCESS FROM NODE   1107.00 TO NODE   1108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
     ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =   1125.00
     CHANNEL LENGTH THRU SUBAREA(FEET) =  220.00   CHANNEL SLOPE = 0.0909
     CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
     MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  10.00
      100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.418
     *USER SPECIFIED(SUBAREA):
     ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
     S.C.S. CURVE NUMBER (AMC II) =  87
     TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.41
     TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.35
     AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   2.71
     Tc(MIN.) =    8.98
     SUBAREA AREA(ACRES) =      0.28       SUBAREA RUNOFF(CFS) =    0.53
     AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
     TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.64

     END OF SUBAREA CHANNEL FLOW HYDRAULICS:
     DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   1.50
     LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1108.00 =     320.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE   1108.00 TO NODE   1109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
     ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =   1000.00
     CHANNEL LENGTH THRU SUBAREA(FEET) =  494.00   CHANNEL SLOPE = 0.2530
     CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
     MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
      100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.878
     *USER SPECIFIED(SUBAREA):
     ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
     S.C.S. CURVE NUMBER (AMC II) =  87
     TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.80
     TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.19
     AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   1.59
     Tc(MIN.) =   10.57
     SUBAREA AREA(ACRES) =      2.52       SUBAREA RUNOFF(CFS) =    4.30
     AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
     TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =       4.88

     END OF SUBAREA CHANNEL FLOW HYDRAULICS:
     DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   6.28
     LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1109.00 =     814.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE   1109.00 TO NODE   1110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
     ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    860.00
     CHANNEL LENGTH THRU SUBAREA(FEET) =  395.00   CHANNEL SLOPE = 0.3544
     CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
     MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
      100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.668
     *USER SPECIFIED(SUBAREA):
```

```
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 87
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.82
  AVERAGE FLOW DEPTH(FEET) =  0.23   TRAVEL TIME(MIN.) =  0.75
  Tc(MIN.) =   11.31
  SUBAREA AREA(ACRES) =      5.29      SUBAREA RUNOFF(CFS) =   8.64
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        8.1      PEAK FLOW RATE(CFS) =      13.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =  10.14
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1110.00 =   1209.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1110.00 TO NODE   1111.00 IS CODE = 51
---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    756.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE = 0.2537
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.485
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 87
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     20.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.45
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   0.72
  Tc(MIN.) =   12.04
  SUBAREA AREA(ACRES) =      9.64      SUBAREA RUNOFF(CFS) =  15.13
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       17.8      PEAK FLOW RATE(CFS) =      27.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =  10.14
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE   1111.00 =   1619.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1111.00 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) =    715.00  DOWNSTREAM(FEET) =    714.00
  FLOW LENGTH(FEET) =     50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.23
  ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     27.93
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   12.11
  LONGEST FLOWPATH FROM NODE   1106.00 TO NODE    104.00 =   1669.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.11
  RAINFALL INTENSITY(INCH/HR) =   4.47
  TOTAL STREAM AREA(ACRES) =    17.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    27.93

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

```
    1      47.03    9.54        5.209        20.13
    2      27.93   12.11        4.467        17.79


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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
    1       69.04      9.54      5.209
    2       68.26     12.11      4.467

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      69.04   Tc(MIN.) =    9.54
  TOTAL AREA(ACRES) =        37.9
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    104.00 =   1775.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 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) =    700.00
  FLOW LENGTH(FEET) =    310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 25.82
  ESTIMATED PIPE DIAMETER(INCH) = 27.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      69.04
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    9.74
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    105.00 =   2085.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.140
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4074
  SUBAREA AREA(ACRES) =    1.71   SUBAREA RUNOFF(CFS) =    4.57
  TOTAL AREA(ACRES) =        39.6   TOTAL RUNOFF(CFS) =       82.98
  TC(MIN.) =    9.74

*******************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.140
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4185
  SUBAREA AREA(ACRES) =    1.02   SUBAREA RUNOFF(CFS) =    4.46
  TOTAL AREA(ACRES) =        40.6   TOTAL RUNOFF(CFS) =       87.44
  TC(MIN.) =    9.74

*******************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.140
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4318
  SUBAREA AREA(ACRES) =    6.17   SUBAREA RUNOFF(CFS) =   16.49
```

```
   TOTAL AREA(ACRES) =      46.8   TOTAL RUNOFF(CFS) =     103.93
   TC(MIN.) =    9.74

***************************************************************************
  FLOW PROCESS FROM NODE   105.00 TO NODE    106.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   700.00  DOWNSTREAM(FEET) =   645.00
  FLOW LENGTH(FEET) =   795.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 22.34
  ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    103.93
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =   10.34
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    106.00 =   2880.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   105.00 TO NODE    106.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.948
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4356
  SUBAREA AREA(ACRES) =    2.06   SUBAREA RUNOFF(CFS) =    5.30
  TOTAL AREA(ACRES) =       48.9   TOTAL RUNOFF(CFS) =     105.34
  TC(MIN.) =   10.34

***************************************************************************
  FLOW PROCESS FROM NODE   105.00 TO NODE    106.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.948
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4442
  SUBAREA AREA(ACRES) =    1.18   SUBAREA RUNOFF(CFS) =    4.67
  TOTAL AREA(ACRES) =       50.1   TOTAL RUNOFF(CFS) =     110.01
  TC(MIN.) =   10.34

***************************************************************************
  FLOW PROCESS FROM NODE   105.00 TO NODE    106.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.948
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4563
  SUBAREA AREA(ACRES) =    9.56   SUBAREA RUNOFF(CFS) =   24.60
  TOTAL AREA(ACRES) =       59.6   TOTAL RUNOFF(CFS) =     134.61
  TC(MIN.) =   10.34

***************************************************************************
  FLOW PROCESS FROM NODE   105.00 TO NODE    106.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.948
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4675
  SUBAREA AREA(ACRES) =   12.76   SUBAREA RUNOFF(CFS) =   32.83
```

```
   TOTAL AREA(ACRES) =       72.4   TOTAL RUNOFF(CFS) =      167.44
   TC(MIN.) =   10.34


******************************************************************************
   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.) =   10.34
  RAINFALL INTENSITY(INCH/HR) =   4.95
  TOTAL STREAM AREA(ACRES) =    72.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    167.44


******************************************************************************
   FLOW PROCESS FROM NODE   1112.00 TO NODE   1113.00 IS CODE =   21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1165.00
  DOWNSTREAM ELEVATION(FEET) =   1145.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =       0.14


******************************************************************************
   FLOW PROCESS FROM NODE   1113.00 TO NODE   1114.00 IS CODE =   51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =   1105.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   315.00   CHANNEL SLOPE =  0.1270
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.292
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.72
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =    9.31
  SUBAREA AREA(ACRES) =      0.57       SUBAREA RUNOFF(CFS) =    1.06
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       1.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.13   FLOW VELOCITY(FEET/SEC.) =   2.16
  LONGEST FLOWPATH FROM NODE   1112.00 TO NODE   1114.00 =    415.00 FEET.


******************************************************************************
   FLOW PROCESS FROM NODE   1114.00 TO NODE   1115.00 IS CODE =   51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =   1015.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   388.00   CHANNEL SLOPE =  0.2320
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.814
  *USER SPECIFIED(SUBAREA):
```

```
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.40
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =   10.78
  SUBAREA AREA(ACRES) =      1.03      SUBAREA RUNOFF(CFS) =    1.74
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       1.7        PEAK FLOW RATE(CFS) =       2.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   4.95
  LONGEST FLOWPATH FROM NODE   1112.00 TO NODE   1115.00 =    803.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1115.00 TO NODE   1116.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1015.00  DOWNSTREAM(FEET) =     880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   432.00   CHANNEL SLOPE = 0.3125
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.554
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.41
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   0.97
  Tc(MIN.) =   11.76
  SUBAREA AREA(ACRES) =      4.13      SUBAREA RUNOFF(CFS) =    6.58
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       5.8        PEAK FLOW RATE(CFS) =       9.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   8.53
  LONGEST FLOWPATH FROM NODE   1112.00 TO NODE   1116.00 =   1235.00 FEET.

****************************************************************************
  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) =    880.00  DOWNSTREAM(FEET) =    670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.00   CHANNEL SLOPE = 0.2263
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.189
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     23.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.53
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =   13.38
  SUBAREA AREA(ACRES) =     18.85      SUBAREA RUNOFF(CFS) =   27.64
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =      24.6        PEAK FLOW RATE(CFS) =      36.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) =  10.94
  LONGEST FLOWPATH FROM NODE   1112.00 TO NODE   1117.00 =   2163.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1117.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   660.00  DOWNSTREAM(FEET) =   635.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.62
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       36.13
  PIPE TRAVEL TIME(MIN.) =   0.09   Tc(MIN.) =   13.47
  LONGEST FLOWPATH FROM NODE   1112.00 TO NODE    106.00 =   2313.00 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.) =   13.47
  RAINFALL INTENSITY(INCH/HR) =   4.17
  TOTAL STREAM AREA(ACRES) =    24.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.13

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc      INTENSITY      AREA
  NUMBER    (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1     167.44    10.34      4.948        72.38
     2      36.13    13.47      4.171        24.64

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)    (MIN.)   (INCH/HOUR)
     1     195.16    10.34      4.948
     2     177.26    13.47      4.171

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     195.16   Tc(MIN.) =   10.34
  TOTAL AREA(ACRES) =        97.0
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    106.00 =   2880.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =   31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   640.00  DOWNSTREAM(FEET) =   615.00
  FLOW LENGTH(FEET) =   385.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.13
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      195.16
  PIPE TRAVEL TIME(MIN.) =   0.23   Tc(MIN.) =   10.56
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    107.00 =   3265.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =   81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.879
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4405
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    2.59
  TOTAL AREA(ACRES) =        97.6  TOTAL RUNOFF(CFS) =      209.77
  TC(MIN.) =   10.56
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE   106.00 TO NODE   107.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.879
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4479
  SUBAREA AREA(ACRES) =   10.08   SUBAREA RUNOFF(CFS) =   25.57
  TOTAL AREA(ACRES) =      107.7   TOTAL RUNOFF(CFS) =      235.34
  TC(MIN.) =   10.56

*******************************************************************************
  FLOW PROCESS FROM NODE   107.00 TO NODE   107.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.56
  RAINFALL INTENSITY(INCH/HR) =  4.88
  TOTAL STREAM AREA(ACRES) =   107.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    235.34

*******************************************************************************
  FLOW PROCESS FROM NODE   1118.00 TO NODE   1119.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    920.00
  DOWNSTREAM ELEVATION(FEET) =   900.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =       0.12

*******************************************************************************
  FLOW PROCESS FROM NODE   1119.00 TO NODE   1120.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    900.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   355.00   CHANNEL SLOPE = 0.2254
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.070
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.69
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =    7.53
  SUBAREA AREA(ACRES) =      2.22       SUBAREA RUNOFF(CFS) =    4.72
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =         2.3       PEAK FLOW RATE(CFS) =       4.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.18   FLOW VELOCITY(FEET/SEC.) =   6.14
  LONGEST FLOWPATH FROM NODE   1118.00 TO NODE   1120.00 =    455.00 FEET.
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE   1120.00 TO NODE   1121.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   820.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  650.00   CHANNEL SLOPE =  0.3000
  CHANNEL BASE(FEET) =   4.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.561
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.88
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.10
  Tc(MIN.) =    8.63
  SUBAREA AREA(ACRES) =    10.27        SUBAREA RUNOFF(CFS) =   19.99
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       12.5        PEAK FLOW RATE(CFS) =     24.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   FLOW VELOCITY(FEET/SEC.) = 11.61
  LONGEST FLOWPATH FROM NODE   1118.00 TO NODE   1121.00 =   1105.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1121.00 TO NODE    107.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   625.00  DOWNSTREAM(FEET) =   605.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 31.85
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.41
  PIPE TRAVEL TIME(MIN.) =   0.03   Tc(MIN.) =    8.66
  LONGEST FLOWPATH FROM NODE   1118.00 TO NODE    107.00 =   1165.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.66
  RAINFALL INTENSITY(INCH/HR) =   5.55
  TOTAL STREAM AREA(ACRES) =   12.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1      235.34    10.56        4.879        107.69
     2       24.41     8.66        5.548         12.54

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1      231.37     8.66        5.548
     2      256.80    10.56        4.879

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =     256.80   Tc(MIN.) =    10.56
  TOTAL AREA(ACRES) =      120.2
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    107.00 =   3265.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =   31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   615.00  DOWNSTREAM(FEET) =   580.00
  FLOW LENGTH(FEET) =   610.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 28.97
  ESTIMATED PIPE DIAMETER(INCH) = 45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      256.80
  PIPE TRAVEL TIME(MIN.) =    0.35    Tc(MIN.) =    10.92
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    108.00 =   3875.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =   81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.777
 *USER SPECIFIED(SUBAREA):
  LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4351
  SUBAREA AREA(ACRES) =    3.70   SUBAREA RUNOFF(CFS) =    6.19
  TOTAL AREA(ACRES) =       123.9   TOTAL RUNOFF(CFS) =     257.58
  TC(MIN.) =   10.92

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =   81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.777
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4379
  SUBAREA AREA(ACRES) =    4.27   SUBAREA RUNOFF(CFS) =   10.61
  TOTAL AREA(ACRES) =       128.2   TOTAL RUNOFF(CFS) =     268.19
  TC(MIN.) =   10.92

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =   81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.777
 *USER SPECIFIED(SUBAREA):
  LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4387
  SUBAREA AREA(ACRES) =    0.91   SUBAREA RUNOFF(CFS) =    2.39
  TOTAL AREA(ACRES) =       129.1   TOTAL RUNOFF(CFS) =     270.58
  TC(MIN.) =   10.92

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =   81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.777
 *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4459
```

```
  SUBAREA AREA(ACRES) =    2.29   SUBAREA RUNOFF(CFS) =    9.30
  TOTAL AREA(ACRES) =      131.4   TOTAL RUNOFF(CFS) =    279.88
  TC(MIN.) =   10.92

*****************************************************************************
  FLOW PROCESS FROM NODE   107.00 TO NODE   108.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.777
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4484
  SUBAREA AREA(ACRES) =    4.56   SUBAREA RUNOFF(CFS) =   11.33
  TOTAL AREA(ACRES) =      136.0   TOTAL RUNOFF(CFS) =    291.21
  TC(MIN.) =   10.92

*****************************************************************************
  FLOW PROCESS FROM NODE   108.00 TO NODE   108.00 IS CODE =  10
-----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   109.00 TO NODE   110.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    706.00
  DOWNSTREAM ELEVATION(FEET) =    704.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =       0.27   TOTAL RUNOFF(CFS) =      0.87

*****************************************************************************
  FLOW PROCESS FROM NODE   110.00 TO NODE   111.00 IS CODE =  62
-----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
=============================================================================
  UPSTREAM ELEVATION(FEET) =  704.00  DOWNSTREAM ELEVATION(FEET) =  682.00
  STREET LENGTH(FEET) =    740.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.28
  STREET FLOW TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =   10.53
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.889
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.568
   SUBAREA AREA(ACRES) =    5.75      SUBAREA RUNOFF(CFS) =   16.02
   TOTAL AREA(ACRES) =       6.0       PEAK FLOW RATE(CFS) =      16.71

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.16
   FLOW VELOCITY(FEET/SEC.) = 4.52   DEPTH*VELOCITY(FT*FT/SEC.) =   1.76
   LONGEST FLOWPATH FROM NODE   109.00 TO NODE   111.00 =    835.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   111.00 TO NODE   111.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =  10.53
   RAINFALL INTENSITY(INCH/HR) =   4.89
   TOTAL STREAM AREA(ACRES) =      6.02
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.71

*******************************************************************************
   FLOW PROCESS FROM NODE  1122.00 TO NODE  1123.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  87
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
   UPSTREAM ELEVATION(FEET) =   950.00
   DOWNSTREAM ELEVATION(FEET) =   940.00
   ELEVATION DIFFERENCE(FEET) =    10.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.108
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.947
   SUBAREA RUNOFF(CFS) =      0.36
   TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.36

*******************************************************************************
   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) =   940.00  DOWNSTREAM(FEET) =    845.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   355.00   CHANNEL SLOPE = 0.2676
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  5.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.902
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  87
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.04
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  3.37
   AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.76
   Tc(MIN.) =    7.86
   SUBAREA AREA(ACRES) =     0.65        SUBAREA RUNOFF(CFS) =    1.34
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       1.65

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =  3.87
   LONGEST FLOWPATH FROM NODE  1122.00 TO NODE  1124.00 =    450.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE  1124.00 TO NODE  1125.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    845.00  DOWNSTREAM(FEET) =     715.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  360.00   CHANNEL SLOPE =  0.3611
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.467
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  87
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.05
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   0.99
  Tc(MIN.) =     8.86
  SUBAREA AREA(ACRES) =      2.79       SUBAREA RUNOFF(CFS) =    5.34
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =         3.6        PEAK FLOW RATE(CFS) =        6.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   7.15
  LONGEST FLOWPATH FROM NODE  1122.00 TO NODE  1125.00 =    810.00 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) =    715.00  DOWNSTREAM(FEET) =    680.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  455.00   CHANNEL SLOPE =  0.0769
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.066
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  87
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.83
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   1.11
  Tc(MIN.) =     9.97
  SUBAREA AREA(ACRES) =       8.89       SUBAREA RUNOFF(CFS) =   15.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        12.5        PEAK FLOW RATE(CFS) =       22.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   7.60
  LONGEST FLOWPATH FROM NODE  1122.00 TO NODE  1126.00 =   1265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  1126.00 TO NODE   111.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  675.00  DOWNSTREAM(FEET) =  670.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 19.72
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.13
  PIPE TRAVEL TIME(MIN.) =  0.04   Tc(MIN.) =   10.01
  LONGEST FLOWPATH FROM NODE  1122.00 TO NODE   111.00 =   1315.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  1126.00 TO NODE   111.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.052
```

```
  *USER SPECIFIED(SUBAREA):
  TURF GOOD COVER RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  87
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4261
  SUBAREA AREA(ACRES) =    2.93   SUBAREA RUNOFF(CFS) =   11.10
  TOTAL AREA(ACRES) =       15.4   TOTAL RUNOFF(CFS) =      33.17
  TC(MIN.) =   10.01

*******************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    111.00 IS CODE =    1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =   5.05
  TOTAL STREAM AREA(ACRES) =   15.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.17

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       16.71     10.53      4.889         6.02
     2       33.17     10.01      5.052        15.41

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       49.05     10.01      5.052
     2       48.80     10.53      4.889

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       49.05   Tc(MIN.) =   10.01
  TOTAL AREA(ACRES) =        21.4
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE    111.00 =    1315.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    111.00 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) =    680.00  DOWNSTREAM(FEET) =   625.00
  FLOW LENGTH(FEET) =   735.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.39
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.05
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   10.58
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE    112.00 =    2050.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =   81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.874
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4736
  SUBAREA AREA(ACRES) =    3.58   SUBAREA RUNOFF(CFS) =    9.07
  TOTAL AREA(ACRES) =        25.0   TOTAL RUNOFF(CFS) =      57.73
  TC(MIN.) =   10.58

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

```
  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.) =   10.58
  RAINFALL INTENSITY(INCH/HR) =   4.87
  TOTAL STREAM AREA(ACRES) =    25.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     57.73

******************************************************************************
  FLOW PROCESS FROM NODE   1127.00 TO NODE   1128.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    785.00
  DOWNSTREAM ELEVATION(FEET) =    770.00
  ELEVATION DIFFERENCE(FEET) =    15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =       0.14

******************************************************************************
  FLOW PROCESS FROM NODE   1128.00 TO NODE   1129.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    770.00  DOWNSTREAM(FEET) =    720.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE = 0.2000
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.918
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.66
  AVERAGE FLOW DEPTH(FEET) =    0.06   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =    7.83
  SUBAREA AREA(ACRES) =      0.62        SUBAREA RUNOFF(CFS) =    1.28
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =         0.7         PEAK FLOW RATE(CFS) =       1.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.08   FLOW VELOCITY(FEET/SEC.) =   3.30
  LONGEST FLOWPATH FROM NODE   1127.00 TO NODE   1129.00 =    350.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   1129.00 TO NODE   1130.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    720.00  DOWNSTREAM(FEET) =    620.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   415.00   CHANNEL SLOPE = 0.2410
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.409
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.89
```

```
    AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.17
    Tc(MIN.) =    9.00
    SUBAREA AREA(ACRES) =      4.49       SUBAREA RUNOFF(CFS) =    8.50
    AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
    TOTAL AREA(ACRES) =        5.2        PEAK FLOW RATE(CFS) =        9.79

    END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) = 0.23   FLOW VELOCITY(FEET/SEC.) =   6.86
    LONGEST FLOWPATH FROM NODE   1127.00 TO NODE   1130.00 =    765.00 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.) =    9.00
  RAINFALL INTENSITY(INCH/HR) =   5.41
  TOTAL STREAM AREA(ACRES) =     5.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.79

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc       INTENSITY      AREA
  NUMBER    (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1      57.73     10.58        4.874        25.01
     2       9.79      9.00        5.409         5.17

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc       INTENSITY
  NUMBER    (CFS)     (MIN.)    (INCH/HOUR)
     1      61.81      9.00        5.409
     2      66.55     10.58        4.874

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       66.55   Tc(MIN.) =    10.58
  TOTAL AREA(ACRES) =         30.2
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE    112.00 =    2050.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    108.00 IS CODE =  31
---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   625.00 DOWNSTREAM(FEET) =   580.00
  FLOW LENGTH(FEET) = 1290.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.19
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       66.55
  PIPE TRAVEL TIME(MIN.) =   1.25    Tc(MIN.) =   11.83
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE    108.00 =    3340.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    108.00 IS CODE =  81
---------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.535
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4617
  SUBAREA AREA(ACRES) =    4.77   SUBAREA RUNOFF(CFS) =   11.25
  TOTAL AREA(ACRES) =        35.0   TOTAL RUNOFF(CFS) =       73.17
  TC(MIN.) =   11.83
```

```
*****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 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        73.17      11.83        4.535       34.95
  LONGEST FLOWPATH FROM NODE   1122.00 TO NODE    108.00 =    3340.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM      RUNOFF      Tc        INTENSITY     AREA
  NUMBER      (CFS)      (MIN.)    (INCH/HOUR)   (ACRE)
     1       291.21      10.92        4.777      135.96
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    108.00 =    3875.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF      Tc        INTENSITY
  NUMBER      (CFS)      (MIN.)    (INCH/HOUR)
     1       358.71      10.92        4.777
     2       349.62      11.83        4.535

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      358.71   Tc(MIN.) =   10.92
  TOTAL AREA(ACRES) =       170.9

*****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  12
-----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    113.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    580.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) =   345.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  38.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 31.63
  ESTIMATED PIPE DIAMETER(INCH) = 51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    358.71
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   11.10
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE    113.00 =    4220.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    113.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.726
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4533
  SUBAREA AREA(ACRES) =    5.73   SUBAREA RUNOFF(CFS) =   14.08
  TOTAL AREA(ACRES) =       176.6   TOTAL RUNOFF(CFS) =     378.46
  TC(MIN.) =   11.10

*****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   11.10
 RAINFALL INTENSITY(INCH/HR) =   4.73
 TOTAL STREAM AREA(ACRES) =   176.64
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    378.46


********************************************************************************
  FLOW PROCESS FROM NODE   114.00 TO NODE    115.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
  UPSTREAM ELEVATION(FEET) =   774.00
  DOWNSTREAM ELEVATION(FEET) =   772.00
  ELEVATION DIFFERENCE(FEET) =    2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =     1.12
  TOTAL AREA(ACRES) =       0.35   TOTAL RUNOFF(CFS) =      1.12


********************************************************************************
  FLOW PROCESS FROM NODE   115.00 TO NODE    116.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) = 772.00  DOWNSTREAM ELEVATION(FEET) = 685.00
  STREET LENGTH(FEET) = 1225.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.63
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.39
  STREET FLOW TRAVEL TIME(MIN.) =   3.99  Tc(MIN.) =   11.35
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.658
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
  SUBAREA AREA(ACRES) =    4.50      SUBAREA RUNOFF(CFS) =  10.90
  TOTAL AREA(ACRES) =       4.8       PEAK FLOW RATE(CFS) =     11.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.42
  FLOW VELOCITY(FEET/SEC.) = 5.85   DEPTH*VELOCITY(FT*FT/SEC.) =  1.84
  LONGEST FLOWPATH FROM NODE   114.00 TO NODE    116.00 =   1320.00 FEET.


********************************************************************************
  FLOW PROCESS FROM NODE   116.00 TO NODE    117.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   685.00  DOWNSTREAM(FEET) =   640.00
  FLOW LENGTH(FEET) =  995.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.56
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.75
  PIPE TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =   12.67
  LONGEST FLOWPATH FROM NODE   114.00 TO NODE   117.00 =   2315.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   116.00 TO NODE   117.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.339
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) = 86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5200
  SUBAREA AREA(ACRES) =    6.26   SUBAREA RUNOFF(CFS) =   14.12
  TOTAL AREA(ACRES) =       11.1   TOTAL RUNOFF(CFS) =      25.07
  TC(MIN.) =   12.67

*****************************************************************************
  FLOW PROCESS FROM NODE   117.00 TO NODE   113.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   640.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) = 1520.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 15.97
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.07
  PIPE TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   14.26
  LONGEST FLOWPATH FROM NODE   114.00 TO NODE   113.00 =   3835.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   117.00 TO NODE   113.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.021
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) = 86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5200
  SUBAREA AREA(ACRES) =    6.89   SUBAREA RUNOFF(CFS) =   14.41
  TOTAL AREA(ACRES) =       18.0   TOTAL RUNOFF(CFS) =      37.64
  TC(MIN.) =   14.26

*****************************************************************************
  FLOW PROCESS FROM NODE   113.00 TO NODE   113.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.26
  RAINFALL INTENSITY(INCH/HR) =   4.02
  TOTAL STREAM AREA(ACRES) =    18.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.64

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       378.46    11.10        4.726        176.64
     2        37.64    14.26        4.021         18.00
```

```
    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      407.76     11.10      4.726
       2      359.62     14.26      4.021

    COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
    PEAK FLOW RATE(CFS) =     407.76   Tc(MIN.) =   11.10
    TOTAL AREA(ACRES) =      194.6
    LONGEST FLOWPATH FROM NODE   1101.00 TO NODE     113.00 =    4220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 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) =    560.00  DOWNSTREAM(FEET) =   495.00
  FLOW LENGTH(FEET) = 1030.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  41.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 33.22
  ESTIMATED PIPE DIAMETER(INCH) = 51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     407.76
  PIPE TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =   11.61
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE     118.00 =    5250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    118.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.590
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4674
  SUBAREA AREA(ACRES) =    6.63   SUBAREA RUNOFF(CFS) =   21.30
  TOTAL AREA(ACRES) =       201.3   TOTAL RUNOFF(CFS) =     431.77
  TC(MIN.) =   11.61

+------------------------------------------------------------------------+
| Discharge at Basin #1                                                  |
|                                                                        |
|                                                                        |
+------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    119.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    495.00  DOWNSTREAM(FEET) =   494.00
  FLOW LENGTH(FEET) =  100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  75.0 INCH PIPE IS  57.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.05
  ESTIMATED PIPE DIAMETER(INCH) = 75.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     431.77
  PIPE TRAVEL TIME(MIN.) =   0.10   Tc(MIN.) =   11.71
  LONGEST FLOWPATH FROM NODE   1101.00 TO NODE     119.00 =    5350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    119.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.565
```

```
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4662
 SUBAREA AREA(ACRES) =    3.73   SUBAREA RUNOFF(CFS) =    6.81
 TOTAL AREA(ACRES) =      205.0   TOTAL RUNOFF(CFS) =     436.26
 TC(MIN.) =   11.71


+-----------------------------------------------------------------------------+
| Discharge at Culvert #6.                                                     |
|                                                                             |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE   1201.00 TO NODE   1202.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1060.00
 DOWNSTREAM ELEVATION(FEET) =   1045.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
 SUBAREA RUNOFF(CFS) =      0.17
 TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =       0.17

*******************************************************************************
  FLOW PROCESS FROM NODE   1202.00 TO NODE   1203.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1045.00  DOWNSTREAM(FEET) =    720.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1098.00   CHANNEL SLOPE =  0.2960
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.409
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
 AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   2.74
 Tc(MIN.) =    9.00
 SUBAREA AREA(ACRES) =      6.17       SUBAREA RUNOFF(CFS) =   11.68
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        6.2        PEAK FLOW RATE(CFS) =      11.81

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.25   FLOW VELOCITY(FEET/SEC.) =   8.63
 LONGEST FLOWPATH FROM NODE   1201.00 TO NODE   1203.00 =    1198.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1203.00 TO NODE    203.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    720.00  DOWNSTREAM(FEET) =   698.00
 FLOW LENGTH(FEET) =    900.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  9.91
 ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.81
 PIPE TRAVEL TIME(MIN.) =  1.51    Tc(MIN.) =   10.52
```

```
        LONGEST FLOWPATH FROM NODE   1201.00 TO NODE    203.00 =    2098.00 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.) =   10.52
   RAINFALL INTENSITY(INCH/HR) =   4.89
   TOTAL STREAM AREA(ACRES) =     6.24
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.81

******************************************************************************
   FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
   UPSTREAM ELEVATION(FEET) =   733.00
   DOWNSTREAM ELEVATION(FEET) =   731.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
   SUBAREA RUNOFF(CFS) =      0.61
   TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.61

******************************************************************************
   FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  62
------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==============================================================================
   UPSTREAM ELEVATION(FEET) =  731.00  DOWNSTREAM ELEVATION(FEET) =  710.00
   STREET LENGTH(FEET) =   930.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.48
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.36
     HALFSTREET FLOOD WIDTH(FEET) =   11.47
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.66
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.30
   STREET FLOW TRAVEL TIME(MIN.) =   4.24   Tc(MIN.) =   11.59
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.595
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
   SUBAREA AREA(ACRES) =    8.16      SUBAREA RUNOFF(CFS) =   19.50
   TOTAL AREA(ACRES) =        8.3       PEAK FLOW RATE(CFS) =      19.95

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =   14.91
```

```
     FLOW VELOCITY(FEET/SEC.) =  4.26   DEPTH*VELOCITY(FT*FT/SEC.) =   1.81
     LONGEST FLOWPATH FROM NODE   201.00 TO NODE    203.00 =  1025.00 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.) =   11.59
   RAINFALL INTENSITY(INCH/HR) =   4.59
   TOTAL STREAM AREA(ACRES) =      8.35
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.95

   ** CONFLUENCE DATA **
   STREAM    RUNOFF       Tc      INTENSITY      AREA
   NUMBER    (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1      11.81      10.52       4.893         6.24
      2      19.95      11.59       4.595         8.35

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

   ** PEAK FLOW RATE TABLE **
   STREAM    RUNOFF       Tc      INTENSITY
   NUMBER    (CFS)      (MIN.)   (INCH/HOUR)
      1      29.91      10.52       4.893
      2      31.04      11.59       4.595

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      31.04   Tc(MIN.) =   11.59
   TOTAL AREA(ACRES) =       14.6
   LONGEST FLOWPATH FROM NODE  1201.00 TO NODE    203.00 =  2098.00 FEET.

******************************************************************************
   FLOW PROCESS FROM NODE   203.00 TO NODE    203.00 IS CODE =  10
------------------------------------------------------------------------------
   >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================


******************************************************************************
   FLOW PROCESS FROM NODE  1204.00 TO NODE   1205.00 IS CODE =  21
------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1335.00
   DOWNSTREAM ELEVATION(FEET) =   1330.00
   ELEVATION DIFFERENCE(FEET) =      5.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.895
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.887
   SUBAREA RUNOFF(CFS) =      0.25
   TOTAL AREA(ACRES) =       0.12   TOTAL RUNOFF(CFS) =      0.25

******************************************************************************
   FLOW PROCESS FROM NODE  1205.00 TO NODE   1206.00 IS CODE =  51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1330.00  DOWNSTREAM(FEET) =    860.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1514.00   CHANNEL SLOPE =  0.3104
   CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.350
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.866
   *USER SPECIFIED(SUBAREA):
```

```
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     15.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.30
 AVERAGE FLOW DEPTH(FEET) =  0.27    TRAVEL TIME(MIN.) =   2.71
 Tc(MIN.) =  10.61
 SUBAREA AREA(ACRES) =     17.48       SUBAREA RUNOFF(CFS) =  29.77
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        17.6        PEAK FLOW RATE(CFS) =      29.97

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41   FLOW VELOCITY(FEET/SEC.) = 11.98
 LONGEST FLOWPATH FROM NODE  1204.00 TO NODE  1206.00 =   1614.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE  1206.00 TO NODE  1207.00 IS CODE =  51
------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    825.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.1400
 CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.701
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     36.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.19
 AVERAGE FLOW DEPTH(FEET) =   0.32    TRAVEL TIME(MIN.) =   0.58
 Tc(MIN.) =  11.19
 SUBAREA AREA(ACRES) =      7.39       SUBAREA RUNOFF(CFS) =  12.16
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        25.0        PEAK FLOW RATE(CFS) =      41.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.35   FLOW VELOCITY(FEET/SEC.) =  7.49
 LONGEST FLOWPATH FROM NODE  1204.00 TO NODE  1207.00 =   1864.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE  1207.00 TO NODE  1207.00 IS CODE =   1
------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.19
 RAINFALL INTENSITY(INCH/HR) =   4.70
 TOTAL STREAM AREA(ACRES) =    24.99
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.12

******************************************************************************
 FLOW PROCESS FROM NODE  1208.00 TO NODE  1209.00 IS CODE =  21
------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1735.00
 DOWNSTREAM ELEVATION(FEET) =   1720.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
 SUBAREA RUNOFF(CFS) =      0.22
 TOTAL AREA(ACRES) =       0.09   TOTAL RUNOFF(CFS) =      0.22

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

```
   FLOW PROCESS FROM NODE   1209.00 TO NODE   1210.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1720.00  DOWNSTREAM(FEET) =   1030.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1858.00   CHANNEL SLOPE = 0.3714
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.477
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.08
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =    8.83
  SUBAREA AREA(ACRES) =    27.20       SUBAREA RUNOFF(CFS) =   52.14
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        27.3       PEAK FLOW RATE(CFS) =      52.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) = 15.04
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE   1210.00 =   1958.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1210.00 TO NODE   1211.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  729.00   CHANNEL SLOPE = 0.2812
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.116
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.35
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =    9.81
  SUBAREA AREA(ACRES) =    10.16       SUBAREA RUNOFF(CFS) =   18.19
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        37.5       PEAK FLOW RATE(CFS) =      67.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) = 12.59
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE   1211.00 =   2687.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1207.00 TO NODE   1207.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   9.81
  RAINFALL INTENSITY(INCH/HR) =  5.12
  TOTAL STREAM AREA(ACRES) =   37.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     67.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       41.12     11.19       4.701        24.99
     2       67.06      9.81       5.116        37.45

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
   CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc     INTENSITY
  NUMBER    (CFS)     (MIN.)  (INCH/HOUR)
     1      103.13     9.81     5.116
     2      102.75    11.19     4.701

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     103.13   Tc(MIN.) =    9.81
  TOTAL AREA(ACRES) =        62.4
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE   1207.00 =    2687.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1207.00 TO NODE   1211.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    765.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   720.00   CHANNEL SLOPE =  0.0833
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =    2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.758
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     118.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.26
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =   10.98
  SUBAREA AREA(ACRES) =    18.43       SUBAREA RUNOFF(CFS) =   30.69
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        80.9        PEAK FLOW RATE(CFS) =    134.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.00   FLOW VELOCITY(FEET/SEC.) = 10.72
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE   1211.00 =    3407.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1211.00 TO NODE   1212.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    765.00  DOWNSTREAM(FEET) =   755.00
  FLOW LENGTH(FEET) =    150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 26.39
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     134.67
  PIPE TRAVEL TIME(MIN.) =   0.09   Tc(MIN.) =   11.08
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE   1212.00 =    3557.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1212.00 TO NODE   1212.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =   2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.08
  RAINFALL INTENSITY(INCH/HR) =   4.73
  TOTAL STREAM AREA(ACRES) =    80.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    134.67

********************************************************************************
  FLOW PROCESS FROM NODE   1213.00 TO NODE   1214.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
```

```
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1050.00
 DOWNSTREAM ELEVATION(FEET) =   1030.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
 SUBAREA RUNOFF(CFS) =      0.14
 TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =      0.14

*****************************************************************************
  FLOW PROCESS FROM NODE   1214.00 TO NODE   1215.00 IS CODE =  51
 ---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    760.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1369.00   CHANNEL SLOPE = 0.1972
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.999
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.84
 AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   3.91
 Tc(MIN.) =   10.17
 SUBAREA AREA(ACRES) =      6.43       SUBAREA RUNOFF(CFS) =   11.25
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        6.5        PEAK FLOW RATE(CFS) =      11.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   FLOW VELOCITY(FEET/SEC.) =   7.37
  LONGEST FLOWPATH FROM NODE   1213.00 TO NODE   1215.00 =   1469.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1215.00 TO NODE   1212.00 IS CODE =  31
 ---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    760.00  DOWNSTREAM(FEET) =   755.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.93
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.35
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   10.30
  LONGEST FLOWPATH FROM NODE   1213.00 TO NODE   1212.00 =   1569.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1212.00 TO NODE   1212.00 IS CODE =   1
 ---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 ===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.30
  RAINFALL INTENSITY(INCH/HR) =   4.96
  TOTAL STREAM AREA(ACRES) =     6.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.35

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

```
    1      134.67     11.08        4.732         80.87
    2       11.35     10.30        4.958          6.49

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER      (CFS)    (MIN.)    (INCH/HOUR)
     1       139.87     10.30       4.958
     2       145.51     11.08       4.732

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     145.51   Tc(MIN.) =    11.08
  TOTAL AREA(ACRES) =        87.4
  LONGEST FLOWPATH FROM NODE  1208.00 TO NODE  1212.00 =    3557.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1212.00 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) =   755.00  DOWNSTREAM(FEET) =   730.00
  FLOW LENGTH(FEET) =  865.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.53
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     145.51
  PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   11.82
  LONGEST FLOWPATH FROM NODE  1208.00 TO NODE    204.00 =    4422.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.82
  RAINFALL INTENSITY(INCH/HR) =   4.54
  TOTAL STREAM AREA(ACRES) =    87.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    145.51

*******************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
  UPSTREAM ELEVATION(FEET) =   795.00
  DOWNSTREAM ELEVATION(FEET) =   793.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =       0.19   TOTAL RUNOFF(CFS) =      0.61

*******************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    204.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
```

```
   UPSTREAM ELEVATION(FEET) =  793.00  DOWNSTREAM ELEVATION(FEET) =  730.00
   STREET LENGTH(FEET) =   885.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =    0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.50
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.31
      HALFSTREET FLOOD WIDTH(FEET) =    9.33
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.81
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.82
   STREET FLOW TRAVEL TIME(MIN.) =   2.54   Tc(MIN.) =    9.89
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.089
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
   SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =   21.65
   TOTAL AREA(ACRES) =         8.4        PEAK FLOW RATE(CFS) =     22.15

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) = 12.34
   FLOW VELOCITY(FEET/SEC.) =  6.75   DEPTH*VELOCITY(FT*FT/SEC.) =   2.52
   LONGEST FLOWPATH FROM NODE   205.00 TO NODE   204.00 =    980.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   204.00 TO NODE   204.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.89
  RAINFALL INTENSITY(INCH/HR) =   5.09
  TOTAL STREAM AREA(ACRES) =     8.37
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.15

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      145.51    11.82       4.539        87.36
     2       22.15     9.89       5.089         8.37

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      151.92     9.89       5.089
     2      165.26    11.82       4.539

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      165.26   Tc(MIN.) =   11.82
  TOTAL AREA(ACRES) =        95.7
  LONGEST FLOWPATH FROM NODE  1208.00 TO NODE    204.00 =   4422.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   204.00 TO NODE   203.00 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) =   710.00
  FLOW LENGTH(FEET) =  795.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.11
  ESTIMATED PIPE DIAMETER(INCH) =  45.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     165.26
  PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =   12.51
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    203.00 =    5217.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    203.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.375
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3703
  SUBAREA AREA(ACRES) =    3.45   SUBAREA RUNOFF(CFS) =    7.85
  TOTAL AREA(ACRES) =        99.2   TOTAL RUNOFF(CFS) =     165.26
  TC(MIN.) =   12.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*******************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 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       165.26    12.51       4.375       99.18
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    203.00 =    5217.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        31.04    11.59       4.595       14.59
  LONGEST FLOWPATH FROM NODE   1201.00 TO NODE    203.00 =    2098.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       184.22    11.59       4.595
     2       194.82    12.51       4.375

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     194.82   Tc(MIN.) =   12.51
  TOTAL AREA(ACRES) =       113.8

*******************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  12
-------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    207.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   710.00  DOWNSTREAM(FEET) =   610.00
  FLOW LENGTH(FEET) = 2880.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.46
  ESTIMATED PIPE DIAMETER(INCH) =  45.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     194.82
```

```
 PIPE TRAVEL TIME(MIN.) =   2.14    Tc(MIN.) =   14.65
 LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    207.00 =   8097.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    203.00 TO NODE    207.00 IS CODE =  81
 --------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.952
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.3845
   SUBAREA AREA(ACRES) =    3.66   SUBAREA RUNOFF(CFS) =    7.52
   TOTAL AREA(ACRES) =       117.4   TOTAL RUNOFF(CFS) =     194.82
   TC(MIN.) =   14.65
   NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
   FLOW PROCESS FROM NODE    207.00 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) =   610.00  DOWNSTREAM(FEET) =   564.00
   FLOW LENGTH(FEET) =   885.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.3 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  26.18
   ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =    194.82
   PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   15.21
   LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    208.00 =   8982.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    207.00 TO NODE    208.00 IS CODE =  81
 --------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.857
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4003
   SUBAREA AREA(ACRES) =   10.94   SUBAREA RUNOFF(CFS) =   24.05
   TOTAL AREA(ACRES) =        128.4   TOTAL RUNOFF(CFS) =     198.19
   TC(MIN.) =   15.21

****************************************************************************
   FLOW PROCESS FROM NODE    208.00 TO NODE    209.00 IS CODE =  31
 --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   564.00  DOWNSTREAM(FEET) =   520.00
   FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.4 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  42.04
   ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =    198.19
   PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   15.31
   LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    209.00 =   9222.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    208.00 TO NODE    209.00 IS CODE =  81
 --------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.841
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .5500
   S.C.S. CURVE NUMBER (AMC II) =  87
```

```
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4012
 SUBAREA AREA(ACRES) =    0.76   SUBAREA RUNOFF(CFS) =    1.61
 TOTAL AREA(ACRES) =       129.1   TOTAL RUNOFF(CFS) =     199.00
 TC(MIN.) =   15.31

******************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    209.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.841
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4122
  SUBAREA AREA(ACRES) =    4.76   SUBAREA RUNOFF(CFS) =   12.98
  TOTAL AREA(ACRES) =       133.9   TOTAL RUNOFF(CFS) =     211.98
  TC(MIN.) =   15.31

******************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    209.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.841
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4116
  SUBAREA AREA(ACRES) =    1.14   SUBAREA RUNOFF(CFS) =    1.53
  TOTAL AREA(ACRES) =       135.0   TOTAL RUNOFF(CFS) =     213.51
  TC(MIN.) =   15.31

+----------------------------------------------------------------------------+
| Discharge at Basin #2.                                                     |
| Then pipe flow towards Culvert #7.                                         |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    210.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    520.00  DOWNSTREAM(FEET) =    502.00
  FLOW LENGTH(FEET) =    715.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  37.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.13
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     213.51
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =   15.90
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    210.00 =    9937.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    210.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.748
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4255
  SUBAREA AREA(ACRES) =    4.41   SUBAREA RUNOFF(CFS) =   14.05
  TOTAL AREA(ACRES) =       139.4   TOTAL RUNOFF(CFS) =     222.40
  TC(MIN.) =   15.90

******************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    210.00 IS CODE =  10
------------------------------------------------------------------------------
```

```
    >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
===========================================================================


+--------------------------------------------------------------------------+
| Save flow fromWQB#2 to be confluenced with additional flows.             |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    795.00
  DOWNSTREAM ELEVATION(FEET) =    793.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =       0.67
  TOTAL AREA(ACRES) =        0.21   TOTAL RUNOFF(CFS) =        0.67

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) =  793.00  DOWNSTREAM ELEVATION(FEET) =  720.00
  STREET LENGTH(FEET) = 1690.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.10
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.32
    HALFSTREET FLOOD WIDTH(FEET) =   9.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   4.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.50
  STREET FLOW TRAVEL TIME(MIN.) =  6.04   Tc(MIN.) =  13.40
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.185
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
  SUBAREA AREA(ACRES) =     8.50       SUBAREA RUNOFF(CFS) =   18.50
  TOTAL AREA(ACRES) =        8.7        PEAK FLOW RATE(CFS) =     18.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) = 12.84
  FLOW VELOCITY(FEET/SEC.) = 5.36   DEPTH*VELOCITY(FT*FT/SEC.) =  2.05
  LONGEST FLOWPATH FROM NODE    301.00 TO NODE    303.00 =   1785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  10
```

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

********************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE   1302.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =  1270.00
  DOWNSTREAM ELEVATION(FEET) =  1250.00
  ELEVATION DIFFERENCE(FEET) =    20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.14

********************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1303.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1250.00  DOWNSTREAM(FEET) =   775.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1588.00   CHANNEL SLOPE = 0.2991
  CHANNEL BASE(FEET) =   5.00   "Z" FACTOR =  2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.421
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.79
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =    8.97
  SUBAREA AREA(ACRES) =     17.91        SUBAREA RUNOFF(CFS) =   33.98
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       18.0        PEAK FLOW RATE(CFS) =      34.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   FLOW VELOCITY(FEET/SEC.) = 12.44
  LONGEST FLOWPATH FROM NODE   1301.00 TO NODE   1303.00 =   1688.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1304.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   775.00  DOWNSTREAM(FEET) =   745.00
  FLOW LENGTH(FEET) =   710.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 15.84
  ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     34.10
  PIPE TRAVEL TIME(MIN.) =   0.75   Tc(MIN.) =    9.72
  LONGEST FLOWPATH FROM NODE   1301.00 TO NODE   1304.00 =   2398.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1304.00 TO NODE   1304.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.72
```

```
  RAINFALL INTENSITY(INCH/HR) =   5.15
  TOTAL STREAM AREA(ACRES) =    17.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.10

****************************************************************************
  FLOW PROCESS FROM NODE   1305.00 TO NODE   1306.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =  1180.00
  DOWNSTREAM ELEVATION(FEET) =  1165.00
  ELEVATION DIFFERENCE(FEET) =    15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE   1306.00 TO NODE   1307.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1165.00  DOWNSTREAM(FEET) =    765.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1356.00   CHANNEL SLOPE = 0.2950
  CHANNEL BASE(FEET) =   5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.215
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     6.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.93
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =    9.53
  SUBAREA AREA(ACRES) =      7.27       SUBAREA RUNOFF(CFS) =  13.27
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        7.3        PEAK FLOW RATE(CFS) =     13.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   FLOW VELOCITY(FEET/SEC.) =   8.76
  LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1307.00 =   1456.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1307.00 TO NODE   1304.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   775.00  DOWNSTREAM(FEET) =   745.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 29.61
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.40
  PIPE TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    9.57
  LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1304.00 =   1526.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1304.00 TO NODE   1304.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
     CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
     TIME OF CONCENTRATION(MIN.) =    9.57
     RAINFALL INTENSITY(INCH/HR) =   5.20
     TOTAL STREAM AREA(ACRES) =      7.34
     PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.40


     ** CONFLUENCE DATA **
     STREAM    RUNOFF     Tc      INTENSITY     AREA
     NUMBER    (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
       1       34.10     9.72       5.149       17.97
       2       13.40     9.57       5.201        7.34

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

     ** PEAK FLOW RATE TABLE **
     STREAM    RUNOFF     Tc      INTENSITY
     NUMBER    (CFS)    (MIN.)   (INCH/HOUR)
       1       46.96     9.57       5.201
       2       47.36     9.72       5.149

     COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
     PEAK FLOW RATE(CFS) =     47.36   Tc(MIN.) =    9.72
     TOTAL AREA(ACRES) =       25.3
     LONGEST FLOWPATH FROM NODE   1301.00 TO NODE   1304.00 =    2398.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1304.00 TO NODE    303.00 IS CODE =  31
---------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   745.00  DOWNSTREAM(FEET) =   720.00
  FLOW LENGTH(FEET) =   545.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.76
  ESTIMATED PIPE DIAMETER(INCH) = 27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      47.36
  PIPE TRAVEL TIME(MIN.) =   0.51   Tc(MIN.) =   10.23
  LONGEST FLOWPATH FROM NODE   1301.00 TO NODE    303.00 =    2943.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 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       47.36    10.23       4.981       25.31
     LONGEST FLOWPATH FROM NODE   1301.00 TO NODE    303.00 =    2943.00 FEET.

     ** MEMORY BANK #  2 CONFLUENCE DATA **
     STREAM    RUNOFF     Tc      INTENSITY     AREA
     NUMBER    (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
       1       18.95    13.40       4.185        8.71
     LONGEST FLOWPATH FROM NODE    301.00 TO NODE    303.00 =    1785.00 FEET.

     ** PEAK FLOW RATE TABLE **
     STREAM    RUNOFF     Tc      INTENSITY
     NUMBER    (CFS)    (MIN.)   (INCH/HOUR)
       1       61.83    10.23       4.981
       2       58.74    13.40       4.185

     COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
     PEAK FLOW RATE(CFS) =     61.83   Tc(MIN.) =   10.23
     TOTAL AREA(ACRES) =       34.0

*****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  12
```

```
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================


********************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   720.00  DOWNSTREAM(FEET) =   700.00
  FLOW LENGTH(FEET) =  465.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.95
  ESTIMATED PIPE DIAMETER(INCH) = 27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     61.83
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE   1301.00 TO NODE    304.00 =   3408.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.850
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4074
  SUBAREA AREA(ACRES) =    4.20   SUBAREA RUNOFF(CFS) =   10.59
  TOTAL AREA(ACRES) =        38.2   TOTAL RUNOFF(CFS) =      75.53
  TC(MIN.) =   10.66

********************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  10
--------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   1308.00 TO NODE   1309.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1575.00
  DOWNSTREAM ELEVATION(FEET) =   1545.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

********************************************************************************
  FLOW PROCESS FROM NODE   1309.00 TO NODE   1310.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1545.00  DOWNSTREAM(FEET) =   1010.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1363.00   CHANNEL SLOPE =  0.3925
  CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.647
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.55
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =    8.42
  SUBAREA AREA(ACRES) =    17.48       SUBAREA RUNOFF(CFS) =   34.55
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       17.6       PEAK FLOW RATE(CFS) =      34.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   FLOW VELOCITY(FEET/SEC.) = 13.30
  LONGEST FLOWPATH FROM NODE   1308.00 TO NODE   1310.00 =   1463.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1310.00 TO NODE   1311.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1010.00  DOWNSTREAM(FEET) =    740.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1004.00   CHANNEL SLOPE = 0.2689
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.179
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.83
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   1.21
  Tc(MIN.) =    9.63
  SUBAREA AREA(ACRES) =    20.97       SUBAREA RUNOFF(CFS) =   38.01
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       38.5       PEAK FLOW RATE(CFS) =      69.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.72   FLOW VELOCITY(FEET/SEC.) = 15.02
  LONGEST FLOWPATH FROM NODE   1308.00 TO NODE   1311.00 =   2467.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1311.00 TO NODE   1312.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =   705.00
  FLOW LENGTH(FEET) =    760.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 19.48
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     69.87
  PIPE TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =  10.28
  LONGEST FLOWPATH FROM NODE   1308.00 TO NODE   1312.00 =   3227.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1312.00 TO NODE   1312.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.28
  RAINFALL INTENSITY(INCH/HR) =   4.97
  TOTAL STREAM AREA(ACRES) =   38.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     69.87

*******************************************************************************
  FLOW PROCESS FROM NODE   1313.00 TO NODE   1314.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1340.00
 DOWNSTREAM ELEVATION(FEET) =   1320.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =      0.12

*******************************************************************************
  FLOW PROCESS FROM NODE   1314.00 TO NODE   1315.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1320.00  DOWNSTREAM(FEET) =     730.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2035.00   CHANNEL SLOPE =  0.2899
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   5.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.046
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.02
 AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   3.76
 Tc(MIN.) =   10.03
 SUBAREA AREA(ACRES) =    19.60       SUBAREA RUNOFF(CFS) =   34.62
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        19.6        PEAK FLOW RATE(CFS) =     34.70

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) =  10.97
 LONGEST FLOWPATH FROM NODE   1313.00 TO NODE   1315.00 =    2135.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1315.00 TO NODE   1312.00 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) =   705.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  31.12
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     34.70
 PIPE TRAVEL TIME(MIN.) =   0.05   Tc(MIN.) =   10.08
 LONGEST FLOWPATH FROM NODE   1313.00 TO NODE   1312.00 =    2235.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1312.00 TO NODE   1312.00 IS CODE =   1
-------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.08
 RAINFALL INTENSITY(INCH/HR) =   5.03
 TOTAL STREAM AREA(ACRES) =    19.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.70

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY      AREA
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)     (ACRE)
    1       69.87     10.28       4.965        38.55
    2       34.70     10.08       5.029        19.65
```

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF     Tc       INTENSITY
   NUMBER     (CFS)    (MIN.)    (INCH/HOUR)
      1       103.21    10.08       5.029
      2       104.14    10.28       4.965

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     104.14   Tc(MIN.) =   10.28
   TOTAL AREA(ACRES) =       58.2
   LONGEST FLOWPATH FROM NODE  1308.00 TO NODE  1312.00 =    3227.00 FEET.

*****************************************************************************
   FLOW PROCESS FROM NODE   1312.00 TO NODE    304.00 IS CODE =  31
-----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   705.00  DOWNSTREAM(FEET) =   700.00
   FLOW LENGTH(FEET) =    205.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  39.0 INCH PIPE IS   27.1 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 16.94
   ESTIMATED PIPE DIAMETER(INCH) = 39.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     104.14
   PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   10.48
   LONGEST FLOWPATH FROM NODE  1308.00 TO NODE    304.00 =    3432.00 FEET.

*****************************************************************************
   FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 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       104.14    10.48       4.903        58.20
   LONGEST FLOWPATH FROM NODE  1308.00 TO NODE    304.00 =    3432.00 FEET.

   ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM     RUNOFF     Tc       INTENSITY      AREA
   NUMBER     (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1        75.53    10.66       4.850        38.22
   LONGEST FLOWPATH FROM NODE  1301.00 TO NODE    304.00 =    3408.00 FEET.

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF     Tc       INTENSITY
   NUMBER     (CFS)    (MIN.)    (INCH/HOUR)
      1       178.40    10.48       4.903
      2       178.54    10.66       4.850

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     178.54   Tc(MIN.) =   10.66
   TOTAL AREA(ACRES) =       96.4

*****************************************************************************
   FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  12
-----------------------------------------------------------------------------
   >>>>>CLEAR MEMORY BANK # 2 <<<<<
=============================================================================

*****************************************************************************
   FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  31
-----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   700.00  DOWNSTREAM(FEET) =   690.00
```

```
 FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 24.73
 ESTIMATED PIPE DIAMETER(INCH) = 39.00     NUMBER OF PIPES =    1
 PIPE-FLOW(CFS) =     178.54
 PIPE TRAVEL TIME(MIN.) =   0.13   Tc(MIN.) =   10.80
 LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    305.00 =   3632.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.811
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3804
  SUBAREA AREA(ACRES) =    5.25   SUBAREA RUNOFF(CFS) =   13.13
  TOTAL AREA(ACRES) =       101.7   TOTAL RUNOFF(CFS) =      186.05
  TC(MIN.) =   10.80

********************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    306.00 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) =   635.00
  FLOW LENGTH(FEET) =  1015.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 25.74
  ESTIMATED PIPE DIAMETER(INCH) = 39.00     NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =     186.05
  PIPE TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =   11.45
  LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    306.00 =   4647.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    306.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.631
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  85
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3871
  SUBAREA AREA(ACRES) =    6.62   SUBAREA RUNOFF(CFS) =   15.02
  TOTAL AREA(ACRES) =       108.3   TOTAL RUNOFF(CFS) =      194.12
  TC(MIN.) =   11.45

********************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    306.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.45
  RAINFALL INTENSITY(INCH/HR) =  4.63
  TOTAL STREAM AREA(ACRES) =   108.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    194.12

********************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    309.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
```

```
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =   724.00
   DOWNSTREAM ELEVATION(FEET) =   722.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
   SUBAREA RUNOFF(CFS) =       0.67
   TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =       0.67

*******************************************************************************
   FLOW PROCESS FROM NODE    308.00 TO NODE    309.00 IS CODE =  62
-------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
   UPSTREAM ELEVATION(FEET) = 722.00  DOWNSTREAM ELEVATION(FEET) = 710.00
   STREET LENGTH(FEET) =   850.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.58
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.40
     HALFSTREET FLOOD WIDTH(FEET) =   13.66
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.17
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.27
   STREET FLOW TRAVEL TIME(MIN.) =   4.47   Tc(MIN.) =   11.82
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.537
   RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  85
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.491
   SUBAREA AREA(ACRES) =   10.51      SUBAREA RUNOFF(CFS) =   23.36
   TOTAL AREA(ACRES) =        10.7       PEAK FLOW RATE(CFS) =      23.86

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.59
   FLOW VELOCITY(FEET/SEC.) =  3.71   DEPTH*VELOCITY(FT*FT/SEC.) =  1.77
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  850.0 FT WITH ELEVATION-DROP =  12.0 FT, IS   28.8 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    309.00
   LONGEST FLOWPATH FROM NODE    307.00 TO NODE    309.00 =    945.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE    308.00 TO NODE    309.00 IS CODE =  81
-------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.537
   *USER SPECIFIED(SUBAREA):
   TURF GOOD COVER RUNOFF COEFFICIENT = .5500
   S.C.S. CURVE NUMBER (AMC II) =  85
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4986
   SUBAREA AREA(ACRES) =    1.67   SUBAREA RUNOFF(CFS) =    4.17
   TOTAL AREA(ACRES) =        12.4   TOTAL RUNOFF(CFS) =      28.03
   TC(MIN.) =   11.82

*******************************************************************************
   FLOW PROCESS FROM NODE    309.00 TO NODE    306.00 IS CODE =  31
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   710.00  DOWNSTREAM(FEET) =   635.00
  FLOW LENGTH(FEET) = 1175.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.65
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      28.03
  PIPE TRAVEL TIME(MIN.) =   1.11    Tc(MIN.) =   12.93
  LONGEST FLOWPATH FROM NODE   307.00 TO NODE   306.00 =   2120.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   309.00 TO NODE   306.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.282
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5091
  SUBAREA AREA(ACRES) =   12.04   SUBAREA RUNOFF(CFS) =   26.81
  TOTAL AREA(ACRES) =        24.4   TOTAL RUNOFF(CFS) =      53.26
  TC(MIN.) =   12.93

*******************************************************************************
  FLOW PROCESS FROM NODE   306.00 TO NODE   306.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.93
  RAINFALL INTENSITY(INCH/HR) =   4.28
  TOTAL STREAM AREA(ACRES) =   24.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     53.26

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY       AREA
  NUMBER     (CFS)      (MIN.)    (INCH/HOUR)     (ACRE)
     1      194.12     11.45        4.631         108.29
     2       53.26     12.93        4.282          24.43

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)      (MIN.)    (INCH/HOUR)
     1      241.27     11.45        4.631
     2      232.72     12.93        4.282

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      241.27   Tc(MIN.) =   11.45
  TOTAL AREA(ACRES) =        132.7
  LONGEST FLOWPATH FROM NODE  1308.00 TO NODE   306.00 =   4647.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   306.00 TO NODE   310.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   635.00  DOWNSTREAM(FEET) =   610.00
  FLOW LENGTH(FEET) =  295.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 29.31
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
```

```
   PIPE-FLOW(CFS) =     241.27
   PIPE TRAVEL TIME(MIN.) =   0.17   Tc(MIN.) =   11.62
   LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    310.00 =   4942.00 FEET.

******************************************************************************
   FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 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.) =   11.62
   RAINFALL INTENSITY(INCH/HR) =   4.59
   TOTAL STREAM AREA(ACRES) =   132.72
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    241.27

******************************************************************************
   FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =   21
------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) = 86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =    668.00
   DOWNSTREAM ELEVATION(FEET) =    666.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
   SUBAREA RUNOFF(CFS) =      0.45
   TOTAL AREA(ACRES) =       0.14   TOTAL RUNOFF(CFS) =       0.45

******************************************************************************
   FLOW PROCESS FROM NODE    312.00 TO NODE    313.00 IS CODE =   62
------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==============================================================================
   UPSTREAM ELEVATION(FEET) =  666.00  DOWNSTREAM ELEVATION(FEET) =  625.00
   STREET LENGTH(FEET) =   740.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.37
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.29
      HALFSTREET FLOOD WIDTH(FEET) =   8.10
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.76
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.37
   STREET FLOW TRAVEL TIME(MIN.) =   2.59   Tc(MIN.) =   9.95
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.071
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) = 87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.569
   SUBAREA AREA(ACRES) =    4.77       SUBAREA RUNOFF(CFS) =   13.79
   TOTAL AREA(ACRES) =        4.9        PEAK FLOW RATE(CFS) =       14.16
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.81
  FLOW VELOCITY(FEET/SEC.) = 5.50   DEPTH*VELOCITY(FT*FT/SEC.) =  1.88
  LONGEST FLOWPATH FROM NODE   311.00 TO NODE   313.00 =   835.00 FEET.


******************************************************************************
   FLOW PROCESS FROM NODE   313.00 TO NODE   310.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   625.00 DOWNSTREAM(FEET) =   620.00
  FLOW LENGTH(FEET) =   345.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.51
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       14.16
  PIPE TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   10.63
  LONGEST FLOWPATH FROM NODE   311.00 TO NODE   310.00 =   1180.00 FEET.


******************************************************************************
   FLOW PROCESS FROM NODE   313.00 TO NODE   310.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.861
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5425
  SUBAREA AREA(ACRES) =    5.69   SUBAREA RUNOFF(CFS) =   14.38
  TOTAL AREA(ACRES) =       10.6   TOTAL RUNOFF(CFS) =      27.95
  TC(MIN.) =   10.63


******************************************************************************
   FLOW PROCESS FROM NODE   310.00 TO NODE   310.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.63
  RAINFALL INTENSITY(INCH/HR) =   4.86
  TOTAL STREAM AREA(ACRES) =    10.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     27.95


******************************************************************************
   FLOW PROCESS FROM NODE   314.00 TO NODE   315.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    658.00
  DOWNSTREAM ELEVATION(FEET) =    656.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =       0.15   TOTAL RUNOFF(CFS) =      0.48


******************************************************************************
   FLOW PROCESS FROM NODE   315.00 TO NODE   316.00 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  656.00  DOWNSTREAM ELEVATION(FEET) =  628.00
  STREET LENGTH(FEET) =   765.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =     9.25
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.27
  STREET FLOW TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =   10.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.906
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =     5.81       SUBAREA RUNOFF(CFS) =   14.82
  TOTAL AREA(ACRES) =         6.0         PEAK FLOW RATE(CFS) =      15.20

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.16
  FLOW VELOCITY(FEET/SEC.) =  4.76   DEPTH*VELOCITY(FT*FT/SEC.) =   1.76
  LONGEST FLOWPATH FROM NODE   314.00 TO NODE   316.00 =    860.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   316.00 TO NODE   310.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   628.00  DOWNSTREAM(FEET) =   620.00
  FLOW LENGTH(FEET) =   310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 10.57
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =      15.20
  PIPE TRAVEL TIME(MIN.) =   0.49   Tc(MIN.) =   10.96
  LONGEST FLOWPATH FROM NODE   314.00 TO NODE   310.00 =   1170.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   316.00 TO NODE   310.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.763
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5200
  SUBAREA AREA(ACRES) =    7.89    SUBAREA RUNOFF(CFS) =   19.54
  TOTAL AREA(ACRES) =        13.9   TOTAL RUNOFF(CFS) =       34.31
  TC(MIN.) =   10.96

********************************************************************************
  FLOW PROCESS FROM NODE   310.00 TO NODE   310.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
```

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
TIME OF CONCENTRATION(MIN.) =   10.96
RAINFALL INTENSITY(INCH/HR) =   4.76
TOTAL STREAM AREA(ACRES) =   13.85
PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.31

 ** CONFLUENCE DATA **
STREAM    RUNOFF     Tc      INTENSITY    AREA
NUMBER    (CFS)    (MIN.)   (INCH/HOUR)  (ACRE)
   1     241.27    11.62       4.588     132.72
   2      27.95    10.63       4.861      10.60
   3      34.31    10.96       4.763      13.85

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     288.94    10.63       4.861
   2     294.08    10.96       4.763
   3     300.70    11.62       4.588

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =     300.70   Tc(MIN.) =    11.62
TOTAL AREA(ACRES) =       157.2
LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    310.00 =    4942.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE    310.00 TO NODE    317.00 IS CODE =  31
---------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   620.00  DOWNSTREAM(FEET) =   605.00
 FLOW LENGTH(FEET) =   390.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  39.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.85
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     300.70
 PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   11.87
 LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    317.00 =    5332.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE    310.00 TO NODE    317.00 IS CODE =  81
---------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.525
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4329
 SUBAREA AREA(ACRES) =    2.01   SUBAREA RUNOFF(CFS) =    7.28
 TOTAL AREA(ACRES) =       159.2   TOTAL RUNOFF(CFS) =     311.84
 TC(MIN.) =   11.87

*****************************************************************************
 FLOW PROCESS FROM NODE    317.00 TO NODE    317.00 IS CODE =  10
---------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
===========================================================================

*****************************************************************************
 FLOW PROCESS FROM NODE    318.00 TO NODE    319.00 IS CODE =  21
---------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  86
```

```
   INITIAL SUBAREA FLOW-LENGTH(FEET) =      95.00
   UPSTREAM ELEVATION(FEET) =    850.00
   DOWNSTREAM ELEVATION(FEET) =    848.00
   ELEVATION DIFFERENCE(FEET) =      2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
   SUBAREA RUNOFF(CFS) =      0.77
   TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.77

*******************************************************************************
  FLOW PROCESS FROM NODE    319.00 TO NODE    320.00 IS CODE = 62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) = 848.00  DOWNSTREAM ELEVATION(FEET) = 812.00
  STREET LENGTH(FEET) =   770.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.38
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.26
  STREET FLOW TRAVEL TIME(MIN.) =  2.93   Tc(MIN.) =   10.28
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.964
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  87
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.567
  SUBAREA AREA(ACRES) =    4.16       SUBAREA RUNOFF(CFS) =   11.77
  TOTAL AREA(ACRES) =        4.4       PEAK FLOW RATE(CFS) =      12.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) = 10.56
  FLOW VELOCITY(FEET/SEC.) = 5.02   DEPTH*VELOCITY(FT*FT/SEC.) =  1.69
  LONGEST FLOWPATH FROM NODE    318.00 TO NODE    320.00 =     865.00 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) =   812.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) = 1795.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 15.68
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.39
  PIPE TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =   12.19
  LONGEST FLOWPATH FROM NODE    318.00 TO NODE    321.00 =   2660.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    321.00 IS CODE = 81
-------------------------------------------------------------------------------
```

```
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.448
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5693
   SUBAREA AREA(ACRES) =   12.74   SUBAREA RUNOFF(CFS) =   32.30
   TOTAL AREA(ACRES) =        17.1  TOTAL RUNOFF(CFS) =       43.40
   TC(MIN.) =   12.19

********************************************************************************
   FLOW PROCESS FROM NODE    321.00 TO NODE    322.00 IS CODE =  31
--------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   670.00  DOWNSTREAM(FEET) =   637.00
   FLOW LENGTH(FEET) =  595.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.8 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 18.50
   ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     43.40
   PIPE TRAVEL TIME(MIN.) =   0.54   Tc(MIN.) =   12.73
   LONGEST FLOWPATH FROM NODE    318.00 TO NODE    322.00 =   3255.00 FEET.

********************************************************************************
   FLOW PROCESS FROM NODE    321.00 TO NODE    322.00 IS CODE =  81
--------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.326
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5600
   SUBAREA AREA(ACRES) =    4.00   SUBAREA RUNOFF(CFS) =    9.00
   TOTAL AREA(ACRES) =        21.1  TOTAL RUNOFF(CFS) =       51.21
   TC(MIN.) =   12.73

********************************************************************************
   FLOW PROCESS FROM NODE    321.00 TO NODE    322.00 IS CODE =  81
--------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.326
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5547
   SUBAREA AREA(ACRES) =    3.19   SUBAREA RUNOFF(CFS) =    7.18
   TOTAL AREA(ACRES) =        24.3  TOTAL RUNOFF(CFS) =       58.39
   TC(MIN.) =   12.73

********************************************************************************
   FLOW PROCESS FROM NODE    322.00 TO NODE    323.00 IS CODE =  31
--------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   637.00  DOWNSTREAM(FEET) =   633.00
   FLOW LENGTH(FEET) =  575.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.1 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  9.11
   ESTIMATED PIPE DIAMETER(INCH) = 39.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     58.39
   PIPE TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =   13.78
   LONGEST FLOWPATH FROM NODE    318.00 TO NODE    323.00 =   3830.00 FEET.

********************************************************************************
   FLOW PROCESS FROM NODE    322.00 TO NODE    323.00 IS CODE =  81
```

```
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.110
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5450
  SUBAREA AREA(ACRES) =    2.78   SUBAREA RUNOFF(CFS) =    5.26
  TOTAL AREA(ACRES) =        27.1   TOTAL RUNOFF(CFS) =       60.73
  TC(MIN.) =   13.78

********************************************************************************
  FLOW PROCESS FROM NODE   323.00 TO NODE   323.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.78
  RAINFALL INTENSITY(INCH/HR) =   4.11
  TOTAL STREAM AREA(ACRES) =    27.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      60.73

********************************************************************************
  FLOW PROCESS FROM NODE   324.00 TO NODE   325.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    658.00
  DOWNSTREAM ELEVATION(FEET) =    656.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   6.161
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =        0.25   TOTAL RUNOFF(CFS) =       0.80

********************************************************************************
  FLOW PROCESS FROM NODE   324.00 TO NODE   325.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  656.00  DOWNSTREAM ELEVATION(FEET) =  643.00
  STREET LENGTH(FEET) =   475.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.03
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.30
     HALFSTREET FLOOD WIDTH(FEET) =    8.68
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.46
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
  STREET FLOW TRAVEL TIME(MIN.) =   2.29   Tc(MIN.) =    9.65
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.173
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.567
   SUBAREA AREA(ACRES) =    3.54      SUBAREA RUNOFF(CFS) =   10.44
   TOTAL AREA(ACRES) =        3.8       PEAK FLOW RATE(CFS) =      11.11

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.30
   FLOW VELOCITY(FEET/SEC.) = 3.98   DEPTH*VELOCITY(FT*FT/SEC.) =   1.40
   LONGEST FLOWPATH FROM NODE   324.00 TO NODE   325.00 =    570.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   323.00 TO NODE   323.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   9.65
   RAINFALL INTENSITY(INCH/HR) =   5.17
   TOTAL STREAM AREA(ACRES) =      3.79
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.11

   ** CONFLUENCE DATA **
   STREAM     RUNOFF       Tc       INTENSITY      AREA
   NUMBER     (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1       60.73     13.78        4.110        27.11
      2       11.11      9.65        5.173         3.79

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF       Tc       INTENSITY
   NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
      1       53.63      9.65        5.173
      2       69.56     13.78        4.110

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      69.56   Tc(MIN.) =   13.78
   TOTAL AREA(ACRES) =        30.9
   LONGEST FLOWPATH FROM NODE   318.00 TO NODE   323.00 =   3830.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   323.00 TO NODE   317.00 IS CODE =  31
----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   643.00  DOWNSTREAM(FEET) =   605.00
   FLOW LENGTH(FEET) = 1085.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.9 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 17.31
   ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      69.56
   PIPE TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =   14.82
   LONGEST FLOWPATH FROM NODE   318.00 TO NODE   317.00 =   4915.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   323.00 TO NODE   317.00 IS CODE =  81
----------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.921
   *USER SPECIFIED(SUBAREA):
   STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8000
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5700
```

```
 SUBAREA AREA(ACRES) =    3.00   SUBAREA RUNOFF(CFS) =    9.41
 TOTAL AREA(ACRES) =       33.9   TOTAL RUNOFF(CFS) =       75.77
 TC(MIN.) =   14.82

********************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    317.00 IS CODE =    1
--------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.82
 RAINFALL INTENSITY(INCH/HR) =   3.92
 TOTAL STREAM AREA(ACRES) =   33.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      75.77

********************************************************************************
  FLOW PROCESS FROM NODE    326.00 TO NODE    327.00 IS CODE =   21
--------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) = 87
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    643.00
 DOWNSTREAM ELEVATION(FEET) =    640.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.361
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.275
 SUBAREA RUNOFF(CFS) =      1.14
 TOTAL AREA(ACRES) =       0.62   TOTAL RUNOFF(CFS) =       1.14

********************************************************************************
  FLOW PROCESS FROM NODE    327.00 TO NODE    328.00 IS CODE =   51
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    640.00  DOWNSTREAM(FEET) =    625.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   740.00   CHANNEL SLOPE =  0.0203
 CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.224
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  87
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.15
 AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  10.72
 Tc(MIN.) =   20.08
 SUBAREA AREA(ACRES) =     7.50       SUBAREA RUNOFF(CFS) =    8.46
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        8.1        PEAK FLOW RATE(CFS) =       9.16

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.37
 LONGEST FLOWPATH FROM NODE    326.00 TO NODE    328.00 =     840.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    328.00 TO NODE    317.00 IS CODE =   31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   625.00  DOWNSTREAM(FEET) =   605.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.24
 ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
```

```
    PIPE-FLOW(CFS) =       9.16
    PIPE TRAVEL TIME(MIN.) =   0.08   Tc(MIN.) =   20.16
    LONGEST FLOWPATH FROM NODE   326.00 TO NODE   317.00 =    940.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE   328.00 TO NODE   317.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.215
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.3765
   SUBAREA AREA(ACRES) =   1.50   SUBAREA RUNOFF(CFS) =   2.51
   TOTAL AREA(ACRES) =        9.6   TOTAL RUNOFF(CFS) =      11.65
   TC(MIN.) =   20.16


*******************************************************************************
  FLOW PROCESS FROM NODE   317.00 TO NODE   317.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.16
  RAINFALL INTENSITY(INCH/HR) =   3.22
  TOTAL STREAM AREA(ACRES) =     9.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.65

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       75.77     14.82       3.921        33.90
     2       11.65     20.16       3.215         9.62

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       84.33     14.82       3.921
     2       73.78     20.16       3.215

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.33   Tc(MIN.) =   14.82
  TOTAL AREA(ACRES) =       43.5
  LONGEST FLOWPATH FROM NODE   318.00 TO NODE   317.00 =   4915.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE   317.00 TO NODE   317.00 IS CODE =  11
-------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
===============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       84.33     14.82       3.921        43.52
  LONGEST FLOWPATH FROM NODE   318.00 TO NODE   317.00 =   4915.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      311.84     11.87       4.525       159.18
  LONGEST FLOWPATH FROM NODE  1308.00 TO NODE   317.00 =   5332.00 FEET.

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

```
    NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
       1      379.37     11.87       4.525
       2      354.55     14.82       3.921


  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     379.37   Tc(MIN.) =    11.87
  TOTAL AREA(ACRES) =       202.7

*******************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    317.00 IS CODE =  12
-------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
===============================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    329.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   605.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) =  1145.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  46.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.47
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =      379.37
  PIPE TRAVEL TIME(MIN.) =   0.78    Tc(MIN.) =   12.65
  LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    329.00 =    6477.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    329.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.343
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4548
  SUBAREA AREA(ACRES) =    5.09   SUBAREA RUNOFF(CFS) =   11.50
  TOTAL AREA(ACRES) =       207.8   TOTAL RUNOFF(CFS) =     410.45
  TC(MIN.) =   12.65

*******************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    329.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.343
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4636
  SUBAREA AREA(ACRES) =    6.34   SUBAREA RUNOFF(CFS) =   20.65
  TOTAL AREA(ACRES) =       214.1   TOTAL RUNOFF(CFS) =     431.10
  TC(MIN.) =   12.65

*******************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    329.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.343
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4646
  SUBAREA AREA(ACRES) =    4.22   SUBAREA RUNOFF(CFS) =    9.53
  TOTAL AREA(ACRES) =       218.4   TOTAL RUNOFF(CFS) =     440.63
  TC(MIN.) =   12.65
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE    329.00 TO NODE    329.00 IS CODE =   1
-------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.65
 RAINFALL INTENSITY(INCH/HR) =   4.34
 TOTAL STREAM AREA(ACRES) =   218.35
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    440.63

*******************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    331.00 IS CODE =  21
-------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
 UPSTREAM ELEVATION(FEET) =   668.00
 DOWNSTREAM ELEVATION(FEET) =   666.00
 ELEVATION DIFFERENCE(FEET) =    2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
 SUBAREA RUNOFF(CFS) =      0.45
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.45

*******************************************************************************
  FLOW PROCESS FROM NODE    331.00 TO NODE    332.00 IS CODE =  62
-------------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
 UPSTREAM ELEVATION(FEET) = 666.00  DOWNSTREAM ELEVATION(FEET) = 620.00
 STREET LENGTH(FEET) = 1150.00   CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0350

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.06
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.33
   HALFSTREET FLOOD WIDTH(FEET) =   10.40
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
 STREET FLOW TRAVEL TIME(MIN.) =   4.16   Tc(MIN.) =   11.52
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.615
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
 SUBAREA AREA(ACRES) =    8.72      SUBAREA RUNOFF(CFS) =   20.92
 TOTAL AREA(ACRES) =       8.9       PEAK FLOW RATE(CFS) =     21.26

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) = 13.66
 FLOW VELOCITY(FEET/SEC.) = 5.36   DEPTH*VELOCITY(FT*FT/SEC.) =  2.14
 LONGEST FLOWPATH FROM NODE   330.00 TO NODE   332.00 =   1245.00 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) =   620.00  DOWNSTREAM(FEET) =   610.00
  FLOW LENGTH(FEET) =   310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.71
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     21.26
  PIPE TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =   11.92
  LONGEST FLOWPATH FROM NODE    330.00 TO NODE    333.00 =   1555.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    332.00 TO NODE    333.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.513
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5200
  SUBAREA AREA(ACRES) =    9.81   SUBAREA RUNOFF(CFS) =   23.02
  TOTAL AREA(ACRES) =       18.7   TOTAL RUNOFF(CFS) =      43.81
  TC(MIN.) =   11.92

*******************************************************************************
  FLOW PROCESS FROM NODE    332.00 TO NODE    333.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.513
  *USER SPECIFIED(SUBAREA):
  TURF GOOD COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5210
  SUBAREA AREA(ACRES) =    0.64   SUBAREA RUNOFF(CFS) =    1.59
  TOTAL AREA(ACRES) =       19.3   TOTAL RUNOFF(CFS) =      45.40
  TC(MIN.) =   11.92

*******************************************************************************
  FLOW PROCESS FROM NODE    333.00 TO NODE    334.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   610.00  DOWNSTREAM(FEET) =   580.00
  FLOW LENGTH(FEET) =   505.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 19.18
  ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     45.40
  PIPE TRAVEL TIME(MIN.) =   0.44   Tc(MIN.) =   12.36
  LONGEST FLOWPATH FROM NODE    330.00 TO NODE    334.00 =   2060.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    333.00 TO NODE    334.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.409
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5207
  SUBAREA AREA(ACRES) =    9.51   SUBAREA RUNOFF(CFS) =   21.80
  TOTAL AREA(ACRES) =       28.8   TOTAL RUNOFF(CFS) =      66.15
```

```
   TC(MIN.) =   12.36

*******************************************************************************
  FLOW PROCESS FROM NODE   334.00 TO NODE    329.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   580.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) =   610.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 16.72
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.15
  PIPE TRAVEL TIME(MIN.) =   0.61   Tc(MIN.) =   12.97
  LONGEST FLOWPATH FROM NODE   330.00 TO NODE    329.00 =   2670.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   334.00 TO NODE    329.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.274
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5205
  SUBAREA AREA(ACRES) =    8.24   SUBAREA RUNOFF(CFS) =   18.31
  TOTAL AREA(ACRES) =        37.1   TOTAL RUNOFF(CFS) =      82.45
  TC(MIN.) =   12.97

*******************************************************************************
  FLOW PROCESS FROM NODE   329.00 TO NODE    329.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.97
  RAINFALL INTENSITY(INCH/HR) =   4.27
  TOTAL STREAM AREA(ACRES) =    37.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     82.45

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      440.63    12.65       4.343       218.35
     2       82.45    12.97       4.274        37.06

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      521.06    12.65       4.343
     2      516.09    12.97       4.274

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     521.06   Tc(MIN.) =   12.65
  TOTAL AREA(ACRES) =       255.4
  LONGEST FLOWPATH FROM NODE  1308.00 TO NODE    329.00 =   6477.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   329.00 TO NODE    335.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   560.00  DOWNSTREAM(FEET) =   545.00
```

```
   FLOW LENGTH(FEET) =   475.00   MANNING'S N =  0.015
   DEPTH OF FLOW IN  69.0 INCH PIPE IS  52.1 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 24.79
   ESTIMATED PIPE DIAMETER(INCH) = 69.00     NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     521.06
   PIPE TRAVEL TIME(MIN.) =   0.32   Tc(MIN.) =   12.97
   LONGEST FLOWPATH FROM NODE  1308.00 TO NODE    335.00 =   6952.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   329.00 TO NODE    335.00 IS CODE =  81
-------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.274
   *USER SPECIFIED(SUBAREA):
   STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7000
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4759
   SUBAREA AREA(ACRES) =    3.53   SUBAREA RUNOFF(CFS) =   10.56
   TOTAL AREA(ACRES) =       258.9   TOTAL RUNOFF(CFS) =     526.61
   TC(MIN.) =   12.97

*******************************************************************************
   FLOW PROCESS FROM NODE    335.00 TO NODE    335.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   12.97
   RAINFALL INTENSITY(INCH/HR) =   4.27
   TOTAL STREAM AREA(ACRES) =   258.94
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    526.61

*******************************************************************************
   FLOW PROCESS FROM NODE    336.00 TO NODE    337.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =    616.00
   DOWNSTREAM ELEVATION(FEET) =    614.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
   SUBAREA RUNOFF(CFS) =     1.09
   TOTAL AREA(ACRES) =       0.34   TOTAL RUNOFF(CFS) =      1.09

*******************************************************************************
   FLOW PROCESS FROM NODE    337.00 TO NODE    338.00 IS CODE =  62
-------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
   UPSTREAM ELEVATION(FEET) = 614.00  DOWNSTREAM ELEVATION(FEET) =  603.00
   STREET LENGTH(FEET) =   905.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```

```
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.29
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.37
     HALFSTREET FLOOD WIDTH(FEET) =   12.41
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.80
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
   STREET FLOW TRAVEL TIME(MIN.) =   5.38   Tc(MIN.) =   12.74
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.324
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
   SUBAREA AREA(ACRES) =    7.16      SUBAREA RUNOFF(CFS) =   16.10
   TOTAL AREA(ACRES) =        7.5      PEAK FLOW RATE(CFS) =      16.86

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.78
   FLOW VELOCITY(FEET/SEC.) =  3.23   DEPTH*VELOCITY(FT*FT/SEC.) =  1.43
   LONGEST FLOWPATH FROM NODE   336.00 TO NODE   338.00 =   1000.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   338.00 TO NODE   339.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   603.00  DOWNSTREAM(FEET) =   575.00
   FLOW LENGTH(FEET) = 1545.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.4 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  9.63
   ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     16.86
   PIPE TRAVEL TIME(MIN.) =   2.67    Tc(MIN.) =   15.41
   LONGEST FLOWPATH FROM NODE   336.00 TO NODE   339.00 =   2545.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   338.00 TO NODE   339.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.824
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5534
   SUBAREA AREA(ACRES) =   15.14   SUBAREA RUNOFF(CFS) =   33.00
   TOTAL AREA(ACRES) =       22.6   TOTAL RUNOFF(CFS) =      47.91
   TC(MIN.) =   15.41

******************************************************************************
  FLOW PROCESS FROM NODE   338.00 TO NODE   339.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.824
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5463
   SUBAREA AREA(ACRES) =    6.13   SUBAREA RUNOFF(CFS) =   12.19
   TOTAL AREA(ACRES) =       28.8   TOTAL RUNOFF(CFS) =      60.10
   TC(MIN.) =   15.41

******************************************************************************
  FLOW PROCESS FROM NODE   339.00 TO NODE   335.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   575.00  DOWNSTREAM(FEET) =   545.00
  FLOW LENGTH(FEET) =  950.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.23
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.10
  PIPE TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =   16.39
  LONGEST FLOWPATH FROM NODE   336.00 TO NODE   335.00 =   3495.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   339.00 TO NODE   335.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.676
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5420
  SUBAREA AREA(ACRES) =    5.64   SUBAREA RUNOFF(CFS) =   10.78
  TOTAL AREA(ACRES) =        34.4   TOTAL RUNOFF(CFS) =       68.55
  TC(MIN.) =   16.39

********************************************************************************
  FLOW PROCESS FROM NODE   335.00 TO NODE   335.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.39
  RAINFALL INTENSITY(INCH/HR) =   3.68
  TOTAL STREAM AREA(ACRES) =    34.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     68.55

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc       INTENSITY      AREA
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      526.61    12.97       4.274        258.94
     2       68.55    16.39       3.676         34.41

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc       INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
     1      580.87    12.97       4.274
     2      521.45    16.39       3.676

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     580.87   Tc(MIN.) =   12.97
  TOTAL AREA(ACRES) =        293.4
  LONGEST FLOWPATH FROM NODE  1308.00 TO NODE   335.00 =   6952.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   335.00 TO NODE   339.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   545.00  DOWNSTREAM(FEET) =   532.00
  FLOW LENGTH(FEET) =  625.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  72.0 INCH PIPE IS  57.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.00
  ESTIMATED PIPE DIAMETER(INCH) = 72.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     580.87
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   13.41
  LONGEST FLOWPATH FROM NODE  1308.00 TO NODE   339.00 =   7577.00 FEET.
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE    335.00 TO NODE    339.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.184
  RESIDENTIAL (10.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .6000
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4852
  SUBAREA AREA(ACRES) =    4.04   SUBAREA RUNOFF(CFS) =   10.14
  TOTAL AREA(ACRES) =      297.4   TOTAL RUNOFF(CFS) =     603.72
  TC(MIN.) =   13.41

*******************************************************************************
  FLOW PROCESS FROM NODE    335.00 TO NODE    339.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.184
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4859
  SUBAREA AREA(ACRES) =    6.44   SUBAREA RUNOFF(CFS) =   14.01
  TOTAL AREA(ACRES) =      303.8   TOTAL RUNOFF(CFS) =     617.73
  TC(MIN.) =   13.41

*******************************************************************************
  FLOW PROCESS FROM NODE    339.00 TO NODE    340.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    532.00  DOWNSTREAM(FEET) =   525.00
  FLOW LENGTH(FEET) =    845.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  93.0 INCH PIPE IS  73.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.55
  ESTIMATED PIPE DIAMETER(INCH) = 93.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     617.73
  PIPE TRAVEL TIME(MIN.) =   0.91    Tc(MIN.) =   14.31
  LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    340.00 =    8422.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    339.00 TO NODE    340.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.011
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4867
  SUBAREA AREA(ACRES) =    6.64   SUBAREA RUNOFF(CFS) =   13.85
  TOTAL AREA(ACRES) =      310.5   TOTAL RUNOFF(CFS) =     617.73
  TC(MIN.) =   14.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*******************************************************************************
  FLOW PROCESS FROM NODE    340.00 TO NODE    341.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.00  DOWNSTREAM(FEET) =    512.00
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  39.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  49.13
  ESTIMATED PIPE DIAMETER(INCH) = 54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     617.73
```

```
     PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    14.35
     LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    341.00 =    8522.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    340.00 TO NODE    341.00 IS CODE =  81
 ------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.005
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4839
   SUBAREA AREA(ACRES) =    6.34   SUBAREA RUNOFF(CFS) =    8.89
   TOTAL AREA(ACRES) =       316.8   TOTAL RUNOFF(CFS) =     617.73
   TC(MIN.) =   14.35
   NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 **************************************************************************
   FLOW PROCESS FROM NODE    340.00 TO NODE    341.00 IS CODE =  81
 ------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.005
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4831
   SUBAREA AREA(ACRES) =    1.85   SUBAREA RUNOFF(CFS) =    2.59
   TOTAL AREA(ACRES) =       318.7   TOTAL RUNOFF(CFS) =     617.73
   TC(MIN.) =   14.35
   NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 +----------------------------------------------------------------------------+
 | Discharge at Basin #3.                                                      |
 |                                                                            |
 |                                                                            |
 +----------------------------------------------------------------------------+

 **************************************************************************
   FLOW PROCESS FROM NODE    341.00 TO NODE    210.00 IS CODE =  31
 ------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    505.00
   FLOW LENGTH(FEET) =   985.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  90.0 INCH PIPE IS  72.1 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 16.28
   ESTIMATED PIPE DIAMETER(INCH) = 90.00     NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     617.73
   PIPE TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =    15.35
   LONGEST FLOWPATH FROM NODE   1308.00 TO NODE    210.00 =    9507.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    341.00 TO NODE    210.00 IS CODE =  81
 ------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.833
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4826
   SUBAREA AREA(ACRES) =    1.22   SUBAREA RUNOFF(CFS) =    1.64
   TOTAL AREA(ACRES) =       319.9   TOTAL RUNOFF(CFS) =     617.73
   TC(MIN.) =   15.35
   NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 **************************************************************************
   FLOW PROCESS FROM NODE    341.00 TO NODE    210.00 IS CODE =  81
```

```
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.833
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4861
  SUBAREA AREA(ACRES) =    4.20   SUBAREA RUNOFF(CFS) =   12.08
  TOTAL AREA(ACRES) =        324.1   TOTAL RUNOFF(CFS) =     617.73
  TC(MIN.) =   15.35
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

********************************************************************************
  FLOW PROCESS FROM NODE   210.00 TO NODE   210.00 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      617.73    15.35      3.833       324.08
  LONGEST FLOWPATH FROM NODE  1308.00 TO NODE    210.00 =   9507.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM    RUNOFF      Tc      INTENSITY     AREA
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1      222.40    15.90      3.748       139.44
  LONGEST FLOWPATH FROM NODE  1208.00 TO NODE    210.00 =   9937.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
     1      832.53    15.35      3.833
     2      826.43    15.90      3.748

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     832.53   Tc(MIN.) =   15.35
  TOTAL AREA(ACRES) =       463.5

********************************************************************************
  FLOW PROCESS FROM NODE   210.00 TO NODE   210.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   210.00 TO NODE   210.00 IS CODE =  10
--------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
================================================================================

+------------------------------------------------------------------------------+
| Confluence flow and save for later confluence.                               |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE  1351.00 TO NODE  1352.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1140.00
  DOWNSTREAM ELEVATION(FEET) =   1110.00
  ELEVATION DIFFERENCE(FEET) =     30.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =      0.12


*****************************************************************************
  FLOW PROCESS FROM NODE   1352.00 TO NODE   1353.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1110.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   820.00   CHANNEL SLOPE = 0.3476
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.758
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.17
  AVERAGE FLOW DEPTH(FEET) =  0.17   TRAVEL TIME(MIN.) =  1.91
  Tc(MIN.) =    8.17
  SUBAREA AREA(ACRES) =     6.31      SUBAREA RUNOFF(CFS) =  12.72
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       6.4      PEAK FLOW RATE(CFS) =    12.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   FLOW VELOCITY(FEET/SEC.) =  9.37
  LONGEST FLOWPATH FROM NODE   1351.00 TO NODE   1353.00 =    920.00 FEET.


*****************************************************************************
  FLOW PROCESS FROM NODE   1353.00 TO NODE   1354.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =   812.00
  FLOW LENGTH(FEET) =   505.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 10.28
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     12.82
  PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =    8.99
  LONGEST FLOWPATH FROM NODE   1351.00 TO NODE   1354.00 =   1425.00 FEET.


*****************************************************************************
  FLOW PROCESS FROM NODE   1354.00 TO NODE   1354.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.99
  RAINFALL INTENSITY(INCH/HR) =   5.41
  TOTAL STREAM AREA(ACRES) =    6.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    12.82


*****************************************************************************
  FLOW PROCESS FROM NODE   1355.00 TO NODE   1356.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1870.00
  DOWNSTREAM ELEVATION(FEET) =   1850.00
  ELEVATION DIFFERENCE(FEET) =     20.00
```

```
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
 SUBAREA RUNOFF(CFS) =      0.41
 TOTAL AREA(ACRES) =        0.17   TOTAL RUNOFF(CFS) =       0.41


 **************************************************************************
  FLOW PROCESS FROM NODE   1356.00 TO NODE   1357.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1850.00  DOWNSTREAM(FEET) =   1500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   897.00   CHANNEL SLOPE =  0.3902
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.027
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.11
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.35
  Tc(MIN.) =    7.61
  SUBAREA AREA(ACRES) =     16.59      SUBAREA RUNOFF(CFS) =   35.00
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        16.8        PEAK FLOW RATE(CFS) =      35.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   FLOW VELOCITY(FEET/SEC.) = 13.62
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1357.00 =    997.00 FEET.

 ***************************************************************************
  FLOW PROCESS FROM NODE   1357.00 TO NODE   1358.00 IS CODE =  51
 -------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 =========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1200.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   653.00   CHANNEL SLOPE =  0.4594
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.694
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.50
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   0.70
  Tc(MIN.) =    8.31
  SUBAREA AREA(ACRES) =      9.67      SUBAREA RUNOFF(CFS) =   19.27
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        26.4        PEAK FLOW RATE(CFS) =      52.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.57   FLOW VELOCITY(FEET/SEC.) = 16.28
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1358.00 =   1650.00 FEET.

 ***************************************************************************
  FLOW PROCESS FROM NODE   1358.00 TO NODE   1359.00 IS CODE =  51
 -------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 =========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   505.00   CHANNEL SLOPE =  0.2376
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.450
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.39
  AVERAGE FLOW DEPTH(FEET) =   0.83    TRAVEL TIME(MIN.) =   0.58
  Tc(MIN.) =    8.90
  SUBAREA AREA(ACRES) =    25.90        SUBAREA RUNOFF(CFS) =   49.40
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        52.3        PEAK FLOW RATE(CFS) =       99.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.94    FLOW VELOCITY(FEET/SEC.) = 15.50
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1359.00 =    2155.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1359.00 TO NODE   1360.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =   1000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   370.00   CHANNEL SLOPE =  0.2162
  CHANNEL BASE(FEET) =   10.00    "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.279
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     125.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.69
  AVERAGE FLOW DEPTH(FEET) =   0.71    TRAVEL TIME(MIN.) =   0.45
  Tc(MIN.) =    9.35
  SUBAREA AREA(ACRES) =    28.04        SUBAREA RUNOFF(CFS) =   51.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        80.4        PEAK FLOW RATE(CFS) =      148.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78    FLOW VELOCITY(FEET/SEC.) = 14.44
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1360.00 =    2525.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1360.00 TO NODE   1361.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    860.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1159.00   CHANNEL SLOPE =  0.1208
  CHANNEL BASE(FEET) =   10.00    "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.775
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.28
  AVERAGE FLOW DEPTH(FEET) =   0.98    TRAVEL TIME(MIN.) =   1.57
  Tc(MIN.) =   10.92
  SUBAREA AREA(ACRES) =    23.07        SUBAREA RUNOFF(CFS) =   38.56
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       103.4        PEAK FLOW RATE(CFS) =      172.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.00    FLOW VELOCITY(FEET/SEC.) = 12.40
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1361.00 =    3684.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1361.00 TO NODE   1362.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
```

```
   ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    830.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   499.00   CHANNEL SLOPE =  0.0601
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.554
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    191.54
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.99
   AVERAGE FLOW DEPTH(FEET) =  1.27   TRAVEL TIME(MIN.) =  0.83
   Tc(MIN.) =   11.76
   SUBAREA AREA(ACRES) =    23.43      SUBAREA RUNOFF(CFS) =   37.34
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      126.9        PEAK FLOW RATE(CFS) =     202.22

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.31   FLOW VELOCITY(FEET/SEC.) =  10.14
   LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1362.00 =   4183.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1362.00 TO NODE   1363.00 IS CODE =  51
---------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    830.00  DOWNSTREAM(FEET) =    820.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   281.00   CHANNEL SLOPE =  0.0356
   CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.419
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    234.54
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.36
   AVERAGE FLOW DEPTH(FEET) =  1.37   TRAVEL TIME(MIN.) =  0.56
   Tc(MIN.) =   12.32
   SUBAREA AREA(ACRES) =    41.79      SUBAREA RUNOFF(CFS) =   64.64
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      168.7        PEAK FLOW RATE(CFS) =     260.87

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.45   FLOW VELOCITY(FEET/SEC.) =   8.63
   LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1363.00 =   4464.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1363.00 TO NODE   1364.00 IS CODE =  51
---------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    810.00  DOWNSTREAM(FEET) =    795.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   215.00   CHANNEL SLOPE =  0.0698
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.349
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    265.96
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.56
   AVERAGE FLOW DEPTH(FEET) =  1.45   TRAVEL TIME(MIN.) =  0.31
   Tc(MIN.) =   12.63
   SUBAREA AREA(ACRES) =     6.69      SUBAREA RUNOFF(CFS) =   10.18
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      175.4        PEAK FLOW RATE(CFS) =     266.90

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.46   FLOW VELOCITY(FEET/SEC.) =  11.54
   LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1364.00 =   4679.00 FEET.
```

```
*****************************************************************************
  FLOW PROCESS FROM NODE   1364.00 TO NODE   1354.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   795.00  DOWNSTREAM(FEET) =   790.00
  FLOW LENGTH(FEET) =   720.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  66.0 INCH PIPE IS  52.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 13.08
  ESTIMATED PIPE DIAMETER(INCH) = 66.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    266.90
  PIPE TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =   13.54
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1354.00 =    5399.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1364.00 TO NODE   1354.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.157
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    4.06   SUBAREA RUNOFF(CFS) =    5.91
  TOTAL AREA(ACRES) =       179.4   TOTAL RUNOFF(CFS) =    266.90
  TC(MIN.) =   13.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****************************************************************************
  FLOW PROCESS FROM NODE   1354.00 TO NODE   1354.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.54
  RAINFALL INTENSITY(INCH/HR) =   4.16
  TOTAL STREAM AREA(ACRES) =   179.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    266.90

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc        INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       12.82      8.99        5.414          6.36
     2      266.90     13.54        4.157        179.41

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc        INTENSITY
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1      190.00      8.99        5.414
     2      276.74     13.54        4.157

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     276.74   Tc(MIN.) =   13.54
  TOTAL AREA(ACRES) =       185.8
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE   1354.00 =    5399.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1354.00 TO NODE    210.00 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) =   502.00
```

```
  FLOW LENGTH(FEET) =  6830.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  37.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.06
  ESTIMATED PIPE DIAMETER(INCH) =  48.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    276.74
  PIPE TRAVEL TIME(MIN.) =   4.37   Tc(MIN.) =   17.91
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE    210.00 =  12229.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   210.00 TO NODE    210.00 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      276.74     17.91       3.471       185.77
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE    210.00 =  12229.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM    RUNOFF      Tc        INTENSITY     AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1      832.53     15.35       3.833       463.52
  LONGEST FLOWPATH FROM NODE   1208.00 TO NODE    210.00 =   9937.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc        INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     1069.75     15.35       3.833
     2     1030.50     17.91       3.471

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1069.75   Tc(MIN.) =   15.35
  TOTAL AREA(ACRES) =      649.3

*****************************************************************************
  FLOW PROCESS FROM NODE   210.00 TO NODE    210.00 IS CODE =  12
-----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   210.00 TO NODE    342.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   502.00  DOWNSTREAM(FEET) =   499.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  84.0 INCH PIPE IS  68.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.97
  ESTIMATED PIPE DIAMETER(INCH) =  84.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   1069.75
  PIPE TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =   15.39
  LONGEST FLOWPATH FROM NODE   1355.00 TO NODE    342.00 =  12304.00 FEET.

+---------------------------------------------------------------------------+
| Discharge to Culvert #7                                                   |
|                                                                           |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE   401.00 TO NODE    402.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    642.00
  DOWNSTREAM ELEVATION(FEET) =    640.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =      0.96
  TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.96

******************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE = 62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 640.00  DOWNSTREAM ELEVATION(FEET) = 635.00
  STREET LENGTH(FEET) =    445.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.32
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.75
  STREET FLOW TRAVEL TIME(MIN.) =  3.19   Tc(MIN.) =   10.55
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.883
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
  SUBAREA AREA(ACRES) =    3.12       SUBAREA RUNOFF(CFS) =    7.92
  TOTAL AREA(ACRES) =        3.4       PEAK FLOW RATE(CFS) =      8.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) = 12.28
  FLOW VELOCITY(FEET/SEC.) = 2.67   DEPTH*VELOCITY(FT*FT/SEC.) =  0.99
  LONGEST FLOWPATH FROM NODE    401.00 TO NODE    403.00 =    540.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE = 31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    635.00  DOWNSTREAM(FEET) =    622.00
  FLOW LENGTH(FEET) =    250.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.24
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        8.68
  PIPE TRAVEL TIME(MIN.) =   0.34   Tc(MIN.) =   10.89
  LONGEST FLOWPATH FROM NODE    401.00 TO NODE    404.00 =    790.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE = 81
------------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.784
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5200
   SUBAREA AREA(ACRES) =    1.72   SUBAREA RUNOFF(CFS) =    4.28
   TOTAL AREA(ACRES) =       5.1   TOTAL RUNOFF(CFS) =      12.79
   TC(MIN.) =   10.89

*******************************************************************************
   FLOW PROCESS FROM NODE   404.00 TO NODE   404.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  3
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   10.89
   RAINFALL INTENSITY(INCH/HR) =   4.78
   TOTAL STREAM AREA(ACRES) =      5.14
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.79

*******************************************************************************
   FLOW PROCESS FROM NODE   405.00 TO NODE   406.00 IS CODE =   21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5000
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =    643.00
   DOWNSTREAM ELEVATION(FEET) =    641.00
   ELEVATION DIFFERENCE(FEET) =      2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.611
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.028
   SUBAREA RUNOFF(CFS) =      1.90
   TOTAL AREA(ACRES) =       0.63   TOTAL RUNOFF(CFS) =       1.90

*******************************************************************************
   FLOW PROCESS FROM NODE   406.00 TO NODE   407.00 IS CODE =   51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    641.00  DOWNSTREAM(FEET) =    628.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   730.00   CHANNEL SLOPE =  0.0178
   CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   50.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   5.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.662
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .5000
   S.C.S. CURVE NUMBER (AMC II) =  86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.96
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.37
   AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   8.87
   Tc(MIN.) =   16.48
   SUBAREA AREA(ACRES) =      9.39        SUBAREA RUNOFF(CFS) =   17.19
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.500
   TOTAL AREA(ACRES) =       10.0        PEAK FLOW RATE(CFS) =      18.35

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.19   FLOW VELOCITY(FEET/SEC.) =   1.66
   LONGEST FLOWPATH FROM NODE   405.00 TO NODE   407.00 =    825.00 FEET.

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

```
FLOW PROCESS FROM NODE   407.00 TO NODE   404.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   628.00  DOWNSTREAM(FEET) =   623.00
  FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.26
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.35
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   16.88
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   404.00 =   1070.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   407.00 TO NODE   404.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.606
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5779
  SUBAREA AREA(ACRES) =    2.87   SUBAREA RUNOFF(CFS) =    8.80
  TOTAL AREA(ACRES) =       12.9   TOTAL RUNOFF(CFS) =      26.86
  TC(MIN.) =   16.88

*******************************************************************************
  FLOW PROCESS FROM NODE   404.00 TO NODE   404.00 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.) =   16.88
  RAINFALL INTENSITY(INCH/HR) =   3.61
  TOTAL STREAM AREA(ACRES) =   12.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.86

*******************************************************************************
  FLOW PROCESS FROM NODE   408.00 TO NODE   409.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    633.00
  DOWNSTREAM ELEVATION(FEET) =    631.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =       0.13   TOTAL RUNOFF(CFS) =       0.42

*******************************************************************************
  FLOW PROCESS FROM NODE   409.00 TO NODE   410.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) = 631.00  DOWNSTREAM ELEVATION(FEET) =  628.00
  STREET LENGTH(FEET) =   375.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0350

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.40
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.32
  HALFSTREET FLOOD WIDTH(FEET) =    9.91
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.00
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.65
STREET FLOW TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =   10.48
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.904
RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  87
AREA-AVERAGE RUNOFF COEFFICIENT = 0.568
SUBAREA AREA(ACRES) =    2.84      SUBAREA RUNOFF(CFS) =    7.94
TOTAL AREA(ACRES) =        3.0       PEAK FLOW RATE(CFS) =       8.27

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.91
FLOW VELOCITY(FEET/SEC.) =  2.32   DEPTH*VELOCITY(FT*FT/SEC.) =   0.89
LONGEST FLOWPATH FROM NODE    408.00 TO NODE    410.00 =    470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    404.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   628.00  DOWNSTREAM(FEET) =   623.00
 FLOW LENGTH(FEET) =   505.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.42
 ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =        8.27
 PIPE TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =   11.79
 LONGEST FLOWPATH FROM NODE    408.00 TO NODE    404.00 =    975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    404.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.545
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  87
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5690
 SUBAREA AREA(ACRES) =    3.35   SUBAREA RUNOFF(CFS) =    8.68
 TOTAL AREA(ACRES) =        6.3   TOTAL RUNOFF(CFS) =      16.34
 TC(MIN.) =   11.79

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 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.) =   11.79
 RAINFALL INTENSITY(INCH/HR) =  4.54
 TOTAL STREAM AREA(ACRES) =     6.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.34
```

```
  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc      INTENSITY     AREA
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1      12.79     10.89       4.784        5.14
     2      26.86     16.88       3.606       12.89
     3      16.34     11.79       4.545        6.32

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
     1      45.21     10.89       4.784
     2      47.26     11.79       4.545
     3      49.47     16.88       3.606

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     49.47   Tc(MIN.) =   16.88
  TOTAL AREA(ACRES) =        24.4
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   404.00 =    1070.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   404.00 TO NODE   411.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   623.00  DOWNSTREAM(FEET) =   620.00
  FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.45
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.47
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   17.30
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   411.00 =    1335.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   404.00 TO NODE   411.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.549
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5599
  SUBAREA AREA(ACRES) =    2.09   SUBAREA RUNOFF(CFS) =    3.86
  TOTAL AREA(ACRES) =        26.4   TOTAL RUNOFF(CFS) =       52.54
  TC(MIN.) =   17.30

******************************************************************************
  FLOW PROCESS FROM NODE   411.00 TO NODE   411.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.30
  RAINFALL INTENSITY(INCH/HR) =   3.55
  TOTAL STREAM AREA(ACRES) =    26.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.54

******************************************************************************
  FLOW PROCESS FROM NODE   412.00 TO NODE   413.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
```

```
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =   633.00
   DOWNSTREAM ELEVATION(FEET) =    631.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
   SUBAREA RUNOFF(CFS) =      0.35
   TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.35

******************************************************************************
   FLOW PROCESS FROM NODE   413.00 TO NODE   411.00 IS CODE = 62
------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==============================================================================
   UPSTREAM ELEVATION(FEET) = 631.00  DOWNSTREAM ELEVATION(FEET) = 618.00
   STREET LENGTH(FEET) = 1082.00   CURB HEIGHT(INCHES) = 6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.46
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) = 0.35
     HALFSTREET FLOOD WIDTH(FEET) =   11.38
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.64
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.93
   STREET FLOW TRAVEL TIME(MIN.) =  6.83   Tc(MIN.) =   14.19
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.033
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) = 87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.569
   SUBAREA AREA(ACRES) =    6.05       SUBAREA RUNOFF(CFS) =   13.91
   TOTAL AREA(ACRES) =        6.2        PEAK FLOW RATE(CFS) =      14.14

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) = 14.78
   FLOW VELOCITY(FEET/SEC.) = 3.07   DEPTH*VELOCITY(FT*FT/SEC.) =  1.30
   LONGEST FLOWPATH FROM NODE   412.00 TO NODE   411.00 =   1177.00 FEET.

******************************************************************************
   FLOW PROCESS FROM NODE   411.00 TO NODE   411.00 IS CODE = 1
------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
   TOTAL NUMBER OF STREAMS = 2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   14.19
   RAINFALL INTENSITY(INCH/HR) =   4.03
   TOTAL STREAM AREA(ACRES) =    6.16
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.14

   ** CONFLUENCE DATA **
   STREAM     RUNOFF      Tc      INTENSITY      AREA
   NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       52.54    17.30       3.549        26.44
      2       14.14    14.19       4.033         6.16
```

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF     Tc       INTENSITY
  NUMBER     (CFS)    (MIN.)    (INCH/HOUR)
     1       60.38    14.19       4.033
     2       64.99    17.30       3.549

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      64.99   Tc(MIN.) =   17.30
  TOTAL AREA(ACRES) =        32.6
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   411.00 =   1335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   411.00 TO NODE   414.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   618.00  DOWNSTREAM(FEET) =   600.00
  FLOW LENGTH(FEET) = 1463.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 11.55
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.99
  PIPE TRAVEL TIME(MIN.) =   2.11    Tc(MIN.) =   19.41
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   414.00 =   2798.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   411.00 TO NODE   414.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.295
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  85
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5475
  SUBAREA AREA(ACRES) =    8.04   SUBAREA RUNOFF(CFS) =   12.98
  TOTAL AREA(ACRES) =       40.6   TOTAL RUNOFF(CFS) =      73.31
  TC(MIN.) =   19.41

****************************************************************************
  FLOW PROCESS FROM NODE   414.00 TO NODE   415.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   600.00  DOWNSTREAM(FEET) =   582.00
  FLOW LENGTH(FEET) =  952.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 14.11
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.31
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =   20.54
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   415.00 =   3750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   414.00 TO NODE   415.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.177
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5429
  SUBAREA AREA(ACRES) =    8.26   SUBAREA RUNOFF(CFS) =   13.65
  TOTAL AREA(ACRES) =        48.9   TOTAL RUNOFF(CFS) =      84.35
  TC(MIN.) =   20.54
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE   415.00 TO NODE    416.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   582.00  DOWNSTREAM(FEET) =   573.00
  FLOW LENGTH(FEET) = 1047.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 10.73
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     84.35
  PIPE TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   22.16
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE    416.00 =    4797.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   415.00 TO NODE    416.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.025
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5394
  SUBAREA AREA(ACRES) =    8.80   SUBAREA RUNOFF(CFS) =   13.84
  TOTAL AREA(ACRES) =       57.7   TOTAL RUNOFF(CFS) =       94.15
  TC(MIN.) =   22.16

*******************************************************************************
  FLOW PROCESS FROM NODE   416.00 TO NODE    417.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   573.00  DOWNSTREAM(FEET) =   565.00
  FLOW LENGTH(FEET) =  771.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 11.81
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     94.15
  PIPE TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   23.25
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE    417.00 =    5568.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   416.00 TO NODE    417.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.933
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5373
  SUBAREA AREA(ACRES) =    6.83   SUBAREA RUNOFF(CFS) =   10.42
  TOTAL AREA(ACRES) =       64.5   TOTAL RUNOFF(CFS) =      101.70
  TC(MIN.) =   23.25

*******************************************************************************
  FLOW PROCESS FROM NODE   417.00 TO NODE    417.00 IS CODE =  10
-------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
===============================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE   418.00 TO NODE    419.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
```

```
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =   652.00
 DOWNSTREAM ELEVATION(FEET) =   650.00
 ELEVATION DIFFERENCE(FEET) =     2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =   81.58
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
 SUBAREA RUNOFF(CFS) =     0.42
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =       0.42

********************************************************************************
  FLOW PROCESS FROM NODE   419.00 TO NODE    420.00 IS CODE = 62
--------------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
 UPSTREAM ELEVATION(FEET) = 651.00  DOWNSTREAM ELEVATION(FEET) = 643.00
 STREET LENGTH(FEET) =    628.00   CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.56
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.60
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.88
 STREET FLOW TRAVEL TIME(MIN.) =   4.02   Tc(MIN.) =   11.38
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.651
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 87
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.569
 SUBAREA AREA(ACRES) =    4.50       SUBAREA RUNOFF(CFS) =   11.93
 TOTAL AREA(ACRES) =        4.6        PEAK FLOW RATE(CFS) =      12.24

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) = 13.78
 FLOW VELOCITY(FEET/SEC.) = 3.03   DEPTH*VELOCITY(FT*FT/SEC.) =  1.22
 LONGEST FLOWPATH FROM NODE   418.00 TO NODE    420.00 =    723.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   420.00 TO NODE    421.00 IS CODE = 31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   643.00  DOWNSTREAM(FEET) =   640.00
 FLOW LENGTH(FEET) =   345.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.72
 ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     12.24
 PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =   12.23
 LONGEST FLOWPATH FROM NODE    418.00 TO NODE    421.00 =   1068.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   420.00 TO NODE    421.00 IS CODE = 81
```

```
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.439
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5693
   SUBAREA AREA(ACRES) =    4.17   SUBAREA RUNOFF(CFS) =   10.55
   TOTAL AREA(ACRES) =        8.8   TOTAL RUNOFF(CFS) =      22.24
   TC(MIN.) =   12.23

********************************************************************************
   FLOW PROCESS FROM NODE    421.00 TO NODE    421.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   12.23
   RAINFALL INTENSITY(INCH/HR) =   4.44
   TOTAL STREAM AREA(ACRES) =      8.80
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.24

********************************************************************************
   FLOW PROCESS FROM NODE    422.00 TO NODE    423.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =    667.00
   DOWNSTREAM ELEVATION(FEET) =    665.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   6.161
   SUBAREA RUNOFF(CFS) =      0.64
   TOTAL AREA(ACRES) =       0.20   TOTAL RUNOFF(CFS) =      0.64

********************************************************************************
   FLOW PROCESS FROM NODE    423.00 TO NODE    421.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
   UPSTREAM ELEVATION(FEET) =  665.00  DOWNSTREAM ELEVATION(FEET) =  640.00
   STREET LENGTH(FEET) =   725.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.31
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.28
      HALFSTREET FLOOD WIDTH(FEET) =    7.78
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.67
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
   STREET FLOW TRAVEL TIME(MIN.) =   3.29  Tc(MIN.) =   10.65
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.854
   RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  87
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.567
   SUBAREA AREA(ACRES) =    3.36      SUBAREA RUNOFF(CFS) =    9.30
   TOTAL AREA(ACRES) =        3.6       PEAK FLOW RATE(CFS) =      9.80

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.24
   FLOW VELOCITY(FEET/SEC.) =  4.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.39
   LONGEST FLOWPATH FROM NODE   422.00 TO NODE    421.00 =    820.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   421.00 TO NODE    421.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =  10.65
   RAINFALL INTENSITY(INCH/HR) =   4.85
   TOTAL STREAM AREA(ACRES) =     3.56
   PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.80

   ** CONFLUENCE DATA **
   STREAM     RUNOFF       Tc        INTENSITY       AREA
   NUMBER     (CFS)      (MIN.)     (INCH/HOUR)     (ACRE)
      1       22.24     12.23        4.439          8.80
      2        9.80     10.65        4.854          3.56

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF       Tc        INTENSITY
   NUMBER     (CFS)      (MIN.)     (INCH/HOUR)
      1       29.16     10.65        4.854
      2       31.20     12.23        4.439

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      31.20   Tc(MIN.) =   12.23
   TOTAL AREA(ACRES) =        12.4
   LONGEST FLOWPATH FROM NODE   418.00 TO NODE    421.00 =   1068.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   421.00 TO NODE    424.00 IS CODE =  31
----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   640.00  DOWNSTREAM(FEET) =   629.00
   FLOW LENGTH(FEET) =   306.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.5 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  14.59
   ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      31.20
   PIPE TRAVEL TIME(MIN.) =   0.35   Tc(MIN.) =   12.58
   LONGEST FLOWPATH FROM NODE   418.00 TO NODE    424.00 =   1374.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   424.00 TO NODE    424.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =  12.58
   RAINFALL INTENSITY(INCH/HR) =   4.36
   TOTAL STREAM AREA(ACRES) =    12.36
```

```
    PEAK FLOW RATE(CFS) AT CONFLUENCE =      31.20

*******************************************************************************
  FLOW PROCESS FROM NODE    425.00 TO NODE    426.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
  UPSTREAM ELEVATION(FEET) =   645.00
  DOWNSTREAM ELEVATION(FEET) =   643.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   6.161
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =       0.17   TOTAL RUNOFF(CFS) =       0.54

*******************************************************************************
  FLOW PROCESS FROM NODE    426.00 TO NODE    424.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =  643.00  DOWNSTREAM ELEVATION(FEET) =  629.00
  STREET LENGTH(FEET) =   768.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   10.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.11
  STREET FLOW TRAVEL TIME(MIN.) =   4.00   Tc(MIN.) =   11.36
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   4.656
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    6.46        SUBAREA RUNOFF(CFS) =   15.64
  TOTAL AREA(ACRES) =        6.6         PEAK FLOW RATE(CFS) =      16.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) = 14.28
  FLOW VELOCITY(FEET/SEC.) = 3.72   DEPTH*VELOCITY(FT*FT/SEC.) =   1.53
  LONGEST FLOWPATH FROM NODE    425.00 TO NODE    424.00 =     863.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    424.00 TO NODE    424.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.36
```

```
 RAINFALL INTENSITY(INCH/HR) =   4.66
 TOTAL STREAM AREA(ACRES) =      6.63
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.05

 ** CONFLUENCE DATA **
 STREAM    RUNOFF      Tc      INTENSITY     AREA
 NUMBER    (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
    1      31.20     12.58      4.359        12.36
    2      16.05     11.36      4.656         6.63

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

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF      Tc      INTENSITY
 NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
    1      45.26     11.36      4.656
    2      46.23     12.58      4.359

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      46.23   Tc(MIN.) =   12.58
 TOTAL AREA(ACRES) =       19.0
 LONGEST FLOWPATH FROM NODE   418.00 TO NODE   424.00 =    1374.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   424.00 TO NODE   427.00 IS CODE =  31
-------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   629.00  DOWNSTREAM(FEET) =   608.00
 FLOW LENGTH(FEET) = 1034.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 12.93
 ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      46.23
 PIPE TRAVEL TIME(MIN.) =   1.33   Tc(MIN.) =   13.91
 LONGEST FLOWPATH FROM NODE   418.00 TO NODE   427.00 =    2408.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   424.00 TO NODE   427.00 IS CODE =  81
-------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.085
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5438
 SUBAREA AREA(ACRES) =    6.33   SUBAREA RUNOFF(CFS) =   13.44
 TOTAL AREA(ACRES) =       25.3   TOTAL RUNOFF(CFS) =      56.24
 TC(MIN.) =   13.91

*******************************************************************************
  FLOW PROCESS FROM NODE   427.00 TO NODE   428.00 IS CODE =  31
-------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   608.00  DOWNSTREAM(FEET) =   590.00
 FLOW LENGTH(FEET) =  883.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.25
 ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      56.24
 PIPE TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   15.03
 LONGEST FLOWPATH FROM NODE   418.00 TO NODE   428.00 =    3291.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   427.00 TO NODE   428.00 IS CODE =  81
-------------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.887
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) = 86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5377
   SUBAREA AREA(ACRES) =     8.70   SUBAREA RUNOFF(CFS) =   17.59
   TOTAL AREA(ACRES) =        34.0   TOTAL RUNOFF(CFS) =       71.11
   TC(MIN.) =    15.03

*******************************************************************************
   FLOW PROCESS FROM NODE    428.00 TO NODE    428.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   15.03
   RAINFALL INTENSITY(INCH/HR) =   3.89
   TOTAL STREAM AREA(ACRES) =    34.02
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     71.11

*******************************************************************************
   FLOW PROCESS FROM NODE    429.00 TO NODE    430.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
   UPSTREAM ELEVATION(FEET) =    643.00
   DOWNSTREAM ELEVATION(FEET) =    641.00
   ELEVATION DIFFERENCE(FEET) =      2.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.801
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    86.58
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.121
   SUBAREA RUNOFF(CFS) =      0.82
   TOTAL AREA(ACRES) =        0.46   TOTAL RUNOFF(CFS) =      0.82

*******************************************************************************
   FLOW PROCESS FROM NODE    430.00 TO NODE    431.00 IS CODE =  62
-------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
   UPSTREAM ELEVATION(FEET) = 641.00  DOWNSTREAM ELEVATION(FEET) = 634.00
   STREET LENGTH(FEET) =    630.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 28.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.18
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.31
     HALFSTREET FLOOD WIDTH(FEET) =   9.01
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.25
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
   STREET FLOW TRAVEL TIME(MIN.) =   4.67   Tc(MIN.) =   14.47
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.983
```

```
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.721
 SUBAREA AREA(ACRES) =    2.15     SUBAREA RUNOFF(CFS) =    6.85
 TOTAL AREA(ACRES) =       2.6       PEAK FLOW RATE(CFS) =      7.49

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.55
 FLOW VELOCITY(FEET/SEC.) =  2.58   DEPTH*VELOCITY(FT*FT/SEC.) =   0.92
 LONGEST FLOWPATH FROM NODE   429.00 TO NODE    431.00 =    725.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    431.00 TO NODE    428.00 IS CODE =  31
---------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   634.00 DOWNSTREAM(FEET) =   595.00
  FLOW LENGTH(FEET) =  835.00   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.) =  11.31
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =        7.49
  PIPE TRAVEL TIME(MIN.) =   1.23    Tc(MIN.) =   15.70
  LONGEST FLOWPATH FROM NODE    429.00 TO NODE    428.00 =    1560.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    431.00 TO NODE    428.00 IS CODE =  81
---------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.779
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7381
  SUBAREA AREA(ACRES) =    3.83    SUBAREA RUNOFF(CFS) =  10.85
  TOTAL AREA(ACRES) =       6.4    TOTAL RUNOFF(CFS) =       17.96
  TC(MIN.) =   15.70

*****************************************************************************
  FLOW PROCESS FROM NODE    428.00 TO NODE    428.00 IS CODE =   1
---------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.70
  RAINFALL INTENSITY(INCH/HR) =   3.78
  TOTAL STREAM AREA(ACRES) =   6.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.96

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       71.11     15.03      3.887        34.02
     2       17.96     15.70      3.779         6.44

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       88.30     15.03      3.887
     2       87.08     15.70      3.779

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      88.30   Tc(MIN.) =   15.03
  TOTAL AREA(ACRES) =       40.5
  LONGEST FLOWPATH FROM NODE    418.00 TO NODE    428.00 =   3291.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE    428.00 TO NODE    427.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   595.00  DOWNSTREAM(FEET) =   565.00
  FLOW LENGTH(FEET) =  495.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 22.68
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      88.30
  PIPE TRAVEL TIME(MIN.) =   0.36   Tc(MIN.) =   15.39
  LONGEST FLOWPATH FROM NODE    418.00 TO NODE    427.00 =   3786.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE    428.00 TO NODE    417.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.828
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5665
  SUBAREA AREA(ACRES) =    2.68   SUBAREA RUNOFF(CFS) =    5.33
  TOTAL AREA(ACRES) =        43.1   TOTAL RUNOFF(CFS) =       93.55
  TC(MIN.) =   15.39


*******************************************************************************
  FLOW PROCESS FROM NODE    417.00 TO NODE    417.00 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        93.55     15.39       3.828        43.14
  LONGEST FLOWPATH FROM NODE    418.00 TO NODE    417.00 =   3786.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       101.70     23.25       2.933        64.53
  LONGEST FLOWPATH FROM NODE    405.00 TO NODE    417.00 =   5568.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       160.85     15.39       3.828
     2       173.38     23.25       2.933

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     173.38   Tc(MIN.) =   23.25
  TOTAL AREA(ACRES) =      107.7


*******************************************************************************
  FLOW PROCESS FROM NODE    417.00 TO NODE    417.00 IS CODE =  12
------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
==============================================================================


*******************************************************************************
  FLOW PROCESS FROM NODE    417.00 TO NODE    432.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   565.00  DOWNSTREAM(FEET) =   560.00
  FLOW LENGTH(FEET) =   485.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  41.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.42
  ESTIMATED PIPE DIAMETER(INCH) = 57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    173.38
  PIPE TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =   23.90
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   432.00 =   6053.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   417.00 TO NODE   432.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.881
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5474
  SUBAREA AREA(ACRES) =    6.50   SUBAREA RUNOFF(CFS) =    9.74
  TOTAL AREA(ACRES) =       114.2   TOTAL RUNOFF(CFS) =     180.06
  TC(MIN.) =   23.90

*****************************************************************************
  FLOW PROCESS FROM NODE   432.00 TO NODE   433.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   560.00  DOWNSTREAM(FEET) =   510.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 41.84
  ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    180.06
  PIPE TRAVEL TIME(MIN.) =   0.08   Tc(MIN.) =   23.98
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE   433.00 =   6253.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   432.00 TO NODE   433.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.875
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5440
  SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    1.96
  TOTAL AREA(ACRES) =       116.1   TOTAL RUNOFF(CFS) =     181.63
  TC(MIN.) =   23.98

+---------------------------------------------------------------------------+
| Disccharge at basin #4.                                                   |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE   433.00 TO NODE   434.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   510.00  DOWNSTREAM(FEET) =   505.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 25.47
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
```

```
   PIPE-FLOW(CFS) =     181.63
   PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   24.05
   LONGEST FLOWPATH FROM NODE    405.00 TO NODE    434.00 =   6353.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    433.00 TO NODE    434.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.870
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5291
  SUBAREA AREA(ACRES) =    9.70   SUBAREA RUNOFF(CFS) =    9.74
  TOTAL AREA(ACRES) =      125.8   TOTAL RUNOFF(CFS) =     191.06
  TC(MIN.) =   24.05

*****************************************************************************
  FLOW PROCESS FROM NODE    433.00 TO NODE    434.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.870
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5311
  SUBAREA AREA(ACRES) =    0.68   SUBAREA RUNOFF(CFS) =    1.76
  TOTAL AREA(ACRES) =      126.5   TOTAL RUNOFF(CFS) =     192.81
  TC(MIN.) =   24.05

*****************************************************************************
  FLOW PROCESS FROM NODE    434.00 TO NODE    435.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    505.00  DOWNSTREAM(FEET) =    500.00
  FLOW LENGTH(FEET) =    285.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.35
  ESTIMATED PIPE DIAMETER(INCH) = 51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     192.81
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =   24.32
  LONGEST FLOWPATH FROM NODE    405.00 TO NODE    435.00 =   6638.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    434.00 TO NODE    435.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.849
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5236
  SUBAREA AREA(ACRES) =    5.42   SUBAREA RUNOFF(CFS) =    5.40
  TOTAL AREA(ACRES) =      131.9   TOTAL RUNOFF(CFS) =     196.82
  TC(MIN.) =   24.32

*****************************************************************************
  FLOW PROCESS FROM NODE    434.00 TO NODE    435.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.849
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5271
```

```
  SUBAREA AREA(ACRES) =     1.22   SUBAREA RUNOFF(CFS) =     3.13
  TOTAL AREA(ACRES) =      133.1   TOTAL RUNOFF(CFS) =     199.94
  TC(MIN.) =   24.32


*******************************************************************************
  FLOW PROCESS FROM NODE   435.00 TO NODE    436.00 IS CODE =  31
-------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   500.00  DOWNSTREAM(FEET) =   495.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 29.45
  ESTIMATED PIPE DIAMETER(INCH) = 39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    199.94
  PIPE TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =   24.36
  LONGEST FLOWPATH FROM NODE   405.00 TO NODE    436.00 =   6708.00 FEET.


+-----------------------------------------------------------------------+
| Disharge at Culvert #9.                                               |
|                                                                       |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+


*******************************************************************************
  FLOW PROCESS FROM NODE  2001.00 TO NODE   2002.00 IS CODE =  21
-------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
 *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    570.00
  DOWNSTREAM ELEVATION(FEET) =    560.00
  ELEVATION DIFFERENCE(FEET) =    10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =     0.48
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =     0.48


*******************************************************************************
  FLOW PROCESS FROM NODE  2002.00 TO NODE   2003.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    517.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   865.00   CHANNEL SLOPE = 0.0497
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.631
 *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.58
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =    8.46
  SUBAREA AREA(ACRES) =     2.48      SUBAREA RUNOFF(CFS) =    4.89
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        2.7       PEAK FLOW RATE(CFS) =       5.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   7.91
  LONGEST FLOWPATH FROM NODE  2001.00 TO NODE   2003.00 =   965.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE  2002.00 TO NODE   2003.00 IS CODE =  81
```

```
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.631
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5016
  SUBAREA AREA(ACRES) =   1.02   SUBAREA RUNOFF(CFS) =    5.17
  TOTAL AREA(ACRES) =         3.7   TOTAL RUNOFF(CFS) =      10.45
  TC(MIN.) =    8.46


********************************************************************************
  FLOW PROCESS FROM NODE  2003.00 TO NODE   2004.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   525.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =   570.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.46
  ESTIMATED PIPE DIAMETER(INCH) = 18.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.45
  PIPE TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =    9.58
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2004.00 =    1535.00 FEET.


********************************************************************************
  FLOW PROCESS FROM NODE  2003.00 TO NODE   2004.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.197
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5396
  SUBAREA AREA(ACRES) =   0.39   SUBAREA RUNOFF(CFS) =    1.82
  TOTAL AREA(ACRES) =         4.1   TOTAL RUNOFF(CFS) =      11.47
  TC(MIN.) =    9.58


********************************************************************************
  FLOW PROCESS FROM NODE  2003.00 TO NODE   2004.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.197
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4905
  SUBAREA AREA(ACRES) =   1.43   SUBAREA RUNOFF(CFS) =    2.60
  TOTAL AREA(ACRES) =         5.5   TOTAL RUNOFF(CFS) =      14.07
  TC(MIN.) =    9.58


********************************************************************************
  FLOW PROCESS FROM NODE  2004.00 TO NODE   2005.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   515.00  DOWNSTREAM(FEET) =   505.00
  FLOW LENGTH(FEET) =   415.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.16
  ESTIMATED PIPE DIAMETER(INCH) = 18.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.07
  PIPE TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   10.26
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2005.00 =    1950.00 FEET.


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

```
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2005.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.971
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5336
  SUBAREA AREA(ACRES) =    0.65   SUBAREA RUNOFF(CFS) =    2.91
  TOTAL AREA(ACRES) =       6.2   TOTAL RUNOFF(CFS) =     16.37
  TC(MIN.) =   10.26


*******************************************************************************
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2005.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.971
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4839
  SUBAREA AREA(ACRES) =    2.29   SUBAREA RUNOFF(CFS) =    3.98
  TOTAL AREA(ACRES) =       8.5   TOTAL RUNOFF(CFS) =     20.35
  TC(MIN.) =   10.26


*******************************************************************************
  FLOW PROCESS FROM NODE   2005.00 TO NODE   2006.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   505.00  DOWNSTREAM(FEET) =   500.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 19.36
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.35
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   10.30
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2006.00 =    2000.00 FEET.


  +---------------------------------------------------------------------------+
  | Dsicharge at Culvert #12                                                  |
  |                                                                           |
  |                                                                           |
  +---------------------------------------------------------------------------+


*******************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    590.00
  DOWNSTREAM ELEVATION(FEET) =    580.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =     0.93
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      0.93


*******************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   580.00  DOWNSTREAM(FEET) =   525.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  470.00   CHANNEL SLOPE =  0.1170
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.315
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.61
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   0.82
  Tc(MIN.) =    7.08
  SUBAREA AREA(ACRES) =     2.98      SUBAREA RUNOFF(CFS) =    6.59
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        3.4         PEAK FLOW RATE(CFS) =       7.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   FLOW VELOCITY(FEET/SEC.) =  11.66
  LONGEST FLOWPATH FROM NODE   2101.00 TO NODE   2103.00 =    570.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.315
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4669
  SUBAREA AREA(ACRES) =    0.91   SUBAREA RUNOFF(CFS) =    5.17
  TOTAL AREA(ACRES) =        4.3   TOTAL RUNOFF(CFS) =     12.62
  TC(MIN.) =    7.08

******************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2104.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   525.00  DOWNSTREAM(FEET) =   500.00
  FLOW LENGTH(FEET) =  575.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.58
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.62
  PIPE TRAVEL TIME(MIN.) =   0.76   Tc(MIN.) =    7.84
  LONGEST FLOWPATH FROM NODE   2101.00 TO NODE   2104.00 =   1145.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2104.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.912
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4047
  SUBAREA AREA(ACRES) =    4.87   SUBAREA RUNOFF(CFS) =   10.08
  TOTAL AREA(ACRES) =        9.1   TOTAL RUNOFF(CFS) =     21.89
  TC(MIN.) =    7.84

******************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2104.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.912
```

```
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4768
 SUBAREA AREA(ACRES) =    1.56   SUBAREA RUNOFF(CFS) =    8.30
 TOTAL AREA(ACRES) =       10.7   TOTAL RUNOFF(CFS) =       30.19
 TC(MIN.) =    7.84


*******************************************************************************
 FLOW PROCESS FROM NODE   2104.00 TO NODE   2105.00 IS CODE =  31
-------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    500.00 DOWNSTREAM(FEET) =    495.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.81
 ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       30.19
 PIPE TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    7.88
 LONGEST FLOWPATH FROM NODE   2101.00 TO NODE   2105.00 =    1195.00 FEET.


+-----------------------------------------------------------------------------+
| Discharge at Culvert #14.                                                   |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+


*******************************************************************************
 FLOW PROCESS FROM NODE   1401.00 TO NODE   1402.00 IS CODE =  21
-------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1585.00
 DOWNSTREAM ELEVATION(FEET) =   1570.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
 SUBAREA RUNOFF(CFS) =      0.14
 TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =       0.14


*******************************************************************************
 FLOW PROCESS FROM NODE   1402.00 TO NODE   1403.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1570.00  DOWNSTREAM(FEET) =    940.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1526.00   CHANNEL SLOPE =  0.4128
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.180
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.67
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
 AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   3.36
 Tc(MIN.) =    9.63
 SUBAREA AREA(ACRES) =    12.43        SUBAREA RUNOFF(CFS) =   22.54
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        12.5        PEAK FLOW RATE(CFS) =       22.64

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.22   FLOW VELOCITY(FEET/SEC.) =   9.67
```

```
    LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1403.00 =    1626.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1403.00 TO NODE   1404.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    940.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   808.00   CHANNEL SLOPE =  0.1733
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.685
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.30
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =   11.25
  SUBAREA AREA(ACRES) =    25.13       SUBAREA RUNOFF(CFS) =   41.21
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       37.6       PEAK FLOW RATE(CFS) =      61.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   FLOW VELOCITY(FEET/SEC.) =  9.39
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1404.00 =    2434.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1404.00 TO NODE   1405.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    740.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.00   CHANNEL SLOPE =  0.0875
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.340
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.08
  AVERAGE FLOW DEPTH(FEET) =    0.57   TRAVEL TIME(MIN.) =   1.42
  Tc(MIN.) =   12.67
  SUBAREA AREA(ACRES) =    19.93       SUBAREA RUNOFF(CFS) =   30.27
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       57.5       PEAK FLOW RATE(CFS) =      87.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   FLOW VELOCITY(FEET/SEC.) =  8.44
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1405.00 =    3120.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1405.00 TO NODE   1406.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    660.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1090.00   CHANNEL SLOPE =  0.0734
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.932
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     112.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.67
  AVERAGE FLOW DEPTH(FEET) =    0.75   TRAVEL TIME(MIN.) =   2.09
```

```
  Tc(MIN.) =   14.76
  SUBAREA AREA(ACRES) =    36.15      SUBAREA RUNOFF(CFS) =   49.75
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       93.7       PEAK FLOW RATE(CFS) =    128.95


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.81   FLOW VELOCITY(FEET/SEC.) =   9.09
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1406.00 =   4210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1406.00 TO NODE   1407.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    660.00  DOWNSTREAM(FEET) =    595.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1110.00   CHANNEL SLOPE =  0.0586
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.618
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    154.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.11
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   16.79
  SUBAREA AREA(ACRES) =    40.02      SUBAREA RUNOFF(CFS) =   50.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       133.7       PEAK FLOW RATE(CFS) =    169.35


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.03   FLOW VELOCITY(FEET/SEC.) =   9.41
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1407.00 =   5320.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1407.00 TO NODE   1408.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    595.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  771.00   CHANNEL SLOPE =  0.0454
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.428
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    183.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.74
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =   18.26
  SUBAREA AREA(ACRES) =    24.14      SUBAREA RUNOFF(CFS) =   28.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       157.9       PEAK FLOW RATE(CFS) =    189.39


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.16   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1408.00 =   6091.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1408.00 TO NODE   1409.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    550.00
  FLOW LENGTH(FEET) =   228.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.87
```

```
   ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     189.39
   PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    18.43
   LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1409.00 =   6319.00 FEET.


*******************************************************************************
   FLOW PROCESS FROM NODE   1408.00 TO NODE   1409.00 IS CODE =  81
-------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.407
   *USER SPECIFIED(SUBAREA):
   STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.3664
   SUBAREA AREA(ACRES) =    4.85   SUBAREA RUNOFF(CFS) =   14.87
   TOTAL AREA(ACRES) =       162.7   TOTAL RUNOFF(CFS) =     203.10
   TC(MIN.) =   18.43


*******************************************************************************
   FLOW PROCESS FROM NODE   1409.00 TO NODE   1410.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    550.00  DOWNSTREAM(FEET) =    530.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.0455
   CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.310
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    207.33
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.66
   AVERAGE FLOW DEPTH(FEET) =  1.06   TRAVEL TIME(MIN.) =   0.85
   Tc(MIN.) =   19.28
   SUBAREA AREA(ACRES) =    7.29       SUBAREA RUNOFF(CFS) =    8.44
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.366
   TOTAL AREA(ACRES) =       170.0       PEAK FLOW RATE(CFS) =    205.75

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 1.06   FLOW VELOCITY(FEET/SEC.) =   8.61
   LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1410.00 =   6759.00 FEET.


*******************************************************************************
   FLOW PROCESS FROM NODE   1410.00 TO NODE   1410.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   19.28
   RAINFALL INTENSITY(INCH/HR) =   3.31
   TOTAL STREAM AREA(ACRES) =   170.00
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    205.75


*******************************************************************************
   FLOW PROCESS FROM NODE   1411.00 TO NODE   1412.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =    855.00
   DOWNSTREAM ELEVATION(FEET) =    845.00
   ELEVATION DIFFERENCE(FEET) =     10.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
   SUBAREA RUNOFF(CFS) =      0.57
   TOTAL AREA(ACRES) =       0.24   TOTAL RUNOFF(CFS) =       0.57

*****************************************************************************
  FLOW PROCESS FROM NODE   1412.00 TO NODE   1413.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    845.00  DOWNSTREAM(FEET) =    575.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1725.00   CHANNEL SLOPE = 0.1565
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.144
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.29
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =     9.73
  SUBAREA AREA(ACRES) =    21.20       SUBAREA RUNOFF(CFS) =   38.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       21.4        PEAK FLOW RATE(CFS) =       38.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   FLOW VELOCITY(FEET/SEC.) = 10.38
  LONGEST FLOWPATH FROM NODE   1411.00 TO NODE   1413.00 =    1825.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1413.00 TO NODE   1414.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    575.00  DOWNSTREAM(FEET) =    550.00
  FLOW LENGTH(FEET) =    244.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 22.73
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.60
  PIPE TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =     9.91
  LONGEST FLOWPATH FROM NODE   1411.00 TO NODE   1414.00 =    2069.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1414.00 TO NODE   1410.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    550.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  278.00   CHANNEL SLOPE = 0.0719
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.902
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.07
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   0.57
  Tc(MIN.) =    10.49
  SUBAREA AREA(ACRES) =     2.22       SUBAREA RUNOFF(CFS) =    3.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       23.7        PEAK FLOW RATE(CFS) =       40.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.77   FLOW VELOCITY(FEET/SEC.) =   8.09
  LONGEST FLOWPATH FROM NODE   1411.00 TO NODE   1410.00 =    2347.00 FEET.
```

```
******************************************************************************
  FLOW PROCESS FROM NODE   1410.00 TO NODE   1410.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.49
  RAINFALL INTENSITY(INCH/HR) =   4.90
  TOTAL STREAM AREA(ACRES) =    23.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1      205.75     19.28      3.310       170.00
     2       40.60     10.49      4.902        23.66

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      152.48     10.49      4.902
     2      233.15     19.28      3.310

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      233.15   Tc(MIN.) =   19.28
  TOTAL AREA(ACRES) =      193.7
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1410.00 =    6759.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   1410.00 TO NODE   1415.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  963.00   CHANNEL SLOPE = 0.0312
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.107
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    243.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.07
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   21.27
  SUBAREA AREA(ACRES) =    19.87      SUBAREA RUNOFF(CFS) =   21.60
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.362
  TOTAL AREA(ACRES) =      213.5        PEAK FLOW RATE(CFS) =     240.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.29   FLOW VELOCITY(FEET/SEC.) =   8.05
  LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1415.00 =   7722.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   1415.00 TO NODE   1416.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    500.00  DOWNSTREAM(FEET) =    480.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  740.00   CHANNEL SLOPE = 0.0270
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.939
  *USER SPECIFIED(SUBAREA):
```

```
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    254.84
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.46
 AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   1.91
 Tc(MIN.) =   23.18
 SUBAREA AREA(ACRES) =     27.95      SUBAREA RUNOFF(CFS) =   28.75
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.361
 TOTAL AREA(ACRES) =      241.5       PEAK FLOW RATE(CFS) =     256.25

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.94   FLOW VELOCITY(FEET/SEC.) =   6.49
 LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1416.00 =    8462.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1416.00 TO NODE   1417.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    480.00 DOWNSTREAM(FEET) =   475.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  45.0 INCH PIPE IS  35.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  27.19
 ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    256.25
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   23.24
 LONGEST FLOWPATH FROM NODE   1401.00 TO NODE   1417.00 =    8562.00 FEET.

+--------------------------------------------------------------------------+
| Discharge at Culvert #15.                                                |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+


****************************************************************************
 FLOW PROCESS FROM NODE   1501.00 TO NODE   1502.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    660.00
 DOWNSTREAM ELEVATION(FEET) =    645.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
 SUBAREA RUNOFF(CFS) =      0.74
 TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.74

****************************************************************************
 FLOW PROCESS FROM NODE   1502.00 TO NODE   1503.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    645.00  DOWNSTREAM(FEET) =    615.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0500
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   4.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.509
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.66
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.03
 AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   2.48
 Tc(MIN.) =    8.75
```

```
      SUBAREA AREA(ACRES) =      8.13      SUBAREA RUNOFF(CFS) =   15.68
      AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
      TOTAL AREA(ACRES) =          8.4       PEAK FLOW RATE(CFS) =      16.27

      END OF SUBAREA CHANNEL FLOW HYDRAULICS:
      DEPTH(FEET) = 0.48   FLOW VELOCITY(FEET/SEC.) =   4.93
      LONGEST FLOWPATH FROM NODE  1501.00 TO NODE  1503.00 =    700.00 FEET.

*****************************************************************************
   FLOW PROCESS FROM NODE  1503.00 TO NODE  1504.00 IS CODE =  51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    615.00  DOWNSTREAM(FEET) =    490.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 1075.00    CHANNEL SLOPE = 0.1163
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.078
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     36.52
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.18
   AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   1.18
   Tc(MIN.) =     9.93
   SUBAREA AREA(ACRES) =     22.78      SUBAREA RUNOFF(CFS) =   40.48
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =         31.2       PEAK FLOW RATE(CFS) =      55.48

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.47   FLOW VELOCITY(FEET/SEC.) =  17.24
   LONGEST FLOWPATH FROM NODE  1501.00 TO NODE  1504.00 =   1775.00 FEET.

*****************************************************************************
   FLOW PROCESS FROM NODE  1504.00 TO NODE  1505.00 IS CODE =  31
------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =    485.00
   FLOW LENGTH(FEET) =     50.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  24.64
   ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =       55.48
   PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =     9.96
   LONGEST FLOWPATH FROM NODE  1501.00 TO NODE  1505.00 =   1825.00 FEET.

*****************************************************************************
   FLOW PROCESS FROM NODE  1504.00 TO NODE  1505.00 IS CODE =  81
------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.066
   *USER SPECIFIED(SUBAREA):
   STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.3770
   SUBAREA AREA(ACRES) =    1.61   SUBAREA RUNOFF(CFS) =    7.34
   TOTAL AREA(ACRES) =         32.8    TOTAL RUNOFF(CFS) =      62.70
   TC(MIN.) =     9.96

*****************************************************************************
   FLOW PROCESS FROM NODE  1504.00 TO NODE  1505.00 IS CODE =  81
------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.066
   *USER SPECIFIED(SUBAREA):
   STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
```

```
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3909
 SUBAREA AREA(ACRES) =    0.90   SUBAREA RUNOFF(CFS) =    4.10
 TOTAL AREA(ACRES) =       33.7   TOTAL RUNOFF(CFS) =      66.81
 TC(MIN.) =    9.96

*******************************************************************************
  FLOW PROCESS FROM NODE   1505.00 TO NODE   1505.00 IS CODE =  10
-------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
===============================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    803.00
 DOWNSTREAM ELEVATION(FEET) =    800.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.361
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.275
 SUBAREA RUNOFF(CFS) =      0.24
 TOTAL AREA(ACRES) =       0.13   TOTAL RUNOFF(CFS) =       0.24

*******************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    503.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    665.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   939.00   CHANNEL SLOPE = 0.1438
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    4.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.506
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.05
 AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   2.59
 Tc(MIN.) =   11.95
 SUBAREA AREA(ACRES) =    12.61       SUBAREA RUNOFF(CFS) =   19.89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =        12.7       PEAK FLOW RATE(CFS) =      20.09

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   FLOW VELOCITY(FEET/SEC.) =   7.58
 LONGEST FLOWPATH FROM NODE    501.00 TO NODE    503.00 =    1039.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    503.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.506
 *USER SPECIFIED(SUBAREA):
 TURF GOOD COVER RUNOFF COEFFICIENT = .5500
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3644
 SUBAREA AREA(ACRES) =    0.99   SUBAREA RUNOFF(CFS) =    2.45
 TOTAL AREA(ACRES) =        13.7   TOTAL RUNOFF(CFS) =       22.55
 TC(MIN.) =   11.95

*******************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    504.00 IS CODE =  31
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   665.00  DOWNSTREAM(FEET) =   640.00
  FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 14.77
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       22.55
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   12.51
  LONGEST FLOWPATH FROM NODE   501.00 TO NODE   504.00 =   1539.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   504.00 TO NODE   504.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.51
  RAINFALL INTENSITY(INCH/HR) =   4.37
  TOTAL STREAM AREA(ACRES) =   13.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.55

********************************************************************************
  FLOW PROCESS FROM NODE   505.00 TO NODE   506.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   697.00
  DOWNSTREAM ELEVATION(FEET) =   695.00
  ELEVATION DIFFERENCE(FEET) =    2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.64

********************************************************************************
  FLOW PROCESS FROM NODE   506.00 TO NODE   504.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 695.00  DOWNSTREAM ELEVATION(FEET) =  650.00
  STREET LENGTH(FEET) =   850.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.68
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.43
```

```
   STREET FLOW TRAVEL TIME(MIN.) =   2.96   Tc(MIN.) =   10.32
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.953
   RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  85
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.491
   SUBAREA AREA(ACRES) =    6.27       SUBAREA RUNOFF(CFS) =   15.22
   TOTAL AREA(ACRES) =        6.5         PEAK FLOW RATE(CFS) =      15.73

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.38
   FLOW VELOCITY(FEET/SEC.) = 5.56   DEPTH*VELOCITY(FT*FT/SEC.) =  1.97
   LONGEST FLOWPATH FROM NODE   505.00 TO NODE   504.00 =   945.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   504.00 TO NODE   504.00 IS CODE =   1
----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   10.32
   RAINFALL INTENSITY(INCH/HR) =  4.95
   TOTAL STREAM AREA(ACRES) =     6.47
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.73

   ** CONFLUENCE DATA **
   STREAM     RUNOFF      Tc      INTENSITY      AREA
   NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       22.55     12.51       4.374        13.73
      2       15.73     10.32       4.953         6.47

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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF      Tc      INTENSITY
   NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       34.33     10.32       4.953
      2       36.44     12.51       4.374

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      36.44   Tc(MIN.) =   12.51
   TOTAL AREA(ACRES) =        20.2
   LONGEST FLOWPATH FROM NODE   501.00 TO NODE   504.00 =   1539.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   504.00 TO NODE   507.00 IS CODE =  31
----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   650.00  DOWNSTREAM(FEET) =   640.00
   FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.6 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 16.84
   ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      36.44
   PIPE TRAVEL TIME(MIN.) =   0.21   Tc(MIN.) =   12.72
   LONGEST FLOWPATH FROM NODE   501.00 TO NODE   507.00 =   1749.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   504.00 TO NODE   507.00 IS CODE =  81
----------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.328
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
```

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 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4208
 SUBAREA AREA(ACRES) =    3.22   SUBAREA RUNOFF(CFS) =    7.25
 TOTAL AREA(ACRES) =        23.4   TOTAL RUNOFF(CFS) =      42.65
 TC(MIN.) =   12.72

 ******************************************************************************
  FLOW PROCESS FROM NODE   507.00 TO NODE    507.00 IS CODE =   1
 ------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 ==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.72
  RAINFALL INTENSITY(INCH/HR) =   4.33
  TOTAL STREAM AREA(ACRES) =    23.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.65

 ******************************************************************************
  FLOW PROCESS FROM NODE   508.00 TO NODE    509.00 IS CODE =   21
 ------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ==============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
  UPSTREAM ELEVATION(FEET) =   660.00
  DOWNSTREAM ELEVATION(FEET) =   658.00
  ELEVATION DIFFERENCE(FEET) =    2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =     0.51
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.51

 ******************************************************************************
  FLOW PROCESS FROM NODE   509.00 TO NODE    507.00 IS CODE =   62
 ------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 ==============================================================================
  UPSTREAM ELEVATION(FEET) = 658.00  DOWNSTREAM ELEVATION(FEET) =  640.00
  STREET LENGTH(FEET) =   886.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL) =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.98
  STREET FLOW TRAVEL TIME(MIN.) =   4.76   Tc(MIN.) =   12.12
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.466
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
  SUBAREA AREA(ACRES) =    4.93      SUBAREA RUNOFF(CFS) =   11.45
  TOTAL AREA(ACRES) =        5.1      PEAK FLOW RATE(CFS) =      11.82
```

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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.34
  FLOW VELOCITY(FEET/SEC.) =  3.60   DEPTH*VELOCITY(FT*FT/SEC.) =   1.34
  LONGEST FLOWPATH FROM NODE    508.00 TO NODE    507.00 =    981.00 FEET.


***************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    507.00 IS CODE =   1
---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.12
  RAINFALL INTENSITY(INCH/HR) =   4.47
  TOTAL STREAM AREA(ACRES) =     5.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.82

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
      1      42.65     12.72        4.328        23.42
      2      11.82     12.12        4.466         5.09

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       53.15     12.12       4.466
     2       54.11     12.72       4.328

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      54.11   Tc(MIN.) =   12.72
  TOTAL AREA(ACRES) =        28.5
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    507.00 =   1749.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    510.00 IS CODE =  31
---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   640.00  DOWNSTREAM(FEET) =   622.00
  FLOW LENGTH(FEET) =   540.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.80
  ESTIMATED PIPE DIAMETER(INCH) = 27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      54.11
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   13.29
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    510.00 =   2289.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    510.00 IS CODE =  81
---------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.208
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4481
  SUBAREA AREA(ACRES) =    3.82   SUBAREA RUNOFF(CFS) =    8.36
  TOTAL AREA(ACRES) =        32.3   TOTAL RUNOFF(CFS) =      60.96
  TC(MIN.) =   13.29

***************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    511.00 IS CODE =  31
---------------------------------------------------------------------------
```

253

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   622.00  DOWNSTREAM(FEET) =   600.00
  FLOW LENGTH(FEET) = 1145.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 13.51
  ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.96
  PIPE TRAVEL TIME(MIN.) =   1.41   Tc(MIN.) =   14.70
  LONGEST FLOWPATH FROM NODE   501.00 TO NODE   511.00 =   3434.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   510.00 TO NODE   511.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.942
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4866
  SUBAREA AREA(ACRES) =    3.97   SUBAREA RUNOFF(CFS) =   12.52
  TOTAL AREA(ACRES) =        36.3   TOTAL RUNOFF(CFS) =      69.63
  TC(MIN.) =   14.70

*******************************************************************************
  FLOW PROCESS FROM NODE   510.00 TO NODE   511.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.942
  *USER SPECIFIED(SUBAREA):
  TURF GOOD COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4888
  SUBAREA AREA(ACRES) =    1.32   SUBAREA RUNOFF(CFS) =    2.86
  TOTAL AREA(ACRES) =        37.6   TOTAL RUNOFF(CFS) =      72.49
  TC(MIN.) =   14.70

*******************************************************************************
  FLOW PROCESS FROM NODE   511.00 TO NODE   512.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   600.00  DOWNSTREAM(FEET) =   586.00
  FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 18.22
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      72.49
  PIPE TRAVEL TIME(MIN.) =   0.33   Tc(MIN.) =   15.03
  LONGEST FLOWPATH FROM NODE   501.00 TO NODE   512.00 =   3794.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   512.00 TO NODE   512.00 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.) =   15.03
  RAINFALL INTENSITY(INCH/HR) =   3.89
  TOTAL STREAM AREA(ACRES) =    37.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      72.49

*******************************************************************************
  FLOW PROCESS FROM NODE   513.00 TO NODE   514.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    635.00
  DOWNSTREAM ELEVATION(FEET) =    633.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =      1.09
  TOTAL AREA(ACRES) =        0.34    TOTAL RUNOFF(CFS) =      1.09

*******************************************************************************
  FLOW PROCESS FROM NODE    514.00 TO NODE    512.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 633.00  DOWNSTREAM ELEVATION(FEET) =  586.00
  STREET LENGTH(FEET) =  995.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.29
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.82
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.55
  STREET FLOW TRAVEL TIME(MIN.) =   3.44   Tc(MIN.) =   10.80
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.811
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.568
  SUBAREA AREA(ACRES) =     6.67       SUBAREA RUNOFF(CFS) =   18.29
  TOTAL AREA(ACRES) =         7.0        PEAK FLOW RATE(CFS) =      19.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) = 12.66
  FLOW VELOCITY(FEET/SEC.) = 5.56   DEPTH*VELOCITY(FT*FT/SEC.) =   2.11
  LONGEST FLOWPATH FROM NODE    513.00 TO NODE    512.00 =   1090.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    512.00 TO NODE    512.00 IS CODE =    1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.80
  RAINFALL INTENSITY(INCH/HR) =   4.81
  TOTAL STREAM AREA(ACRES) =     7.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.14

*******************************************************************************
  FLOW PROCESS FROM NODE    515.00 TO NODE    516.00 IS CODE =  21
-------------------------------------------------------------------------------
```

```
      >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    613.00
  DOWNSTREAM ELEVATION(FEET) =    611.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.161
  SUBAREA RUNOFF(CFS) =      0.99
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =       0.99

********************************************************************************
  FLOW PROCESS FROM NODE   516.00 TO NODE   512.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 611.00  DOWNSTREAM ELEVATION(FEET) = 586.00
  STREET LENGTH(FEET) =  790.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =     9.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.27
  STREET FLOW TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =   10.68
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.844
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  87
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.567
  SUBAREA AREA(ACRES) =    5.38      SUBAREA RUNOFF(CFS) =   14.86
  TOTAL AREA(ACRES) =        5.7       PEAK FLOW RATE(CFS) =     15.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) = 12.66
  FLOW VELOCITY(FEET/SEC.) = 4.55   DEPTH*VELOCITY(FT*FT/SEC.) =  1.72
  LONGEST FLOWPATH FROM NODE   515.00 TO NODE   512.00 =    885.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   512.00 TO NODE   512.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.68
  RAINFALL INTENSITY(INCH/HR) =   4.84
  TOTAL STREAM AREA(ACRES) =    5.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    15.64

  ** CONFLUENCE DATA **
```

```
       STREAM    RUNOFF      Tc      INTENSITY      AREA
       NUMBER    (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
          1      72.49     15.03      3.886         37.62
          2      19.14     10.80      4.811          7.01
          3      15.64     10.68      4.844          5.69


    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      92.73     10.68      4.844
       2      93.23     10.80      4.811
       3     100.50     15.03      3.886

    COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
    PEAK FLOW RATE(CFS) =     100.50   Tc(MIN.) =   15.03
    TOTAL AREA(ACRES) =        50.3
    LONGEST FLOWPATH FROM NODE    501.00 TO NODE    512.00 =    3794.00 FEET.

****************************************************************************
    FLOW PROCESS FROM NODE    512.00 TO NODE    517.00 IS CODE =  31
----------------------------------------------------------------------------
    >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    586.00  DOWNSTREAM(FEET) =   575.00
    FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
    DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.0 INCHES
    PIPE-FLOW VELOCITY(FEET/SEC.) =  22.76
    ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
    PIPE-FLOW(CFS) =     100.50
    PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   15.18
    LONGEST FLOWPATH FROM NODE    501.00 TO NODE    517.00 =    3994.00 FEET.

****************************************************************************
    FLOW PROCESS FROM NODE    512.00 TO NODE    517.00 IS CODE =  81
----------------------------------------------------------------------------
    >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.862
    RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
    SOIL CLASSIFICATION IS "D"
    S.C.S. CURVE NUMBER (AMC II) =  86
    AREA-AVERAGE RUNOFF COEFFICIENT = 0.5101
    SUBAREA AREA(ACRES) =    7.31   SUBAREA RUNOFF(CFS) =   14.68
    TOTAL AREA(ACRES) =        57.6   TOTAL RUNOFF(CFS) =     113.53
    TC(MIN.) =   15.18

****************************************************************************
    FLOW PROCESS FROM NODE    517.00 TO NODE    518.00 IS CODE =  31
----------------------------------------------------------------------------
    >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    575.00  DOWNSTREAM(FEET) =   560.00
    FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
    DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.8 INCHES
    PIPE-FLOW VELOCITY(FEET/SEC.) =  20.97
    ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
    PIPE-FLOW(CFS) =     113.53
    PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   15.47
    LONGEST FLOWPATH FROM NODE    501.00 TO NODE    518.00 =    4359.00 FEET.

****************************************************************************
    FLOW PROCESS FROM NODE    517.00 TO NODE    518.00 IS CODE =  81
----------------------------------------------------------------------------
    >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.815
```

```
    RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
    SOIL CLASSIFICATION IS "D"
    S.C.S. CURVE NUMBER (AMC II) =  86
    AREA-AVERAGE RUNOFF COEFFICIENT = 0.5112
    SUBAREA AREA(ACRES) =   7.01   SUBAREA RUNOFF(CFS) =   13.91
    TOTAL AREA(ACRES) =       64.6   TOTAL RUNOFF(CFS) =      126.06
    TC(MIN.) =   15.47

******************************************************************************
  FLOW PROCESS FROM NODE   518.00 TO NODE    519.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   560.00 DOWNSTREAM(FEET) =    540.00
  FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 23.66
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    126.06
  PIPE TRAVEL TIME(MIN.) =   0.27   Tc(MIN.) =   15.74
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    519.00 =    4739.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   518.00 TO NODE    519.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.773
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5118
  SUBAREA AREA(ACRES) =    4.63   SUBAREA RUNOFF(CFS) =    9.08
  TOTAL AREA(ACRES) =        69.3   TOTAL RUNOFF(CFS) =      133.76
  TC(MIN.) =   15.74

******************************************************************************
  FLOW PROCESS FROM NODE   519.00 TO NODE    519.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.74
  RAINFALL INTENSITY(INCH/HR) =   3.77
  TOTAL STREAM AREA(ACRES) =    69.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    133.76

******************************************************************************
  FLOW PROCESS FROM NODE   520.00 TO NODE    521.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    588.00
  DOWNSTREAM ELEVATION(FEET) =   586.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =     1.03
  TOTAL AREA(ACRES) =       0.32   TOTAL RUNOFF(CFS) =       1.03

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

```
 FLOW PROCESS FROM NODE    521.00 TO NODE    519.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =  586.00  DOWNSTREAM ELEVATION(FEET) =  540.00
  STREET LENGTH(FEET) =  1260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) =  28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL) =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   10.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   4.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.55
  STREET FLOW TRAVEL TIME(MIN.) =   4.70   Tc(MIN.) =   12.05
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.481
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    9.11      SUBAREA RUNOFF(CFS) =    21.23
  TOTAL AREA(ACRES) =         9.4        PEAK FLOW RATE(CFS) =      21.97

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.09
  FLOW VELOCITY(FEET/SEC.) =  5.22   DEPTH*VELOCITY(FT*FT/SEC.) =  2.13
  LONGEST FLOWPATH FROM NODE    520.00 TO NODE    519.00 =   1355.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    519.00 TO NODE    519.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.05
  RAINFALL INTENSITY(INCH/HR) =   4.48
  TOTAL STREAM AREA(ACRES) =    9.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    21.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      133.76    15.74       3.773        69.27
     2       21.97    12.05       4.481         9.43

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      134.61    12.05       4.481
     2      152.26    15.74       3.773

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      152.26   Tc(MIN.) =   15.74
  TOTAL AREA(ACRES) =         78.7
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    519.00 =    4739.00 FEET.
```

```
*****************************************************************************
  FLOW PROCESS FROM NODE    519.00 TO NODE    520.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    540.00  DOWNSTREAM(FEET) =    523.00
  FLOW LENGTH(FEET) =    760.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.96
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     152.26
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   16.44
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    520.00 =    5499.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    519.00 TO NODE    523.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.668
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5134
  SUBAREA AREA(ACRES) =    7.98   SUBAREA RUNOFF(CFS) =   15.22
  TOTAL AREA(ACRES) =        86.7   TOTAL RUNOFF(CFS) =      163.23
  TC(MIN.) =   16.44

*****************************************************************************
  FLOW PROCESS FROM NODE    523.00 TO NODE    524.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.00  DOWNSTREAM(FEET) =    510.00
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  35.30
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     163.23
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   16.49
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    524.00 =    5599.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    523.00 TO NODE    524.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.661
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5116
  SUBAREA AREA(ACRES) =    0.95   SUBAREA RUNOFF(CFS) =    1.22
  TOTAL AREA(ACRES) =        87.6   TOTAL RUNOFF(CFS) =      164.15
  TC(MIN.) =   16.49

*****************************************************************************
  FLOW PROCESS FROM NODE    524.00 TO NODE    524.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.49
  RAINFALL INTENSITY(INCH/HR) =   3.66
  TOTAL STREAM AREA(ACRES) =    87.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    164.15

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

```
  FLOW PROCESS FROM NODE    525.00 TO NODE    526.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    557.00
  DOWNSTREAM ELEVATION(FEET) =    555.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =       0.61
  TOTAL AREA(ACRES) =       0.19   TOTAL RUNOFF(CFS) =       0.61

********************************************************************************
  FLOW PROCESS FROM NODE    526.00 TO NODE    527.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 555.00  DOWNSTREAM ELEVATION(FEET) = 540.00
  STREET LENGTH(FEET) =    470.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =     8.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
  STREET FLOW TRAVEL TIME(MIN.) =   2.09   Tc(MIN.) =    9.44
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.245
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =     4.49       SUBAREA RUNOFF(CFS) =   12.25
  TOTAL AREA(ACRES) =        4.7       PEAK FLOW RATE(CFS) =      12.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.63
  FLOW VELOCITY(FEET/SEC.) =  4.34   DEPTH*VELOCITY(FT*FT/SEC.) =  1.56
  LONGEST FLOWPATH FROM NODE    525.00 TO NODE    527.00 =     565.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    527.00 TO NODE    524.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    540.00  DOWNSTREAM(FEET) =    510.00
  FLOW LENGTH(FEET) =    260.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 18.16
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
```

```
     PIPE-FLOW(CFS) =      12.76
     PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    9.68
     LONGEST FLOWPATH FROM NODE   525.00 TO NODE    524.00 =     825.00 FEET.

 *****************************************************************************
   FLOW PROCESS FROM NODE   524.00 TO NODE    524.00 IS CODE =   1
 -----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 =============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   9.68
   RAINFALL INTENSITY(INCH/HR) =   5.16
   TOTAL STREAM AREA(ACRES) =     4.68
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.76

   ** CONFLUENCE DATA **
   STREAM    RUNOFF      Tc      INTENSITY      AREA
   NUMBER     (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      164.15    16.49       3.661        87.63
      2       12.76     9.68       5.161         4.68

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

   ** PEAK FLOW RATE TABLE **
   STREAM    RUNOFF      Tc      INTENSITY
   NUMBER     (CFS)    (MIN.)   (INCH/HOUR)
      1      129.20     9.68       5.161
      2      173.20    16.49       3.661

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      173.20   Tc(MIN.) =   16.49
   TOTAL AREA(ACRES) =        92.3
   LONGEST FLOWPATH FROM NODE    501.00 TO NODE    524.00 =    5599.00 FEET.


 +---------------------------------------------------------------------------+
 | Discharge at Basin #5.                                                     |
 |                                                                           |
 |                                                                           |
 +---------------------------------------------------------------------------+

 *****************************************************************************
   FLOW PROCESS FROM NODE   524.00 TO NODE    528.00 IS CODE =  31
 -----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   510.00  DOWNSTREAM(FEET) =   500.00
   FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.3 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  29.05
   ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      173.20
   PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   16.56
   LONGEST FLOWPATH FROM NODE    501.00 TO NODE    528.00 =    5729.00 FEET.

 *****************************************************************************
   FLOW PROCESS FROM NODE   524.00 TO NODE    528.00 IS CODE =  81
 -----------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =============================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.651
   *USER SPECIFIED(SUBAREA):
   TURF GOOD COVER RUNOFF COEFFICIENT = .5500
   S.C.S. CURVE NUMBER (AMC II) = 86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.5127
   SUBAREA AREA(ACRES) =    1.68   SUBAREA RUNOFF(CFS) =    3.37
   TOTAL AREA(ACRES) =        94.0   TOTAL RUNOFF(CFS) =     175.93
   TC(MIN.) =   16.56
```

```
******************************************************************************
  FLOW PROCESS FROM NODE    524.00 TO NODE     528.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.651
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5154
  SUBAREA AREA(ACRES) =    0.65   SUBAREA RUNOFF(CFS) =    2.14
  TOTAL AREA(ACRES) =         94.6   TOTAL RUNOFF(CFS) =      178.07
  TC(MIN.) =   16.56

******************************************************************************
  FLOW PROCESS FROM NODE    528.00 TO NODE     529.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    500.00  DOWNSTREAM(FEET) =    495.00
  FLOW LENGTH(FEET) =    690.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  44.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.10
  ESTIMATED PIPE DIAMETER(INCH) = 57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     178.07
  PIPE TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =   17.51
  LONGEST FLOWPATH FROM NODE    501.00 TO NODE    529.00 =   6419.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    528.00 TO NODE     529.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.521
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5190
  SUBAREA AREA(ACRES) =    0.89   SUBAREA RUNOFF(CFS) =    2.82
  TOTAL AREA(ACRES) =         95.5   TOTAL RUNOFF(CFS) =      178.07
  TC(MIN.) =   17.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

******************************************************************************
  FLOW PROCESS FROM NODE    528.00 TO NODE     529.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.521
  *USER SPECIFIED(SUBAREA):
  TURF GOOD COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5192
  SUBAREA AREA(ACRES) =    0.60   SUBAREA RUNOFF(CFS) =    1.16
  TOTAL AREA(ACRES) =         96.1   TOTAL RUNOFF(CFS) =      178.07
  TC(MIN.) =   17.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

******************************************************************************
  FLOW PROCESS FROM NODE    529.00 TO NODE   1505.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    495.00  DOWNSTREAM(FEET) =    490.00
  FLOW LENGTH(FEET) =    560.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  43.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.98
  ESTIMATED PIPE DIAMETER(INCH) = 54.00    NUMBER OF PIPES =   1
```

```
   PIPE-FLOW(CFS) =     178.07
   PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   18.23
   LONGEST FLOWPATH FROM NODE   501.00 TO NODE  1505.00 =   6979.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE  1505.00 TO NODE  1505.00 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      178.07    18.23       3.431      96.13
  LONGEST FLOWPATH FROM NODE   501.00 TO NODE  1505.00 =   6979.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM    RUNOFF      Tc      INTENSITY    AREA
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)  (ACRE)
     1       66.81     9.96       5.066      33.73
  LONGEST FLOWPATH FROM NODE  1501.00 TO NODE  1505.00 =   1825.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
     1      164.12     9.96       5.066
     2      223.31    18.23       3.431

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     223.31   Tc(MIN.) =   18.23
  TOTAL AREA(ACRES) =     129.9

****************************************************************************
  FLOW PROCESS FROM NODE  1505.00 TO NODE  1505.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  1505.00 TO NODE  1506.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   490.00  DOWNSTREAM(FEET) =   485.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 34.60
  ESTIMATED PIPE DIAMETER(INCH) = 39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     223.31
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   18.26
  LONGEST FLOWPATH FROM NODE   501.00 TO NODE  1506.00 =   7029.00 FEET.

+--------------------------------------------------------------------------+
| Discharge at Culvert #16.                                                |
|                                                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE  1601.00 TO NODE  1602.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1665.00
  DOWNSTREAM ELEVATION(FEET) =   1655.00
  ELEVATION DIFFERENCE(FEET) =     10.00
```

```
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
 SUBAREA RUNOFF(CFS) =      0.19
 TOTAL AREA(ACRES) =       0.08   TOTAL RUNOFF(CFS) =      0.19


****************************************************************************
  FLOW PROCESS FROM NODE   1602.00 TO NODE   1603.00 IS CODE =  51
 ---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1655.00  DOWNSTREAM(FEET) =   1240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1035.00   CHANNEL SLOPE =  0.4010
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  1.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.953
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     20.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.55
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.49
  Tc(MIN.) =     7.76
  SUBAREA AREA(ACRES) =     19.35       SUBAREA RUNOFF(CFS) =    40.32
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        19.4        PEAK FLOW RATE(CFS) =     40.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48    FLOW VELOCITY(FEET/SEC.) = 14.82
  LONGEST FLOWPATH FROM NODE   1601.00 TO NODE   1603.00 =    1135.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1604.00 IS CODE =  51
 ---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1240.00  DOWNSTREAM(FEET) =   1180.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  376.00   CHANNEL SLOPE =  0.1596
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.672
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     61.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.39
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   0.60
  Tc(MIN.) =     8.36
  SUBAREA AREA(ACRES) =     21.43       SUBAREA RUNOFF(CFS) =    42.55
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        40.9        PEAK FLOW RATE(CFS) =     81.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63    FLOW VELOCITY(FEET/SEC.) = 11.43
  LONGEST FLOWPATH FROM NODE   1601.00 TO NODE   1604.00 =    1511.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE   1604.00 TO NODE   1605.00 IS CODE =  51
 ---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1180.00  DOWNSTREAM(FEET) =   1140.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  331.00   CHANNEL SLOPE =  0.1208
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =  2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.432
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
```

```
   S.C.S. CURVE NUMBER (AMC II) =  86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     88.76
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.49
   AVERAGE FLOW DEPTH(FEET) =   0.57    TRAVEL TIME(MIN.) =   0.58
   Tc(MIN.) =     8.94
   SUBAREA AREA(ACRES) =      8.03       SUBAREA RUNOFF(CFS) =   15.27
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =       48.9        PEAK FLOW RATE(CFS) =      92.95

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.58   FLOW VELOCITY(FEET/SEC.) =   9.66
   LONGEST FLOWPATH FROM NODE   1601.00 TO NODE   1605.00 =   1842.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1605.00 TO NODE   1606.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1140.00  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   235.00   CHANNEL SLOPE =  0.1702
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.308
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.07
  AVERAGE FLOW DEPTH(FEET) =   0.63    TRAVEL TIME(MIN.) =   0.32
  Tc(MIN.) =     9.27
  SUBAREA AREA(ACRES) =     35.75       SUBAREA RUNOFF(CFS) =   66.42
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        84.6        PEAK FLOW RATE(CFS) =     157.26

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.72   FLOW VELOCITY(FEET/SEC.) =  13.00
   LONGEST FLOWPATH FROM NODE   1601.00 TO NODE   1606.00 =   2077.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1606.00 TO NODE   1606.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   5.31
  TOTAL STREAM AREA(ACRES) =    84.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    157.26

*****************************************************************************
  FLOW PROCESS FROM NODE   1607.00 TO NODE   1608.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1705.00
  DOWNSTREAM ELEVATION(FEET) =   1695.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.833
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.14

*****************************************************************************
  FLOW PROCESS FROM NODE   1608.00 TO NODE   1609.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1695.00  DOWNSTREAM(FEET) =   1340.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1285.00   CHANNEL SLOPE =  0.2763
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.679
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       21.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.29
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =    8.35
  SUBAREA AREA(ACRES) =    21.20       SUBAREA RUNOFF(CFS) =   42.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        21.3       PEAK FLOW RATE(CFS) =      42.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =  12.96
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1609.00 =   1385.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1609.00 TO NODE   1606.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1173.00   CHANNEL SLOPE =  0.2046
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.038
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       66.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.47
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =   10.05
  SUBAREA AREA(ACRES) =    26.96       SUBAREA RUNOFF(CFS) =   47.54
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        48.2       PEAK FLOW RATE(CFS) =      85.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =  12.66
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1606.00 =   2558.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1606.00 TO NODE   1606.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.05
  RAINFALL INTENSITY(INCH/HR) =   5.04
  TOTAL STREAM AREA(ACRES) =   48.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      85.03

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       157.26     9.27       5.308        84.64
     2        85.03    10.05       5.038        48.22

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

```
 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF    Tc     INTENSITY
 NUMBER    (CFS)    (MIN.)  (INCH/HOUR)
    1      235.66    9.27     5.308
    2      234.27   10.05     5.038

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     235.66   Tc(MIN.) =    9.27
 TOTAL AREA(ACRES) =      132.9
 LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1606.00 =   2558.00 FEET.

*******************************************************************************
 FLOW PROCESS FROM NODE   1606.00 TO NODE   1610.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1060.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   329.00   CHANNEL SLOPE =  0.1216
 CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.500
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.167
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    255.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.81
 AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   0.40
 Tc(MIN.) =    9.67
 SUBAREA AREA(ACRES) =    22.04       SUBAREA RUNOFF(CFS) =   39.86
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =      154.9        PEAK FLOW RATE(CFS) =     280.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.11   FLOW VELOCITY(FEET/SEC.) = 14.21
 LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1610.00 =   2887.00 FEET.

*******************************************************************************
 FLOW PROCESS FROM NODE   1610.00 TO NODE   1611.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1060.00  DOWNSTREAM(FEET) =   1030.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE =  0.1071
 CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.057
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    305.87
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.30
 AVERAGE FLOW DEPTH(FEET) =   1.23   TRAVEL TIME(MIN.) =   0.33
 Tc(MIN.) =    9.99
 SUBAREA AREA(ACRES) =    29.10       SUBAREA RUNOFF(CFS) =   51.51
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =      184.0        PEAK FLOW RATE(CFS) =     325.69

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.27   FLOW VELOCITY(FEET/SEC.) = 14.60
 LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1611.00 =   3167.00 FEET.

*******************************************************************************
 FLOW PROCESS FROM NODE   1611.00 TO NODE   1612.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    955.00
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```
     CHANNEL LENGTH THRU SUBAREA(FEET) =   722.00   CHANNEL SLOPE =  0.1039
     CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
     MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
      100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.807
     *USER SPECIFIED(SUBAREA):
     ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
     S.C.S. CURVE NUMBER (AMC II) =  86
     TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    343.70
     TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.73
     AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   0.82
     Tc(MIN.) =   10.81
     SUBAREA AREA(ACRES) =    21.41      SUBAREA RUNOFF(CFS) =   36.02
     AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
     TOTAL AREA(ACRES) =       205.4        PEAK FLOW RATE(CFS) =     345.61

     END OF SUBAREA CHANNEL FLOW HYDRAULICS:
     DEPTH(FEET) = 1.32   FLOW VELOCITY(FEET/SEC.) = 14.78
     LONGEST FLOWPATH FROM NODE  1607.00 TO NODE  1612.00 =   3889.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE  1612.00 TO NODE  1613.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   363.00   CHANNEL SLOPE =  0.0964
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.693
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    372.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.74
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   0.41
  Tc(MIN.) =   11.22
  SUBAREA AREA(ACRES) =    32.46      SUBAREA RUNOFF(CFS) =   53.32
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       237.9        PEAK FLOW RATE(CFS) =     390.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.45   FLOW VELOCITY(FEET/SEC.) = 15.00
  LONGEST FLOWPATH FROM NODE  1607.00 TO NODE  1613.00 =   4252.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE  1613.00 TO NODE  1614.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    920.00  DOWNSTREAM(FEET) =    870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   522.00   CHANNEL SLOPE =  0.0958
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.544
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    404.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.16
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   0.57
  Tc(MIN.) =   11.79
  SUBAREA AREA(ACRES) =    17.20      SUBAREA RUNOFF(CFS) =   27.36
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       255.1        PEAK FLOW RATE(CFS) =     405.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.49   FLOW VELOCITY(FEET/SEC.) = 15.14
  LONGEST FLOWPATH FROM NODE  1607.00 TO NODE  1614.00 =   4774.00 FEET.
```

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*****************************************************************************
  FLOW PROCESS FROM NODE   1614.00 TO NODE   1615.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   837.00   CHANNEL SLOPE =  0.0836
  CHANNEL BASE(FEET) =  15.00   "Z" FACTOR =    2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.324
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    426.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.73
  AVERAGE FLOW DEPTH(FEET) =   1.59   TRAVEL TIME(MIN.) =   0.95
  Tc(MIN.) =   12.74
  SUBAREA AREA(ACRES) =     27.25       SUBAREA RUNOFF(CFS) =   41.24
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      282.3        PEAK FLOW RATE(CFS) =    427.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.60   FLOW VELOCITY(FEET/SEC.) = 14.70
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1615.00 =   5611.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1615.00 TO NODE   1616.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    735.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1087.00   CHANNEL SLOPE =  0.0598
  CHANNEL BASE(FEET) =  30.00   "Z" FACTOR =    3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.997
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    449.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.98
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =   14.39
  SUBAREA AREA(ACRES) =     31.43       SUBAREA RUNOFF(CFS) =   43.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =      313.8        PEAK FLOW RATE(CFS) =    438.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.20   FLOW VELOCITY(FEET/SEC.) = 10.88
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1616.00 =   6698.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1616.00 TO NODE   1617.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.00   CHANNEL SLOPE =  0.0546
  CHANNEL BASE(FEET) =  50.00   "Z" FACTOR =    3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.676
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    460.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.18
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   16.38
  SUBAREA AREA(ACRES) =     33.67       SUBAREA RUNOFF(CFS) =   43.32
```

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  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       347.4          PEAK FLOW RATE(CFS) =     447.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.93   FLOW VELOCITY(FEET/SEC.) =  9.13
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1617.00 =   7796.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1617.00 TO NODE   1618.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    675.00  DOWNSTREAM(FEET) =     640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  805.00   CHANNEL SLOPE =  0.0435
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =    5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.498
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    460.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.23
  AVERAGE FLOW DEPTH(FEET) =  1.61   TRAVEL TIME(MIN.) =   1.31
  Tc(MIN.) =   17.69
  SUBAREA AREA(ACRES) =    22.48       SUBAREA RUNOFF(CFS) =   27.52
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       369.9          PEAK FLOW RATE(CFS) =     452.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 1.59   FLOW VELOCITY(FEET/SEC.) =  10.18
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1618.00 =   8601.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1618.00 TO NODE   1618.00 IS CODE =  10
-----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   1619.00 TO NODE   1620.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1953.00
  DOWNSTREAM ELEVATION(FEET) =   1945.00
  ELEVATION DIFFERENCE(FEET) =     8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.750
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.513
  SUBAREA RUNOFF(CFS) =     0.23
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.23

*****************************************************************************
  FLOW PROCESS FROM NODE   1620.00 TO NODE   1621.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1945.00  DOWNSTREAM(FEET) =   1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 2581.00   CHANNEL SLOPE =  0.3041
  CHANNEL BASE(FEET) =     5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.785
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.60
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   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.40
   AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   4.14
   Tc(MIN.) =   10.89
   SUBAREA AREA(ACRES) =    22.63     SUBAREA RUNOFF(CFS) =   37.90
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =      22.7      PEAK FLOW RATE(CFS) =      38.06

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.49   FLOW VELOCITY(FEET/SEC.) = 12.90
   LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1621.00 =   2681.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   1621.00 TO NODE   1622.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =   1030.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   476.00   CHANNEL SLOPE = 0.2731
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.609
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.06
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.18
   AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   0.65
   Tc(MIN.) =   11.54
   SUBAREA AREA(ACRES) =    26.02     SUBAREA RUNOFF(CFS) =   41.97
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =       48.8      PEAK FLOW RATE(CFS) =      78.63

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.53   FLOW VELOCITY(FEET/SEC.) = 13.43
   LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1622.00 =   3157.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   1622.00 TO NODE   1622.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   11.54
   RAINFALL INTENSITY(INCH/HR) =   4.61
   TOTAL STREAM AREA(ACRES) =    48.75
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     78.63

*******************************************************************************
   FLOW PROCESS FROM NODE   1623.00 TO NODE   1624.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1953.00
   DOWNSTREAM ELEVATION(FEET) =   1945.00
   ELEVATION DIFFERENCE(FEET) =      8.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   6.750
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.513
   SUBAREA RUNOFF(CFS) =      0.39
   TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.39

*******************************************************************************
   FLOW PROCESS FROM NODE   1624.00 TO NODE   1625.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1945.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1730.00   CHANNEL SLOPE =  0.3728
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.310
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     22.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.46
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =    9.27
  SUBAREA AREA(ACRES) =    23.04       SUBAREA RUNOFF(CFS) =   42.82
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       23.2        PEAK FLOW RATE(CFS) =      43.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   FLOW VELOCITY(FEET/SEC.) = 14.42
  LONGEST FLOWPATH FROM NODE  1623.00 TO NODE  1625.00 =   1830.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  1625.00 TO NODE  1622.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1030.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1178.00   CHANNEL SLOPE =  0.2292
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.771
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     63.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.75
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.67
  Tc(MIN.) =   10.94
  SUBAREA AREA(ACRES) =    24.22       SUBAREA RUNOFF(CFS) =   40.44
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =       47.4        PEAK FLOW RATE(CFS) =      79.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   FLOW VELOCITY(FEET/SEC.) = 12.72
  LONGEST FLOWPATH FROM NODE  1623.00 TO NODE  1622.00 =   3008.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  1622.00 TO NODE  1622.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.94
  RAINFALL INTENSITY(INCH/HR) =   4.77
  TOTAL STREAM AREA(ACRES) =    47.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     79.20

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       78.63     11.54        4.609        48.75
     2       79.20     10.94        4.771        47.43

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

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

```
    NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
       1       153.72    10.94       4.771
       2       155.14    11.54       4.609


   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     155.14   Tc(MIN.) =    11.54
   TOTAL AREA(ACRES) =        96.2
   LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1622.00 =    3157.00 FEET.

******************************************************************************
   FLOW PROCESS FROM NODE   1622.00 TO NODE   1626.00 IS CODE =  51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    1000.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   399.00   CHANNEL SLOPE = 0.0752
   CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =    2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.397
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     172.73
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.64
   AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   0.87
   Tc(MIN.) =   12.41
   SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =   35.18
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =       119.0        PEAK FLOW RATE(CFS) =     183.22

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.57   FLOW VELOCITY(FEET/SEC.) =   7.80
   LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1626.00 =    3556.00 FEET.

******************************************************************************
   FLOW PROCESS FROM NODE   1626.00 TO NODE   1627.00 IS CODE =  51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =     990.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   262.00   CHANNEL SLOPE = 0.0382
   CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =    2.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.252
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     206.91
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.58
   AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   0.66
   Tc(MIN.) =   13.07
   SUBAREA AREA(ACRES) =    31.83       SUBAREA RUNOFF(CFS) =   47.37
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =       150.9        PEAK FLOW RATE(CFS) =     224.54

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.78   FLOW VELOCITY(FEET/SEC.) =   6.83
   LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1627.00 =    3818.00 FEET.

******************************************************************************
   FLOW PROCESS FROM NODE   1627.00 TO NODE   1628.00 IS CODE =  51
------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    990.00  DOWNSTREAM(FEET) =     810.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1054.00   CHANNEL SLOPE = 0.1708
   CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =    2.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.954
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    248.36
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.26
 AVERAGE FLOW DEPTH(FEET) =  0.54   TRAVEL TIME(MIN.) =  1.56
 Tc(MIN.) =  14.63
 SUBAREA AREA(ACRES) =    34.41      SUBAREA RUNOFF(CFS) =   47.62
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =       185.3       PEAK FLOW RATE(CFS) =     256.41

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54   FLOW VELOCITY(FEET/SEC.) = 11.46
 LONGEST FLOWPATH FROM NODE  1619.00 TO NODE  1628.00 =    4872.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1628.00 TO NODE   1629.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    810.00  DOWNSTREAM(FEET) =    780.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1005.00   CHANNEL SLOPE =  0.0299
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.573
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    269.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  6.73
  AVERAGE FLOW DEPTH(FEET) =  0.94   TRAVEL TIME(MIN.) =  2.49
  Tc(MIN.) =  17.12
  SUBAREA AREA(ACRES) =    20.77      SUBAREA RUNOFF(CFS) =   25.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       206.1       PEAK FLOW RATE(CFS) =     257.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.91   FLOW VELOCITY(FEET/SEC.) =  6.61
  LONGEST FLOWPATH FROM NODE  1619.00 TO NODE  1629.00 =    5877.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1629.00 TO NODE   1630.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    780.00  DOWNSTREAM(FEET) =    745.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  735.00   CHANNEL SLOPE =  0.0476
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.378
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    271.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.87
  AVERAGE FLOW DEPTH(FEET) =  0.83   TRAVEL TIME(MIN.) =  1.56
  Tc(MIN.) =  18.68
  SUBAREA AREA(ACRES) =    22.72      SUBAREA RUNOFF(CFS) =   26.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       228.8       PEAK FLOW RATE(CFS) =     270.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   FLOW VELOCITY(FEET/SEC.) =  7.91
  LONGEST FLOWPATH FROM NODE  1619.00 TO NODE  1630.00 =    6612.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1630.00 TO NODE   1618.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    745.00  DOWNSTREAM(FEET) =    640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1126.00   CHANNEL SLOPE = 0.0933
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.187
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    277.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.64
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   1.76
  Tc(MIN.) =   20.44
  SUBAREA AREA(ACRES) =    12.38      SUBAREA RUNOFF(CFS) =   13.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       241.2         PEAK FLOW RATE(CFS) =    270.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) = 10.57
  LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1618.00 =    7738.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1618.00 TO NODE   1618.00 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      270.48     20.44       3.187       241.15
  LONGEST FLOWPATH FROM NODE   1619.00 TO NODE   1618.00 =    7738.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)   (ACRE)
     1      452.88     17.69       3.498       369.90
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1618.00 =    8601.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1      687.00     17.69       3.498
     2      683.09     20.44       3.187

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     687.00   Tc(MIN.) =   17.69
  TOTAL AREA(ACRES) =      611.0

********************************************************************************
  FLOW PROCESS FROM NODE   1618.00 TO NODE   1618.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   1618.00 TO NODE   1631.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    640.00  DOWNSTREAM(FEET) =    595.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1055.00   CHANNEL SLOPE = 0.0427
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.293
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
```

```
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     696.42
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.11
 AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   1.74
 Tc(MIN.) =   19.43
 SUBAREA AREA(ACRES) =    16.34       SUBAREA RUNOFF(CFS) =   18.83
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =      627.4       PEAK FLOW RATE(CFS) =     723.05

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.34   FLOW VELOCITY(FEET/SEC.) = 10.24
 LONGEST FLOWPATH FROM NODE  1607.00 TO NODE  1631.00 =   9656.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE  1631.00 TO NODE  1632.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    595.00  DOWNSTREAM(FEET) =    540.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   877.00   CHANNEL SLOPE = 0.0627
 CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.180
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     731.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.58
 AVERAGE FLOW DEPTH(FEET) =   1.62   TRAVEL TIME(MIN.) =   1.08
 Tc(MIN.) =   20.51
 SUBAREA AREA(ACRES) =    14.81       SUBAREA RUNOFF(CFS) =   16.48
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =      642.2       PEAK FLOW RATE(CFS) =     723.05

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.61   FLOW VELOCITY(FEET/SEC.) = 13.55
 LONGEST FLOWPATH FROM NODE  1607.00 TO NODE  1632.00 =  10533.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE  1632.00 TO NODE  1633.00 IS CODE =  51
-------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    540.00  DOWNSTREAM(FEET) =    520.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE = 0.0741
 CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.500
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.146
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     728.78
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.02
 AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   0.35
 Tc(MIN.) =   20.86
 SUBAREA AREA(ACRES) =    10.40       SUBAREA RUNOFF(CFS) =   11.45
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
 TOTAL AREA(ACRES) =      652.6       PEAK FLOW RATE(CFS) =     723.05

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 1.29   FLOW VELOCITY(FEET/SEC.) = 12.94
 LONGEST FLOWPATH FROM NODE  1607.00 TO NODE  1633.00 =  10803.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE  1633.00 TO NODE  1634.00 IS CODE =  31
-------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    520.00  DOWNSTREAM(FEET) =    505.00
```

```
 FLOW LENGTH(FEET) =   390.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  75.0 INCH PIPE IS  56.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  28.94
 ESTIMATED PIPE DIAMETER(INCH) = 75.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    723.05
 PIPE TRAVEL TIME(MIN.) =   0.22   Tc(MIN.) =   21.08
 LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1634.00 =   11193.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1633.00 TO NODE   1634.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.125
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3544
  SUBAREA AREA(ACRES) =    6.45   SUBAREA RUNOFF(CFS) =   16.12
  TOTAL AREA(ACRES) =      659.1   TOTAL RUNOFF(CFS) =     729.79
  TC(MIN.) =   21.08

*******************************************************************************
  FLOW PROCESS FROM NODE   1634.00 TO NODE   1635.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    505.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   760.00   CHANNEL SLOPE =  0.0197
  CHANNEL BASE(FEET) =   40.00    "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.990
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    734.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   1.48
  Tc(MIN.) =   22.56
  SUBAREA AREA(ACRES) =     8.52       SUBAREA RUNOFF(CFS) =    8.92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.354
  TOTAL AREA(ACRES) =      667.6        PEAK FLOW RATE(CFS) =     729.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   8.52
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1635.00 =   11953.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1635.00 TO NODE   1635.00 IS CODE =  10
-------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
===============================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE   1636.00 TO NODE   1637.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1670.00
  DOWNSTREAM ELEVATION(FEET) =   1665.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.887
  SUBAREA RUNOFF(CFS) =      0.29
  TOTAL AREA(ACRES) =       0.14   TOTAL RUNOFF(CFS) =      0.29
```

```
******************************************************************************
  FLOW PROCESS FROM NODE   1637.00 TO NODE   1638.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.00  DOWNSTREAM(FEET) =   1120.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1553.00   CHANNEL SLOPE = 0.3509
  CHANNEL BASE(FEET) =   5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.055
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     28.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.30
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =   2.11
  Tc(MIN.) =   10.00
  SUBAREA AREA(ACRES) =    31.71      SUBAREA RUNOFF(CFS) =   56.10
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        31.8        PEAK FLOW RATE(CFS) =      56.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   FLOW VELOCITY(FEET/SEC.) = 15.38
  LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1638.00 =   1653.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   1638.00 TO NODE   1639.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1120.00  DOWNSTREAM(FEET) =    740.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1572.00   CHANNEL SLOPE = 0.2417
  CHANNEL BASE(FEET) =  10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.500
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     85.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.26
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =   11.98
  SUBAREA AREA(ACRES) =    36.36      SUBAREA RUNOFF(CFS) =   57.26
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        68.2        PEAK FLOW RATE(CFS) =     107.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   FLOW VELOCITY(FEET/SEC.) = 14.40
  LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1639.00 =   3225.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   1639.00 TO NODE   1640.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    710.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  300.00   CHANNEL SLOPE = 0.1000
  CHANNEL BASE(FEET) =  20.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.377
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    125.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.49
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   0.53
  Tc(MIN.) =   12.50
  SUBAREA AREA(ACRES) =    23.38      SUBAREA RUNOFF(CFS) =   35.81
```

```
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =        91.6          PEAK FLOW RATE(CFS) =     140.30

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   9.90
   LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1640.00 =   3525.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1640.00 TO NODE   1641.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    710.00  DOWNSTREAM(FEET) =    670.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   810.00   CHANNEL SLOPE = 0.0494
   CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   1.500
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.043
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     155.15
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
   AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   1.64
   Tc(MIN.) =   14.14
   SUBAREA AREA(ACRES) =     21.00        SUBAREA RUNOFF(CFS) =   29.71
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =       112.6          PEAK FLOW RATE(CFS) =     159.31

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   8.32
   LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1641.00 =   4335.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1641.00 TO NODE   1642.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    670.00  DOWNSTREAM(FEET) =    645.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   320.00   CHANNEL SLOPE = 0.0781
   CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.942
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     168.96
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.48
   AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   0.56
   Tc(MIN.) =   14.70
   SUBAREA AREA(ACRES) =     13.99        SUBAREA RUNOFF(CFS) =   19.30
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
   TOTAL AREA(ACRES) =       126.6          PEAK FLOW RATE(CFS) =     174.65

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   9.57
   LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1642.00 =   4655.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1642.00 TO NODE    603.00 IS CODE =  31
----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    645.00  DOWNSTREAM(FEET) =    643.00
   FLOW LENGTH(FEET) =   680.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  66.0 INCH PIPE IS  53.2 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   8.52
   ESTIMATED PIPE DIAMETER(INCH) = 66.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      174.65
```

```
  PIPE TRAVEL TIME(MIN.) =   1.33    Tc(MIN.) =    16.03
  LONGEST FLOWPATH FROM NODE   1636.00 TO NODE    603.00 =    5335.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE    603.00 TO NODE    603.00 IS CODE =    1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.03
  RAINFALL INTENSITY(INCH/HR) =   3.73
  TOTAL STREAM AREA(ACRES) =   126.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    174.65


*******************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =   21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    817.00
  DOWNSTREAM ELEVATION(FEET) =    816.00
  ELEVATION DIFFERENCE(FEET) =     1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.157
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.765
  SUBAREA RUNOFF(CFS) =     1.16
  TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      1.16


*******************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    602.10 IS CODE =   61
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =  816.00  DOWNSTREAM ELEVATION(FEET) =  794.00
  STREET LENGTH(FEET) = 1260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0160
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.13
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.56
  STREET FLOW TRAVEL TIME(MIN.) =   5.86   Tc(MIN.) =   14.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.065
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.490
  SUBAREA AREA(ACRES) =   16.69      SUBAREA RUNOFF(CFS) =   33.24
  TOTAL AREA(ACRES) =       17.1      PEAK FLOW RATE(CFS) =      34.06

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  21.00
  FLOW VELOCITY(FEET/SEC.) =  4.18   DEPTH*VELOCITY(FT*FT/SEC.) =   2.19
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1260.0 FT WITH ELEVATION-DROP =  22.0 FT, IS   46.9 CFS,
```

```
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    602.10
   LONGEST FLOWPATH FROM NODE    601.00 TO NODE    602.10 =    1330.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    602.10 TO NODE    602.20 IS CODE =   31
   ------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
   ========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   789.00  DOWNSTREAM(FEET) =   695.00
   FLOW LENGTH(FEET) =   554.00    MANNING'S N =  0.013
   DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.3 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 26.56
   ESTIMATED PIPE DIAMETER(INCH) = 18.00     NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =       34.06
   PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    14.37
   LONGEST FLOWPATH FROM NODE    601.00 TO NODE    602.20 =    1884.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    602.10 TO NODE    602.20 IS CODE =   81
   ------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
   ========================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.001
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .5500
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4981
   SUBAREA AREA(ACRES) =    2.67   SUBAREA RUNOFF(CFS) =    5.88
   TOTAL AREA(ACRES) =        19.8   TOTAL RUNOFF(CFS) =       39.40
   TC(MIN.) =   14.37

****************************************************************************
   FLOW PROCESS FROM NODE    602.20 TO NODE    603.00 IS CODE =   31
   ------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
   ========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   695.00  DOWNSTREAM(FEET) =   643.00
   FLOW LENGTH(FEET) =   251.00    MANNING'S N =  0.013
   DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.7 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 29.57
   ESTIMATED PIPE DIAMETER(INCH) = 18.00     NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =       39.40
   PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    14.51
   LONGEST FLOWPATH FROM NODE    601.00 TO NODE    603.00 =    2135.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    603.00 TO NODE    603.00 IS CODE =    1
   ------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
   ========================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   14.51
   RAINFALL INTENSITY(INCH/HR) =   3.98
   TOTAL STREAM AREA(ACRES) =    19.77
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     39.40

   ** CONFLUENCE DATA **
   STREAM      RUNOFF      Tc        INTENSITY      AREA
   NUMBER      (CFS)      (MIN.)    (INCH/HOUR)    (ACRE)
      1       174.65     16.03        3.728        126.58
      2        39.40     14.51        3.976         19.77

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

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

```
      NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
        1       197.45    14.51      3.976
        2       211.59    16.03      3.728


   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     211.59   Tc(MIN.) =   16.03
   TOTAL AREA(ACRES) =      146.3
   LONGEST FLOWPATH FROM NODE   1636.00 TO NODE    603.00 =   5335.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE    603.00 TO NODE    605.00 IS CODE =  31
-------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   643.00  DOWNSTREAM(FEET) =   550.00
   FLOW LENGTH(FEET) =   940.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.3 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) = 34.16
   ESTIMATED PIPE DIAMETER(INCH) = 39.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =     211.59
   PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   16.49
   LONGEST FLOWPATH FROM NODE   1636.00 TO NODE    605.00 =   6275.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE    605.00 TO NODE    605.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   16.49
   RAINFALL INTENSITY(INCH/HR) =   3.66
   TOTAL STREAM AREA(ACRES) =   146.35
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    211.59

*******************************************************************************
   FLOW PROCESS FROM NODE    604.00 TO NODE    604.10 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
   S.C.S. CURVE NUMBER (AMC II) =  86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
   UPSTREAM ELEVATION(FEET) =    805.00
   DOWNSTREAM ELEVATION(FEET) =    800.00
   ELEVATION DIFFERENCE(FEET) =     5.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.955
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
   NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
   SUBAREA RUNOFF(CFS) =      1.55
   TOTAL AREA(ACRES) =       0.23   TOTAL RUNOFF(CFS) =       1.55

*******************************************************************************
   FLOW PROCESS FROM NODE    604.10 TO NODE    604.20 IS CODE =  31
-------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   795.00  DOWNSTREAM(FEET) =   643.00
   FLOW LENGTH(FEET) =  1445.00   MANNING'S N =  0.013
   ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
   DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.6 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  9.56
   ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      1.55
   PIPE TRAVEL TIME(MIN.) =   2.52    Tc(MIN.) =    4.47
   LONGEST FLOWPATH FROM NODE    604.00 TO NODE    604.20 =    1515.00 FEET.

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

```
  FLOW PROCESS FROM NODE    604.10 TO NODE    604.20 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) = 86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    4.79   SUBAREA RUNOFF(CFS) =   32.18
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =       33.73
  TC(MIN.) =    4.47

*******************************************************************************
  FLOW PROCESS FROM NODE    604.20 TO NODE    605.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    643.00  DOWNSTREAM(FEET) =   550.00
  FLOW LENGTH(FEET) = 1249.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 19.47
  ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.73
  PIPE TRAVEL TIME(MIN.) =   1.07   Tc(MIN.) =    5.54
  LONGEST FLOWPATH FROM NODE    604.00 TO NODE    605.00 =   2764.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    604.20 TO NODE    605.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.396
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) = 86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    3.37   SUBAREA RUNOFF(CFS) =   21.19
  TOTAL AREA(ACRES) =        8.4   TOTAL RUNOFF(CFS) =       52.75
  TC(MIN.) =    5.54

*******************************************************************************
  FLOW PROCESS FROM NODE    605.00 TO NODE    605.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.54
  RAINFALL INTENSITY(INCH/HR) =  7.40
  TOTAL STREAM AREA(ACRES) =     8.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      211.59    16.49       3.661        146.35
     2       52.75     5.54       7.396          8.39

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      157.47     5.54       7.396
     2      237.70    16.49       3.661
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     237.70   Tc(MIN.) =    16.49
  TOTAL AREA(ACRES) =       154.7
  LONGEST FLOWPATH FROM NODE   1636.00 TO NODE    605.00 =   6275.00 FEET.


******************************************************************************
  FLOW PROCESS FROM NODE    605.00 TO NODE    606.00 IS CODE =   31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    550.00  DOWNSTREAM(FEET) =    540.00
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =   0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.86
  ESTIMATED PIPE DIAMETER(INCH) =  39.00     NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =      237.70
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    16.54
  LONGEST FLOWPATH FROM NODE   1636.00 TO NODE    606.00 =   6375.00 FEET.


******************************************************************************
  FLOW PROCESS FROM NODE    605.00 TO NODE    606.00 IS CODE =   81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.654
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3959
  SUBAREA AREA(ACRES) =    0.42    SUBAREA RUNOFF(CFS) =    0.54
  TOTAL AREA(ACRES) =       155.2    TOTAL RUNOFF(CFS) =     237.70
  TC(MIN.) =    16.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE


******************************************************************************
  FLOW PROCESS FROM NODE    606.00 TO NODE   1643.00 IS CODE =   31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    540.00  DOWNSTREAM(FEET) =    530.00
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =   0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.86
  ESTIMATED PIPE DIAMETER(INCH) =  39.00     NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =      237.70
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    16.59
  LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1643.00 =   6475.00 FEET.


******************************************************************************
  FLOW PROCESS FROM NODE   1643.00 TO NODE   1643.00 IS CODE =    1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.59
  RAINFALL INTENSITY(INCH/HR) =   3.65
  TOTAL STREAM AREA(ACRES) =   155.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    237.70


******************************************************************************
  FLOW PROCESS FROM NODE   1644.00 TO NODE   1645.00 IS CODE =   21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
```

```
   UPSTREAM ELEVATION(FEET) =     800.00
   DOWNSTREAM ELEVATION(FEET) =     760.00
   ELEVATION DIFFERENCE(FEET) =      40.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.596
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.904
   NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
   SUBAREA RUNOFF(CFS) =      1.00
   TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =       1.00

****************************************************************************
   FLOW PROCESS FROM NODE   1645.00 TO NODE   1646.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    760.00  DOWNSTREAM(FEET) =    635.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   690.00   CHANNEL SLOPE = 0.1812
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.622
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .5500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.36
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.80
   AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   1.98
   Tc(MIN.) =    6.58
   SUBAREA AREA(ACRES) =      3.45      SUBAREA RUNOFF(CFS) =   12.56
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.550
   TOTAL AREA(ACRES) =        3.7       PEAK FLOW RATE(CFS) =      13.40

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.30   FLOW VELOCITY(FEET/SEC.) =   7.19
   LONGEST FLOWPATH FROM NODE   1644.00 TO NODE   1646.00 =     790.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1646.00 TO NODE   1647.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    635.00  DOWNSTREAM(FEET) =    610.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   580.00   CHANNEL SLOPE = 0.0431
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   4.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.592
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.26
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.90
   AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   1.97
   Tc(MIN.) =    8.55
   SUBAREA AREA(ACRES) =      5.93      SUBAREA RUNOFF(CFS) =   11.61
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.427
   TOTAL AREA(ACRES) =        9.6       PEAK FLOW RATE(CFS) =      22.92

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.60   FLOW VELOCITY(FEET/SEC.) =   5.16
   LONGEST FLOWPATH FROM NODE   1644.00 TO NODE   1647.00 =    1370.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE   1647.00 TO NODE   1648.00 IS CODE =  51
----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    540.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   895.00   CHANNEL SLOPE = 0.0726
   CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   4.000
```

```
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.849
 *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.11
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  7.06
 AVERAGE FLOW DEPTH(FEET) =  0.65   TRAVEL TIME(MIN.) =  2.11
 Tc(MIN.) =   10.66
 SUBAREA AREA(ACRES) =    14.31       SUBAREA RUNOFF(CFS) =   24.29
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.381
 TOTAL AREA(ACRES) =       23.9        PEAK FLOW RATE(CFS) =     44.17

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74   FLOW VELOCITY(FEET/SEC.) =  7.54
 LONGEST FLOWPATH FROM NODE  1644.00 TO NODE  1648.00 =   2265.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  1648.00 TO NODE  1643.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   540.00  DOWNSTREAM(FEET) =   530.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.99
 ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      44.17
 PIPE TRAVEL TIME(MIN.) =   0.07   Tc(MIN.) =   10.74
 LONGEST FLOWPATH FROM NODE  1644.00 TO NODE  1643.00 =   2365.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  1643.00 TO NODE  1643.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.74
 RAINFALL INTENSITY(INCH/HR) =   4.83
 TOTAL STREAM AREA(ACRES) =    23.92
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.17

  ** CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1       237.70    16.59       3.647        155.16
    2        44.17    10.74       4.828         23.92

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

  ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
    1       223.72    10.74       4.828
    2       271.06    16.59       3.647

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      271.06   Tc(MIN.) =   16.59
  TOTAL AREA(ACRES) =      179.1
  LONGEST FLOWPATH FROM NODE  1636.00 TO NODE  1643.00 =   6475.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  1643.00 TO NODE  1649.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   530.00  DOWNSTREAM(FEET) =   520.00
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  45.0 INCH PIPE IS  31.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 32.76
 ESTIMATED PIPE DIAMETER(INCH) = 45.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    271.06
 PIPE TRAVEL TIME(MIN.) =   0.05   Tc(MIN.) =   16.64
 LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1649.00 =   6575.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1643.00 TO NODE   1649.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.640
  *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4008
 SUBAREA AREA(ACRES) =    2.47   SUBAREA RUNOFF(CFS) =    8.09
 TOTAL AREA(ACRES) =      181.5   TOTAL RUNOFF(CFS) =     271.06
 TC(MIN.) =   16.64
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****************************************************************************
  FLOW PROCESS FROM NODE   1649.00 TO NODE   1635.00 IS CODE =  51
-----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    520.00  DOWNSTREAM(FEET) =    490.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   700.00   CHANNEL SLOPE = 0.0429
 CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.495
  *USER SPECIFIED(SUBAREA):
 ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =  86
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    274.98
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.80
 AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   1.08
 Tc(MIN.) =   17.72
 SUBAREA AREA(ACRES) =      6.41       SUBAREA RUNOFF(CFS) =    7.84
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.399
 TOTAL AREA(ACRES) =      188.0       PEAK FLOW RATE(CFS) =     271.06

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 2.31   FLOW VELOCITY(FEET/SEC.) = 10.76
 LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1635.00 =   7275.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1635.00 TO NODE   1635.00 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      271.06     17.72       3.495       187.96
 LONGEST FLOWPATH FROM NODE   1636.00 TO NODE   1635.00 =   7275.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)   (ACRE)
    1      729.79     22.56       2.990       667.57
 LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1635.00 =  11953.00 FEET.

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

```
     1      844.11      17.72      3.495
     2      961.72      22.56      2.990


   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     961.72   Tc(MIN.) =    22.56
   TOTAL AREA(ACRES) =      855.5

*****************************************************************************
  FLOW PROCESS FROM NODE   1635.00 TO NODE   1635.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   1635.00 TO NODE   1650.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =   488.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  65.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 31.20
  ESTIMATED PIPE DIAMETER(INCH) = 81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     961.72
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   22.59
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1650.00 =   12003.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE   1650.00 TO NODE   1650.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    702.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    664.00
  DOWNSTREAM ELEVATION(FEET) =    662.00
  ELEVATION DIFFERENCE(FEET) =     2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.947
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =     86.05
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.862
  SUBAREA RUNOFF(CFS) =      1.61
  TOTAL AREA(ACRES) =       0.56   TOTAL RUNOFF(CFS) =       1.61

*****************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    703.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 662.00  DOWNSTREAM ELEVATION(FEET) =  645.00
  STREET LENGTH(FEET) = 1120.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```

```
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.64
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.38
     HALFSTREET FLOOD WIDTH(FEET) =   12.53
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.15
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.19
   STREET FLOW TRAVEL TIME(MIN.) =  5.93   Tc(MIN.) =   13.87
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.092
   RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
   SOIL CLASSIFICATION IS "D"
   S.C.S. CURVE NUMBER (AMC II) =  86
   AREA-AVERAGE RUNOFF COEFFICIENT =  0.518
   SUBAREA AREA(ACRES) =     8.35       SUBAREA RUNOFF(CFS) =   17.77
   TOTAL AREA(ACRES) =        8.9       PEAK FLOW RATE(CFS) =      18.89

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.84
   FLOW VELOCITY(FEET/SEC.) =  3.59   DEPTH*VELOCITY(FT*FT/SEC.) =  1.59
   LONGEST FLOWPATH FROM NODE   701.00 TO NODE    703.00 =   1215.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   703.00 TO NODE    703.00 IS CODE =  10
-------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
===============================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE   1701.00 TO NODE   1702.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1452.00
  ELEVATION DIFFERENCE(FEET) =     28.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.14

*******************************************************************************
  FLOW PROCESS FROM NODE   1702.00 TO NODE   1703.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1452.00  DOWNSTREAM(FEET) =    645.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1225.00   CHANNEL SLOPE = 0.6588
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.652
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  9.52
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =    8.41
  SUBAREA AREA(ACRES) =      7.81       SUBAREA RUNOFF(CFS) =   15.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        7.9       PEAK FLOW RATE(CFS) =      15.57

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.23   FLOW VELOCITY(FEET/SEC.) =  12.19
```

```
     LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1703.00 =   1325.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   1703.00 TO NODE   1704.00 IS CODE =  31
-------------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   645.00  DOWNSTREAM(FEET) =   640.00
   FLOW LENGTH(FEET) =   283.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.7 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   9.39
   ESTIMATED PIPE DIAMETER(INCH) = 21.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      15.57
   PIPE TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =    8.91
   LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1704.00 =   1608.00 FEET.

*******************************************************************************
   FLOW PROCESS FROM NODE   1704.00 TO NODE   1704.00 IS CODE =   1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   8.91
   RAINFALL INTENSITY(INCH/HR) =   5.44
   TOTAL STREAM AREA(ACRES) =    7.87
   PEAK FLOW RATE(CFS) AT CONFLUENCE =    15.57

*******************************************************************************
   FLOW PROCESS FROM NODE   1705.00 TO NODE   1706.00 IS CODE =  21
-------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1480.00
   DOWNSTREAM ELEVATION(FEET) =   1458.00
   ELEVATION DIFFERENCE(FEET) =    22.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
   WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
   SUBAREA RUNOFF(CFS) =      0.12
   TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =       0.12

*******************************************************************************
   FLOW PROCESS FROM NODE   1706.00 TO NODE   1707.00 IS CODE =  51
-------------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   1458.00  DOWNSTREAM(FEET) =    695.00
   CHANNEL LENGTH THRU SUBAREA(FEET) = 2091.00   CHANNEL SLOPE =  0.3649
   CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
   MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.933
   *USER SPECIFIED(SUBAREA):
   ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
   S.C.S. CURVE NUMBER (AMC II) = 86
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.52
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  8.46
   AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   4.12
   Tc(MIN.) =   10.38
   SUBAREA AREA(ACRES) =    19.62       SUBAREA RUNOFF(CFS) =   33.88
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
   TOTAL AREA(ACRES) =        19.7        PEAK FLOW RATE(CFS) =       33.96

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) = 0.29   FLOW VELOCITY(FEET/SEC.) = 10.66
```

```
      LONGEST FLOWPATH FROM NODE   1705.00 TO NODE   1707.00 =    2191.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1707.00 TO NODE   1708.00 IS CODE =  51
---------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    695.00  DOWNSTREAM(FEET) =    645.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   279.00   CHANNEL SLOPE =  0.1792
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.803
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     40.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.54
  AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   0.44
  Tc(MIN.) =   10.83
  SUBAREA AREA(ACRES) =      7.48      SUBAREA RUNOFF(CFS) =   12.57
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        27.1        PEAK FLOW RATE(CFS) =     45.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   FLOW VELOCITY(FEET/SEC.) = 10.88
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE   1708.00 =    2470.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1708.00 TO NODE   1704.00 IS CODE =  31
---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.00  DOWNSTREAM(FEET) =   640.00
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 18.23
  ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      45.64
  PIPE TRAVEL TIME(MIN.) =   0.09   Tc(MIN.) =   10.91
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE   1704.00 =    2565.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE   1704.00 TO NODE   1704.00 IS CODE =   1
---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.91
  RAINFALL INTENSITY(INCH/HR) =  4.78
  TOTAL STREAM AREA(ACRES) =   27.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.64

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc       INTENSITY      AREA
  NUMBER    (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1      15.57      8.91        5.444         7.87
     2      45.64     10.91        4.778        27.15

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

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER    (CFS)     (MIN.)   (INCH/HOUR)
     1      52.84      8.91       5.444
     2      59.30     10.91       4.778
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     59.30   Tc(MIN.) =   10.91
  TOTAL AREA(ACRES) =       35.0
  LONGEST FLOWPATH FROM NODE  1705.00 TO NODE  1704.00 =   2565.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE  1704.00 TO NODE   703.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   640.00  DOWNSTREAM(FEET) =   637.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.08
  ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      59.30
  PIPE TRAVEL TIME(MIN.) =   0.28   Tc(MIN.) =   11.19
  LONGEST FLOWPATH FROM NODE  1705.00 TO NODE   703.00 =   2765.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   703.00 TO NODE   703.00 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      59.30    11.19      4.702       35.02
  LONGEST FLOWPATH FROM NODE  1705.00 TO NODE   703.00 =   2765.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM    RUNOFF     Tc      INTENSITY    AREA
  NUMBER    (CFS)    (MIN.)  (INCH/HOUR)  (ACRE)
     1      18.89    13.87      4.092        8.91
  LONGEST FLOWPATH FROM NODE   701.00 TO NODE   703.00 =   1215.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF     Tc      INTENSITY
  NUMBER    (CFS)    (MIN.)  (INCH/HOUR)
     1      74.54    11.19      4.702
     2      70.51    13.87      4.092

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     74.54   Tc(MIN.) =   11.19
  TOTAL AREA(ACRES) =       43.9

*******************************************************************************
  FLOW PROCESS FROM NODE   703.00 TO NODE   703.00 IS CODE =  12
-------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
===============================================================================

*******************************************************************************
  FLOW PROCESS FROM NODE   703.00 TO NODE   704.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   647.00  DOWNSTREAM(FEET) =   620.00
  FLOW LENGTH(FEET) =   720.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.96
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      74.54
  PIPE TRAVEL TIME(MIN.) =   0.67   Tc(MIN.) =   11.86
  LONGEST FLOWPATH FROM NODE  1705.00 TO NODE   704.00 =   3485.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   703.00 TO NODE   704.00 IS CODE =  81
```

```
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.529
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4117
  SUBAREA AREA(ACRES) =   11.21   SUBAREA RUNOFF(CFS) =   26.40
  TOTAL AREA(ACRES) =        55.1   TOTAL RUNOFF(CFS) =      102.82
  TC(MIN.) =   11.86

********************************************************************************
  FLOW PROCESS FROM NODE   704.00 TO NODE   704.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.86
  RAINFALL INTENSITY(INCH/HR) =   4.53
  TOTAL STREAM AREA(ACRES) =    55.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    102.82

********************************************************************************
  FLOW PROCESS FROM NODE  1709.00 TO NODE  1710.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1452.00
  ELEVATION DIFFERENCE(FEET) =     28.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   6.833
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =       0.06   TOTAL RUNOFF(CFS) =       0.14

********************************************************************************
  FLOW PROCESS FROM NODE  1710.00 TO NODE  1711.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1452.00  DOWNSTREAM(FEET) =    780.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1710.00   CHANNEL SLOPE = 0.3930
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) = 10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.899
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   10.50
  SUBAREA AREA(ACRES) =    10.55       SUBAREA RUNOFF(CFS) =   18.09
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =        10.6         PEAK FLOW RATE(CFS) =      18.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   FLOW VELOCITY(FEET/SEC.) =   8.79
  LONGEST FLOWPATH FROM NODE  1709.00 TO NODE  1711.00 =   1810.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  1711.00 TO NODE  1712.00 IS CODE =  51
--------------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    780.00  DOWNSTREAM(FEET) =    635.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   785.00   CHANNEL SLOPE =  0.1847
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.542
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     29.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.01
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.31
  Tc(MIN.) =   11.80
  SUBAREA AREA(ACRES) =    13.62      SUBAREA RUNOFF(CFS) =   21.65
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        24.2        PEAK FLOW RATE(CFS) =      38.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =  10.89
  LONGEST FLOWPATH FROM NODE   1709.00 TO NODE   1712.00 =   2595.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1712.00 TO NODE    704.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    635.00  DOWNSTREAM(FEET) =    620.00
  FLOW LENGTH(FEET) =    780.00   MANNING'S N =   0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.95
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.52
  PIPE TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   12.89
  LONGEST FLOWPATH FROM NODE   1709.00 TO NODE    704.00 =   3375.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    704.00 TO NODE    704.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.89
  RAINFALL INTENSITY(INCH/HR) =   4.29
  TOTAL STREAM AREA(ACRES) =    24.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.52

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY       AREA
  NUMBER     (CFS)      (MIN.)   (INCH/HOUR)     (ACRE)
     1      102.82     11.86       4.529         55.14
     2       38.52     12.89       4.291         24.23

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
     1      138.24     11.86       4.529
     2      135.93     12.89       4.291

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      138.24   Tc(MIN.) =   11.86
  TOTAL AREA(ACRES) =       79.4
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    704.00 =   3485.00 FEET.
```

```
******************************************************************************
  FLOW PROCESS FROM NODE   704.00 TO NODE   705.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   620.00  DOWNSTREAM(FEET) =   598.00
  FLOW LENGTH(FEET) =   468.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.73
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     138.24
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   12.20
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    705.00 =   3953.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   704.00 TO NODE   705.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.446
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4054
  SUBAREA AREA(ACRES) =    8.64   SUBAREA RUNOFF(CFS) =   19.98
  TOTAL AREA(ACRES) =       88.0   TOTAL RUNOFF(CFS) =     158.63
  TC(MIN.) =   12.20

******************************************************************************
  FLOW PROCESS FROM NODE   705.00 TO NODE   706.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   598.00  DOWNSTREAM(FEET) =   575.00
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.96
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     158.63
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =   12.34
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    706.00 =   4193.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   706.00 TO NODE   706.00 IS 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) =   4.41
  TOTAL STREAM AREA(ACRES) =    88.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    158.63

******************************************************************************
  FLOW PROCESS FROM NODE   707.00 TO NODE   708.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   90.00
  UPSTREAM ELEVATION(FEET) =   660.00
  DOWNSTREAM ELEVATION(FEET) =   658.00
  ELEVATION DIFFERENCE(FEET) =    2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.303
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    83.33
```

```
            (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.190
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =       0.18   TOTAL RUNOFF(CFS) =      0.58

***************************************************************************
  FLOW PROCESS FROM NODE    708.00 TO NODE    706.00 IS CODE = 62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) = 658.00  DOWNSTREAM ELEVATION(FEET) = 575.00
  STREET LENGTH(FEET) = 1330.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 16.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.35
    HALFSTREET FLOOD WIDTH(FEET) =   11.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.08
  STREET FLOW TRAVEL TIME(MIN.) =   3.74   Tc(MIN.) =   11.04
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.742
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
  SUBAREA AREA(ACRES) =   12.62      SUBAREA RUNOFF(CFS) =   31.12
  TOTAL AREA(ACRES) =        12.8       PEAK FLOW RATE(CFS) =      31.57

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =   14.66
  FLOW VELOCITY(FEET/SEC.) = 6.96   DEPTH*VELOCITY(FT*FT/SEC.) =   2.92
  LONGEST FLOWPATH FROM NODE    707.00 TO NODE    706.00 =   1420.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    706.00 TO NODE    706.00 IS CODE =  1
---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.04
  RAINFALL INTENSITY(INCH/HR) =   4.74
  TOTAL STREAM AREA(ACRES) =   12.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.57

  ** CONFLUENCE DATA **
  STREAM    RUNOFF      Tc     INTENSITY     AREA
  NUMBER     (CFS)    (MIN.)  (INCH/HOUR)   (ACRE)
     1      158.63    12.34      4.413        88.01
     2       31.57    11.04      4.742        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      179.18    11.04      4.742
```

```
    2      188.00    12.34       4.413

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      188.00   Tc(MIN.) =   12.34
  TOTAL AREA(ACRES) =       100.8
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    706.00 =   4193.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    706.00 TO NODE    709.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   575.00  DOWNSTREAM(FEET) =   540.00
  FLOW LENGTH(FEET) =    835.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.72
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     188.00
  PIPE TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =   12.93
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    709.00 =   5028.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    706.00 TO NODE    709.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.283
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4290
  SUBAREA AREA(ACRES) =   10.09   SUBAREA RUNOFF(CFS) =   22.47
  TOTAL AREA(ACRES) =       110.9   TOTAL RUNOFF(CFS) =      203.77
  TC(MIN.) =   12.93

*******************************************************************************
  FLOW PROCESS FROM NODE    709.00 TO NODE    709.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.93
  RAINFALL INTENSITY(INCH/HR) =   4.28
  TOTAL STREAM AREA(ACRES) =   110.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    203.77

*******************************************************************************
  FLOW PROCESS FROM NODE    710.00 TO NODE    711.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   600.00
  DOWNSTREAM ELEVATION(FEET) =   598.00
  ELEVATION DIFFERENCE(FEET) =    2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.303
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    83.33
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.190
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =       0.27   TOTAL RUNOFF(CFS) =      0.87

*******************************************************************************
  FLOW PROCESS FROM NODE    711.00 TO NODE    709.00 IS CODE =  62
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 598.00  DOWNSTREAM ELEVATION(FEET) =  540.00
  STREET LENGTH(FEET) =   860.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.91
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.67
  STREET FLOW TRAVEL TIME(MIN.) =   2.60   Tc(MIN.) =   9.91
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.086
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
  SUBAREA AREA(ACRES) =    6.80       SUBAREA RUNOFF(CFS) =   17.98
  TOTAL AREA(ACRES) =        7.1        PEAK FLOW RATE(CFS) =     18.70

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.63
  FLOW VELOCITY(FEET/SEC.) =  6.36   DEPTH*VELOCITY(FT*FT/SEC.) =   2.28
  LONGEST FLOWPATH FROM NODE   710.00 TO NODE    709.00 =    950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    709.00 TO NODE    709.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.91
  RAINFALL INTENSITY(INCH/HR) =   5.09
  TOTAL STREAM AREA(ACRES) =    7.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.70

  ** CONFLUENCE DATA **
  STREAM      RUNOFF      Tc      INTENSITY       AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)     (ACRE)
     1      203.77    12.93        4.283         110.90
     2       18.70     9.91        5.086           7.07

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

  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
     1      190.30     9.91        5.086
     2      219.52    12.93        4.283

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      219.52   Tc(MIN.) =   12.93
  TOTAL AREA(ACRES) =       118.0
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    709.00 =    5028.00 FEET.

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

```
 FLOW PROCESS FROM NODE    709.00 TO NODE    712.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    540.00  DOWNSTREAM(FEET) =   520.00
  FLOW LENGTH(FEET) =    515.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.92
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =     219.52
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   13.29
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    712.00 =    5543.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    709.00 TO NODE    712.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.208
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7000
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4427
  SUBAREA AREA(ACRES) =    3.78   SUBAREA RUNOFF(CFS) =   11.13
  TOTAL AREA(ACRES) =       121.7   TOTAL RUNOFF(CFS) =      226.81
  TC(MIN.) =   13.29

*******************************************************************************
  FLOW PROCESS FROM NODE    712.00 TO NODE    713.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    520.00  DOWNSTREAM(FEET) =   510.00
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.67
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =     226.81
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   13.34
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE    713.00 =    5643.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    712.00 TO NODE    713.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.198
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4421
  SUBAREA AREA(ACRES) =    0.77   SUBAREA RUNOFF(CFS) =    1.13
  TOTAL AREA(ACRES) =       122.5   TOTAL RUNOFF(CFS) =      227.41
  TC(MIN.) =   13.34

+-----------------------------------------------------------------------------+
| Dischrage at Basin #7.                                                       |
|                                                                             |
|                                                                             |
|                                                                             |
+-----------------------------------------------------------------------------+

*******************************************************************************
  FLOW PROCESS FROM NODE    713.00 TO NODE   1650.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    510.00  DOWNSTREAM(FEET) =   493.00
  FLOW LENGTH(FEET) =    755.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  38.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.75
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    227.41
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   13.97
  LONGEST FLOWPATH FROM NODE   1705.00 TO NODE   1650.00 =   6398.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    713.00 TO NODE   1650.00 IS CODE =  81
-----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.074
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4526
  SUBAREA AREA(ACRES) =    3.24   SUBAREA RUNOFF(CFS) =   11.22
  TOTAL AREA(ACRES) =       125.8   TOTAL RUNOFF(CFS) =     231.89
  TC(MIN.) =   13.97

*****************************************************************************
  FLOW PROCESS FROM NODE   1650.00 TO NODE   1650.00 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       231.89     13.97       4.074       125.76
   LONGEST FLOWPATH FROM NODE   1705.00 TO NODE   1650.00 =   6398.00 FEET.

   ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM     RUNOFF      Tc       INTENSITY      AREA
   NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       961.72     22.59       2.988       855.53
   LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1650.00 =  12003.00 FEET.

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF      Tc       INTENSITY
   NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1       826.72     13.97       4.074
     2      1131.81     22.59       2.988

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1131.81   Tc(MIN.) =   22.59
  TOTAL AREA(ACRES) =       981.3

*****************************************************************************
  FLOW PROCESS FROM NODE   1650.00 TO NODE   1650.00 IS CODE =  12
-----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   1650.00 TO NODE   1650.00 IS CODE =  10
-----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=============================================================================

*****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2202.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    582.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    580.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.358
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =     81.58
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =        0.13   TOTAL RUNOFF(CFS) =       0.42

*******************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2203.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) = 580.00  DOWNSTREAM ELEVATION(FEET) = 530.00
  STREET LENGTH(FEET) =   595.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.74
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.75
  STREET FLOW TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =    9.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.404
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =     6.62      SUBAREA RUNOFF(CFS) =   18.60
  TOTAL AREA(ACRES) =          6.8        PEAK FLOW RATE(CFS) =      18.97

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =   11.22
  FLOW VELOCITY(FEET/SEC.) = 6.89   DEPTH*VELOCITY(FT*FT/SEC.) =   2.41
  LONGEST FLOWPATH FROM NODE   2201.00 TO NODE   2203.00 =     690.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2204.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    498.00
  FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS    9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 20.76
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.97
  PIPE TRAVEL TIME(MIN.) =   0.20   Tc(MIN.) =    9.22
  LONGEST FLOWPATH FROM NODE   2201.00 TO NODE   2204.00 =     945.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2204.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
```

```
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.326
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7500
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5862
 SUBAREA AREA(ACRES) =    2.73   SUBAREA RUNOFF(CFS) =   10.90
 TOTAL AREA(ACRES) =        9.5   TOTAL RUNOFF(CFS) =      29.60
 TC(MIN.) =    9.22

******************************************************************************
  FLOW PROCESS FROM NODE   2204.00 TO NODE   2205.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   498.00  DOWNSTREAM(FEET) =   496.00
 FLOW LENGTH(FEET) =   295.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.59
 ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      29.60
 PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =    9.87
 LONGEST FLOWPATH FROM NODE   2201.00 TO NODE   2205.00 =   1240.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2204.00 TO NODE   2205.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.098
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6145
 SUBAREA AREA(ACRES) =    1.14   SUBAREA RUNOFF(CFS) =    4.94
 TOTAL AREA(ACRES) =       10.6   TOTAL RUNOFF(CFS) =      33.27
 TC(MIN.) =    9.87

******************************************************************************
  FLOW PROCESS FROM NODE   2205.00 TO NODE   2205.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.87
 RAINFALL INTENSITY(INCH/HR) =   5.10
 TOTAL STREAM AREA(ACRES) =   10.62
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.27

******************************************************************************
  FLOW PROCESS FROM NODE   2206.00 TO NODE   2207.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  86
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   95.00
 UPSTREAM ELEVATION(FEET) =   579.00
 DOWNSTREAM ELEVATION(FEET) =   577.00
 ELEVATION DIFFERENCE(FEET) =    2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   7.358
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    81.58
           (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.161
 SUBAREA RUNOFF(CFS) =     0.45
 TOTAL AREA(ACRES) =       0.14   TOTAL RUNOFF(CFS) =      0.45
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE   2207.00 TO NODE   2208.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =  577.00  DOWNSTREAM ELEVATION(FEET) =  555.00
  STREET LENGTH(FEET) =   905.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL) =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0350

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.35
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.43
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   4.68   Tc(MIN.) =   12.04
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.485
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.520
  SUBAREA AREA(ACRES) =    4.14       SUBAREA RUNOFF(CFS) =    9.66
  TOTAL AREA(ACRES) =        4.3        PEAK FLOW RATE(CFS) =       9.98

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.06
  FLOW VELOCITY(FEET/SEC.) =  3.72   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  LONGEST FLOWPATH FROM NODE   2206.00 TO NODE   2208.00 =    1000.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   2208.00 TO NODE   2205.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   560.00  DOWNSTREAM(FEET) =   496.00
  FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 23.71
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      9.98
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   12.19
  LONGEST FLOWPATH FROM NODE   2206.00 TO NODE   2205.00 =    1220.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   2205.00 TO NODE   2205.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.19
  RAINFALL INTENSITY(INCH/HR) =   4.45
  TOTAL STREAM AREA(ACRES) =     4.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.98

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

```
    1        33.27      9.87       5.098       10.62
    2         9.98     12.19       4.449        4.28


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

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF     Tc        INTENSITY
   NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1        41.35      9.87       5.098
     2        39.02     12.19       4.449

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      41.35   Tc(MIN.) =    9.87
   TOTAL AREA(ACRES) =        14.9
   LONGEST FLOWPATH FROM NODE   2201.00 TO NODE   2205.00 =    1240.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE   2205.00 TO NODE   1650.00 IS CODE =  31
---------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   496.00  DOWNSTREAM(FEET) =   493.00
   FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.3 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   9.70
   ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      41.35
   PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =   10.34
   LONGEST FLOWPATH FROM NODE   2201.00 TO NODE   1650.00 =    1515.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE   1650.00 TO NODE   1650.00 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        41.35     10.34       4.946        14.90
   LONGEST FLOWPATH FROM NODE   2201.00 TO NODE   1650.00 =    1515.00 FEET.

   ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM     RUNOFF     Tc        INTENSITY     AREA
   NUMBER     (CFS)     (MIN.)    (INCH/HOUR)   (ACRE)
     1      1131.81     22.59       2.988       981.29
   LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1650.00 =   12003.00 FEET.

   ** PEAK FLOW RATE TABLE **
   STREAM     RUNOFF     Tc        INTENSITY
   NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1       559.51     10.34       4.946
     2      1156.80     22.59       2.988

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =    1156.80   Tc(MIN.) =   22.59
   TOTAL AREA(ACRES) =       996.2

***************************************************************************
   FLOW PROCESS FROM NODE   1650.00 TO NODE   1650.00 IS CODE =  12
---------------------------------------------------------------------------
   >>>>>CLEAR MEMORY BANK # 1 <<<<<
===========================================================================

***************************************************************************
   FLOW PROCESS FROM NODE   1650.00 TO NODE   1651.00 IS CODE =  31
---------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   493.00  DOWNSTREAM(FEET) =   490.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  63.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.19
  ESTIMATED PIPE DIAMETER(INCH) =  81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1156.80
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   22.61
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1651.00 =   12053.00 FEET.


+------------------------------------------------------------------------------+
| Discharge at Culvert #18.                                                    |
|                                                                              |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+


*******************************************************************************
  FLOW PROCESS FROM NODE   1901.00 TO NODE   1902.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   605.00
  DOWNSTREAM ELEVATION(FEET) =   590.00
  ELEVATION DIFFERENCE(FEET) =    15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   6.833
  SUBAREA RUNOFF(CFS) =     0.22
  TOTAL AREA(ACRES) =       0.09   TOTAL RUNOFF(CFS) =      0.22


*******************************************************************************
  FLOW PROCESS FROM NODE   1902.00 TO NODE   1903.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    590.00  DOWNSTREAM(FEET) =    510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   290.00   CHANNEL SLOPE =  0.2759
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =   5.960
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.27
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.48
  Tc(MIN.) =    7.75
  SUBAREA AREA(ACRES) =     3.53        SUBAREA RUNOFF(CFS) =    7.36
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
  TOTAL AREA(ACRES) =         3.6        PEAK FLOW RATE(CFS) =       7.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 0.09   FLOW VELOCITY(FEET/SEC.) =   4.17
  LONGEST FLOWPATH FROM NODE   1901.00 TO NODE   1903.00 =    390.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1903.00 TO NODE   1904.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    510.00  DOWNSTREAM(FEET) =   507.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.015
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.66
```

```
   ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =        7.55
   PIPE TRAVEL TIME(MIN.) =  0.19    Tc(MIN.) =    7.94
   LONGEST FLOWPATH FROM NODE   1901.00 TO NODE   1904.00 =    490.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE   1903.00 TO NODE   1904.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.866
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  86
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4451
  SUBAREA AREA(ACRES) =    0.85   SUBAREA RUNOFF(CFS) =    4.24
  TOTAL AREA(ACRES) =        4.5   TOTAL RUNOFF(CFS) =      11.67
  TC(MIN.) =    7.94

*******************************************************************************
  FLOW PROCESS FROM NODE   1904.00 TO NODE   1905.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    507.00  DOWNSTREAM(FEET) =   505.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 11.97
  ESTIMATED PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       11.67
  PIPE TRAVEL TIME(MIN.) =  0.07    Tc(MIN.) =    8.01
  LONGEST FLOWPATH FROM NODE   1901.00 TO NODE   1905.00 =    540.00 FEET.


+-----------------------------------------------------------------------+
| Discharge at Culvert #19.                                             |
|                                                                       |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+


*******************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2002.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===============================================================================
  *USER SPECIFIED(SUBAREA):
  ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  86
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    805.00
  DOWNSTREAM ELEVATION(FEET) =    795.00
  ELEVATION DIFFERENCE(FEET) =    10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.833
  SUBAREA RUNOFF(CFS) =     0.24
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =      0.24

*******************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE   2003.00 IS CODE =  51
-------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     795.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) = 1605.00   CHANNEL SLOPE = 0.1745
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.185
  *USER SPECIFIED(SUBAREA):
```

```
ANNUAL GRASS (DRYLAND) POOR COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =  86
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     16.14
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.99
AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   3.35
Tc(MIN.) =    9.61
SUBAREA AREA(ACRES) =    17.17      SUBAREA RUNOFF(CFS) =   31.16
AREA-AVERAGE RUNOFF COEFFICIENT = 0.350
TOTAL AREA(ACRES) =        17.3       PEAK FLOW RATE(CFS) =      31.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.52   FLOW VELOCITY(FEET/SEC.) = 10.07
LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2003.00 =   1705.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE   2003.00 TO NODE   2004.00 IS CODE =  31
-----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   515.00 DOWNSTREAM(FEET) =   513.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.24
 ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    31.34
 PIPE TRAVEL TIME(MIN.) =   0.05   Tc(MIN.) =    9.67
 LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2004.00 =   1755.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE   2003.00 TO NODE   2004.00 IS CODE =  81
-----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.166
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  86
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4220
 SUBAREA AREA(ACRES) =    3.29   SUBAREA RUNOFF(CFS) =   13.60
 TOTAL AREA(ACRES) =        20.6   TOTAL RUNOFF(CFS) =      44.82
 TC(MIN.) =    9.67

*****************************************************************************
 FLOW PROCESS FROM NODE   2004.00 TO NODE   2005.00 IS CODE =  31
-----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   513.00 DOWNSTREAM(FEET) =   510.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.22
 ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    44.82
 PIPE TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    9.71
 LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2005.00 =   1805.00 FEET.

+---------------------------------------------------------------------------+
| Discharge at Culvert #20.                                                 |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+
=============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)    =        20.6  TC(MIN.) =       9.71
 PEAK FLOW RATE(CFS)  =      44.82
=============================================================================
=============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

CHAPTER 4

100-Year Hydrologic Model
for
Developed Conditions

4.2 – Unit Hydrograph Hydrologic Analysis
(HEC HMS)

OTAY RANCH VILLAGE 13

Developed Conditions
Runoff to Culvert No. 7

DRAINAGE	653 acres	
AREA	1.020	mi^2

CN = 98	0	acres	(Major Arterials)
CN = 92	0	acres	(Commercial Development)
CN = 91	0	acres	(Mixed Use - Schools, Hospital)
CN = 90	0	acres	(High Density Residential Development)
CN = 87	297	acres	(Single-Family Residential Development)
CN = 81	356	acres	(Open Space)

CURVE NUMBER =	84	PZN=2.0
	89	ADJUSTED PZN=2.5

Average n	0.028	
m	0.38	
L	2.3	miles
Lc	1.4	miles
U/S Elev.	1870	feet
D/S Elev.	485	feet
S	602.17	ft/mile

LAG TIME =	0.31	hours
	18.8 min	

SOIL GROUP D ASSUMED

OTAY RANCH VILLAGE 13

Developed Conditions

TOTAL DRAINAGE AREA	996.2 acres
	1.557 mi^2

Offsite Runoff to Culvert No. 18				Developed Area Runoff to Culvert No. 18			
DRAINAGE AREA	690.7 acres			**DRAINAGE AREA**	305.5 acres		
	1.079 mi^2				0.477 mi^2		
CN = 98	0	acres	(Major Arterials)	CN = 98	0	acres	(Major Arterials)
CN = 92	0	acres	(Commercial)	CN = 92		acres	(Commercial)
CN = 91	0	acres	(Mixed Use)	CN = 91	0	acres	(Mixed Use)
CN = 90	0	acres	(High Density Residential)	CN = 90	0	acres	(High Density Residential)
CN = 87	19.7	acres	(Single-Family Residential)	CN = 87	71.7	acres	(Single-Family Residential)
CN = 81	671.0	acres	(Open Space)	CN = 81	233.8	acres	(Open Space)
CURVE NUMBER =	81	PZN=2.0		**CURVE NUMBER =**	82	PZN=2.0	
	86.5	ADJUSTED PZN=2.5			**87**	ADJUSTED PZN=2.5	
Average n	0.035			Average n	0.030		
m	0.38			m	0.38		
L	2.2	miles		L	1.4	miles	
Lc	1.1	miles		Lc	0.7	miles	
U/S Elev.	1660	feet		U/S Elev.	1600	feet	
D/S Elev.	505	feet		D/S Elev.	505	feet	
S	525.00	ft/mile		S	782.14	ft/mile	
LAG TIME =	0.35	hours		**LAG TIME =**	0.20	hours	
	21.2	min			**12.2**	min	
SOIL GROUP D ASSUMED				SOIL GROUP D ASSUMED			

Table 4-10

RUNOFF CURVE NUMBERS FOR PZN CONDITIONS 1.0, 2.0, AND 3.0

CN For:			CN For:		
PZN Condition = 1.0	PZN Condition = 2.0	PZN Condition = 3.0	PZN Condition = 1.0	PZN Condition = 2.0	PZN Condition = 3.0
100	100	100	40	60	78
97	99	100	39	59	77
94	98	99	38	58	76
91	97	99	37	57	75
89	96	99	37	56	75
87	95	98	34	55	73
85	94	98	34	54	73
83	93	98	33	53	72
81	92	97	32	52	71
80	91	97	31	51	70
78	90	96	31	50	70
76	89	96	30	49	69
75	88	95	29	48	68
73	87	95	28	47	67
72	86	94	27	46	66
70	85	94	26	45	65
68	84 89	93	25	44	64
67	83	93	25	43	63
66	82 87	92	24	42	62
64	81 86.5	92	23	41	61
63	80	91	22	40	60
62	79	91	21	39	59
60	78	90	21	38	58
59	77	89	20	37	57
58	76	89	19	36	56
57	75	88	18	35	55
55	74	88	18	34	54
54	73	87	17	33	53
53	72	86	16	32	52
52	71	86	16	31	51
51	70	85	15	30	50
50	69	84			
48	68	84	12	25	43
47	67	83	9	20	37
46	66	82	6	15	30
45	65	82	4	10	22
44	64	81	2	5	13
43	63	80	0	0	0
42	62	79			
41	61	78			

4-47

SUBAREA 1 TO CULV-18

SUBAREA TO CULV-7

CHANNEL 1 TO CULV-18

CHANNEL TO CULV-7

SUBAREA 2 TO CULV-18

CHANNEL 2 TO CULV-18

CULV-7

CULV-18

Project: Otay Ranch Resort   Simulation Run: 100 year - Proposed

Start of Run: 13Nov2003, 00:00   Basin Model: Developed
End of Run: 14Nov2003, 00:00   Meteorologic Model: Otay Resort Rainfall
Compute Time: 08Dec2010, 13:48:55   Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
CHANNEL 1 TO CULV-18	1.079	833.1	13Nov2003, 04:45	94.2
CHANNEL 2 TO CULV-18	0.477	438.4	13Nov2003, 04:30	42.8
CHANNEL TO CULV-7	1.020	937.9	13Nov2003, 04:30	97.3
CULV-18	1.556	1198.5	13Nov2003, 04:30	137.0
CULV-7	1.020	937.9	13Nov2003, 04:30	97.3
SUBAREA 1 TO CULV-18	1.079	938.3	13Nov2003, 04:30	94.4
SUBAREA 2 TO CULV-18	0.477	496.0	13Nov2003, 04:15	42.6
SUBAREA TO CULV-7	1.020	1012.9	13Nov2003, 04:30	97.3

Subbasin "SUBAREA TO CULV-7" Results for Run "100 year - Proposed"
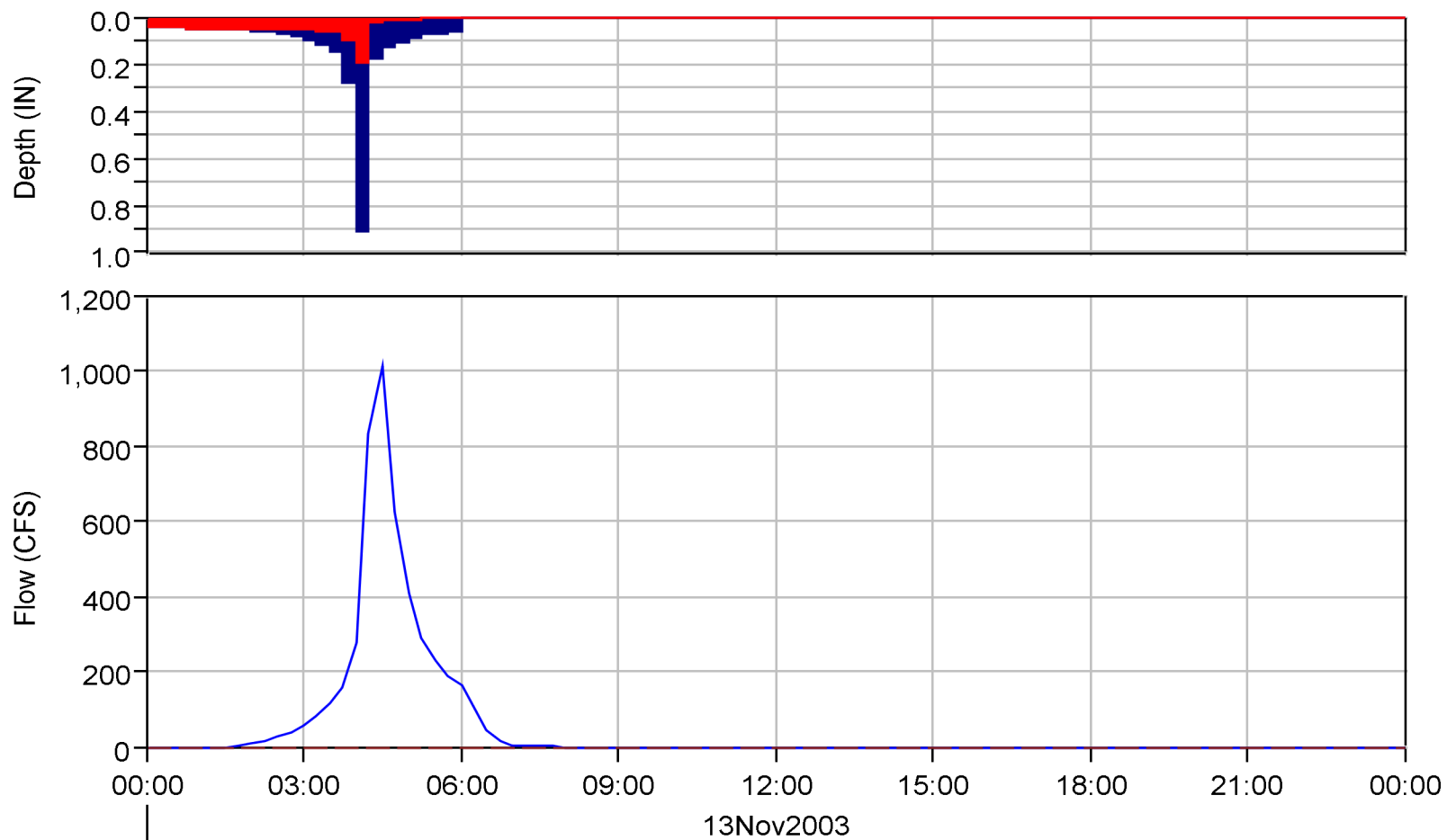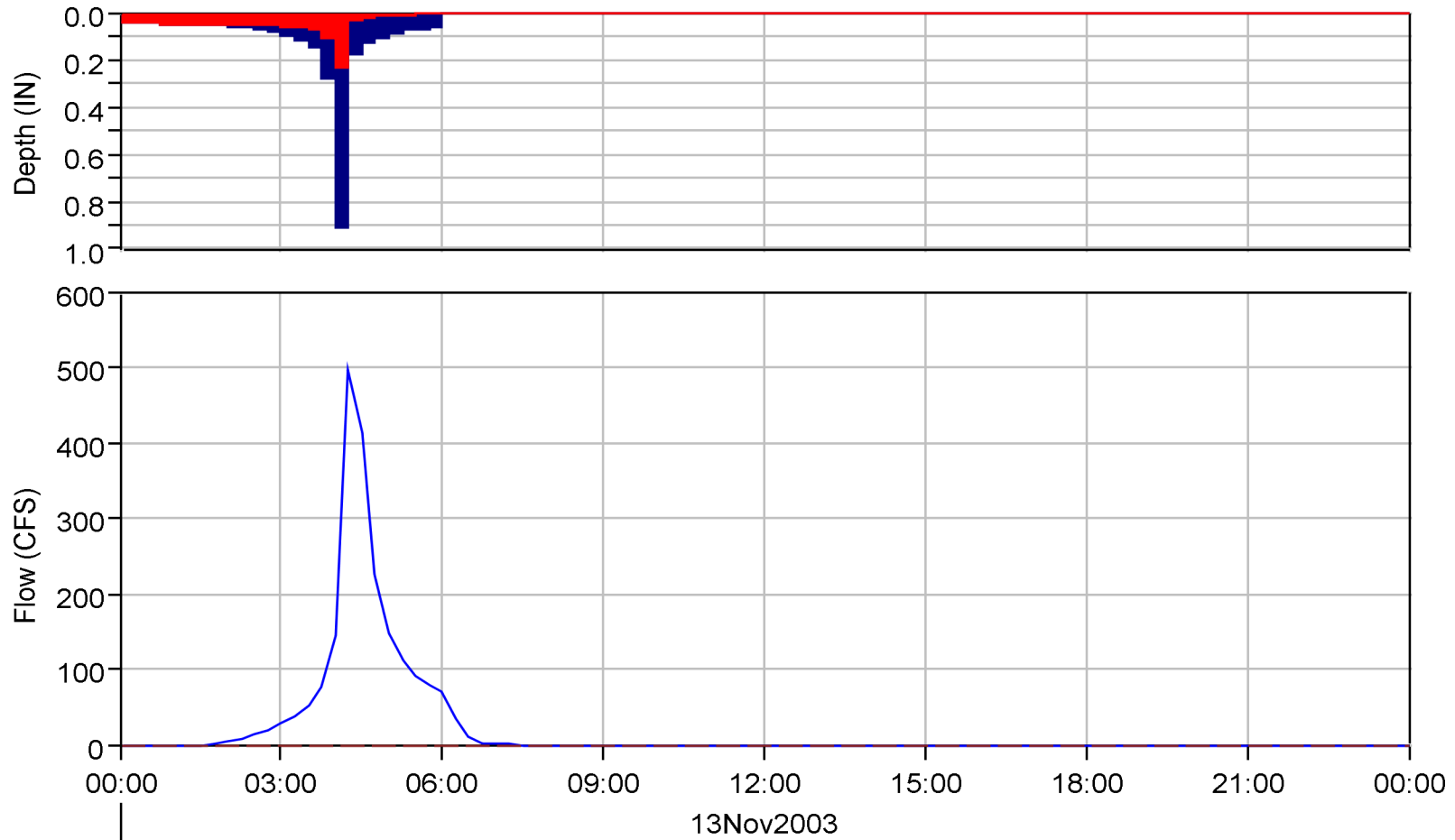
Run:100 year - Proposed Element:SUBAREA TO CULV-7 Result:Precipitation
Run:100 YEAR - PROPOSED Element:SUBAREA TO CULV-7 Result:Precipitation Loss
Run:100 year - Proposed Element:SUBAREA TO CULV-7 Result:Outflow
Run:100 YEAR - PROPOSED Element:SUBAREA TO CULV-7 Result:Baseflow

Reach "CHANNEL TO CULV-7" Results for Run "100 year - Proposed"
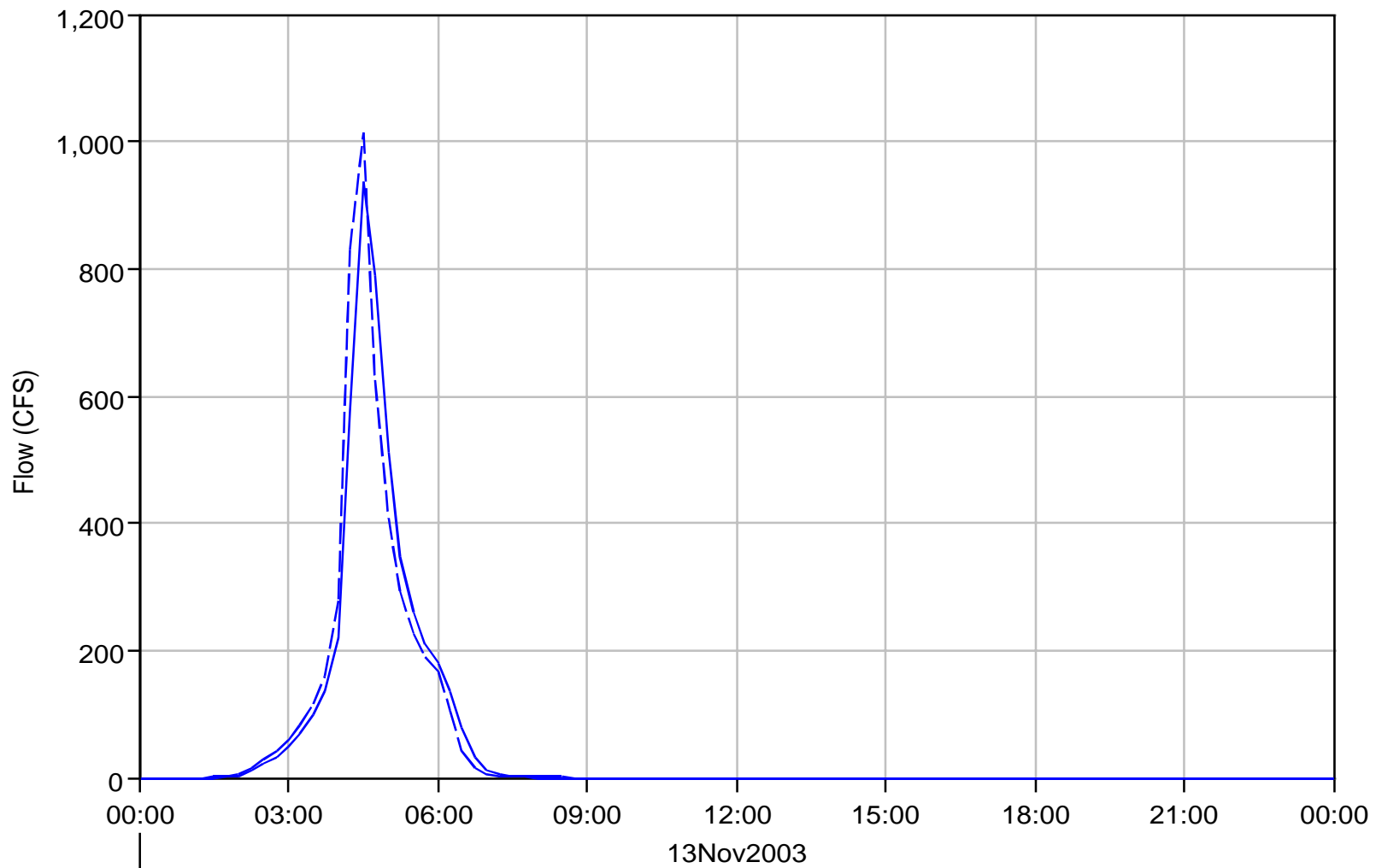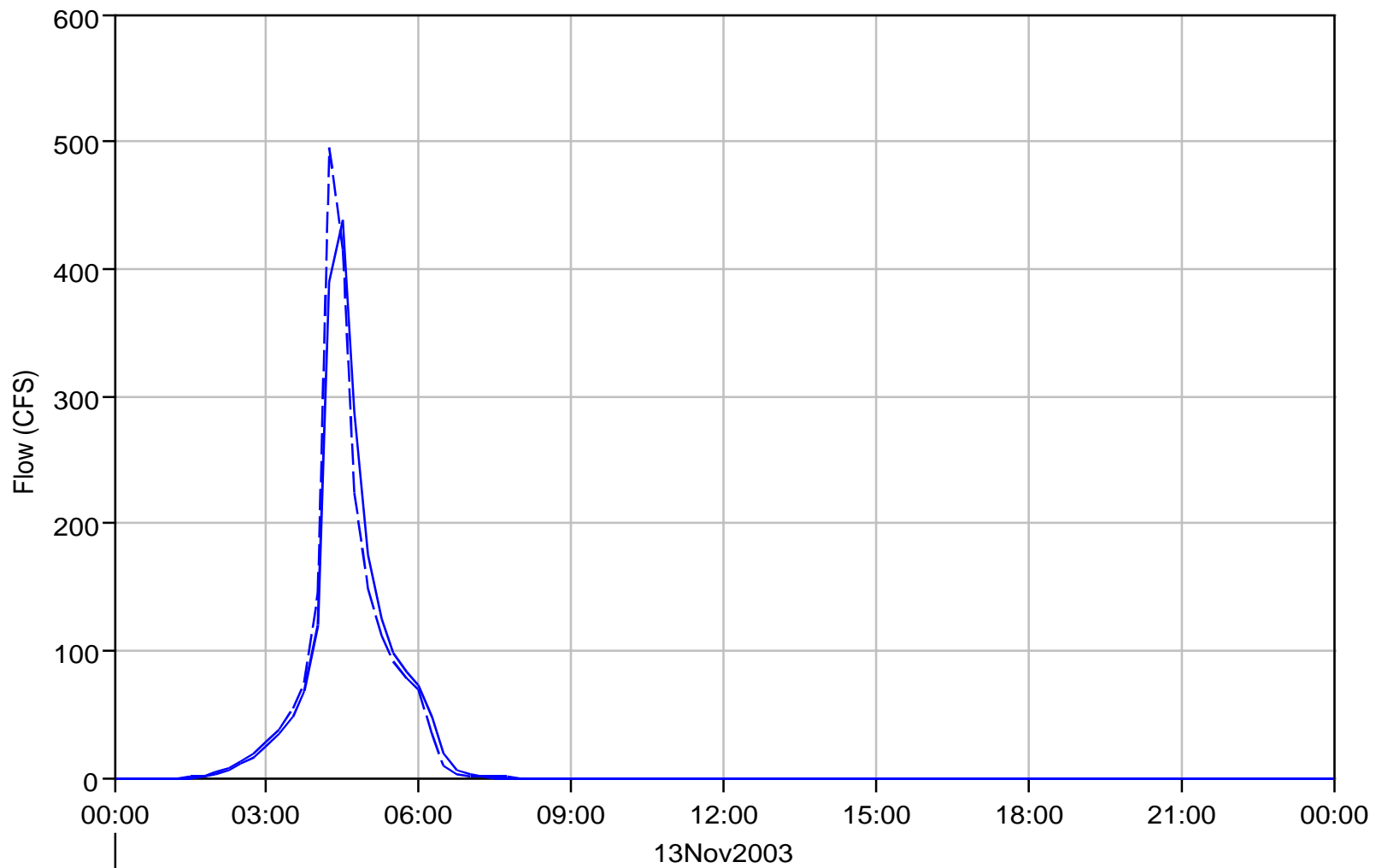
Run:100 year - Proposed Element:CHANNEL TO CULV-7 Result:Outflow

Run:100 YEAR - PROPOSED Element:CHANNEL TO CULV-7 Result:Combined Inflow

Junction "CULV-7" Results for Run "100 year - Proposed"

Flow (CFS)

13Nov2003
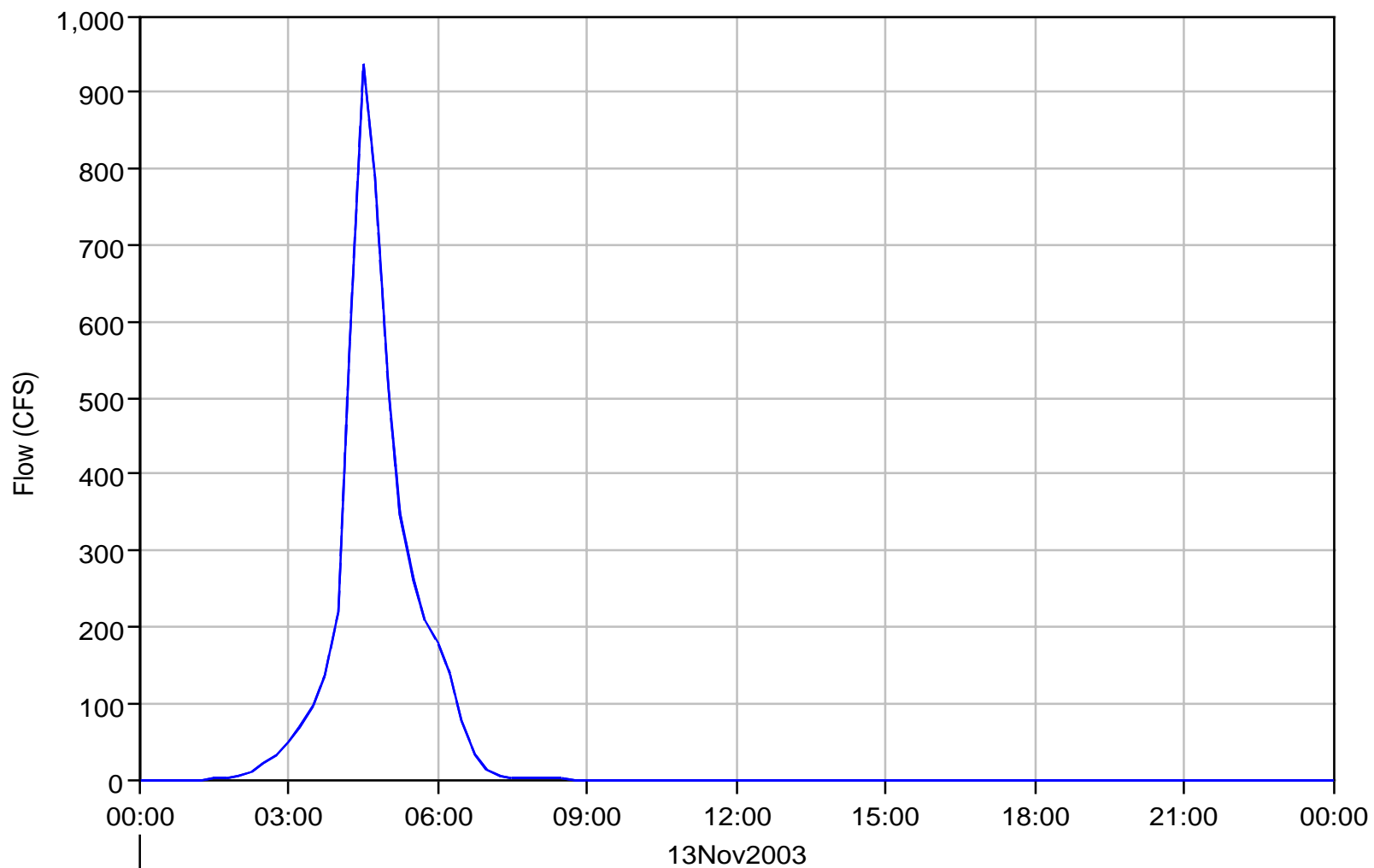
Run:100 year - Proposed Element:CULV-7 Result:Outflow

Run:100 year - Proposed Element:CHANNEL TO CULV-7 Result:Outflow

Subbasin "SUBAREA 1 TO CULV-18" Results for Run "100 year - Proposed"
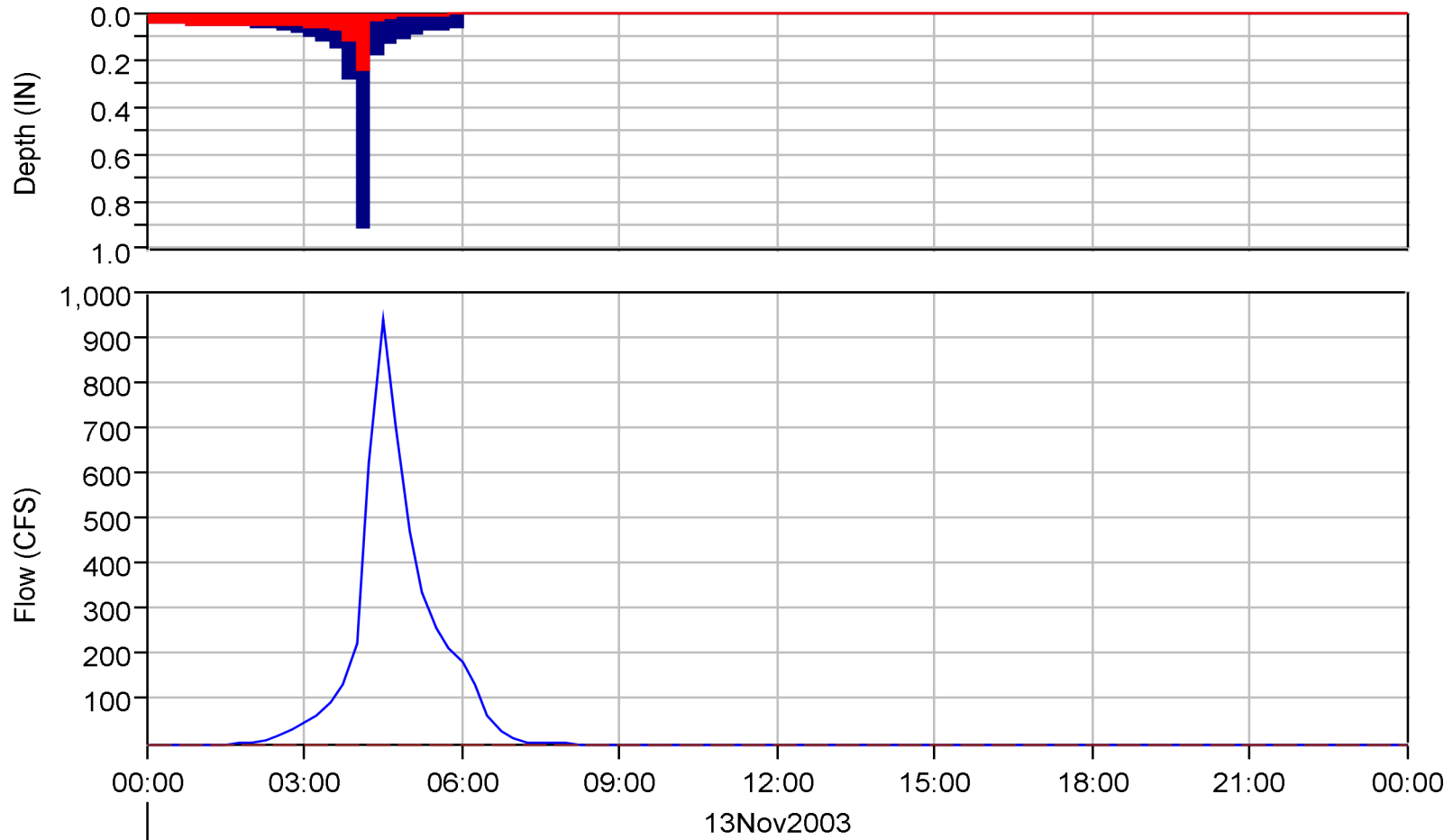
13Nov2003

Run:100 year - Proposed Element:SUBAREA 1 TO CULV-18 Result:Precipitation

Run:100 YEAR - PROPOSED Element:SUBAREA 1 TO CULV-18 Result:Precipitation Loss

Run:100 year - Proposed Element:SUBAREA 1 TO CULV-18 Result:Outflow

Run:100 YEAR - PROPOSED Element:SUBAREA 1 TO CULV-18 Result:Baseflow

Reach "CHANNEL 1 TO CULV-18" Results for Run "100 year - Proposed"
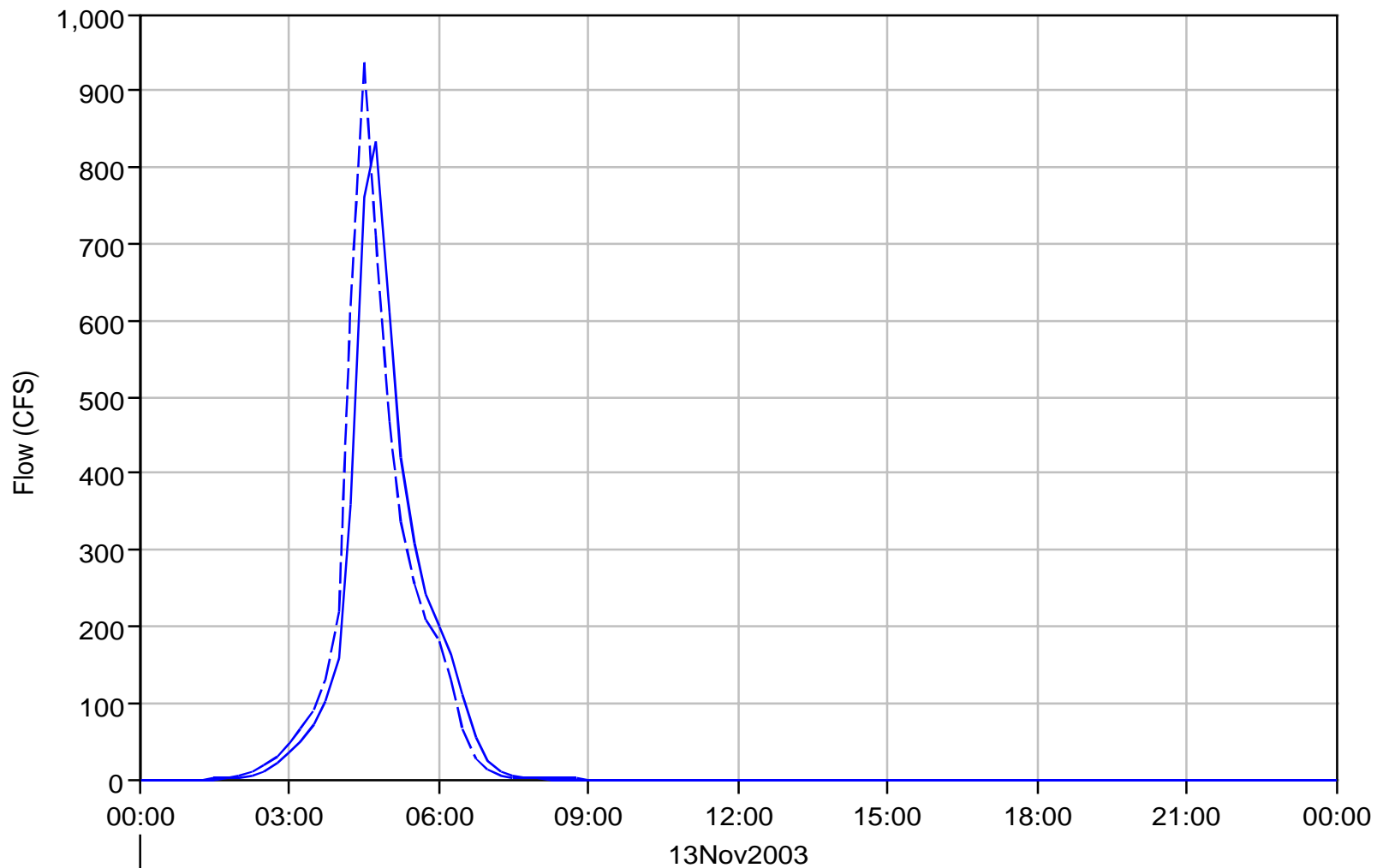
Flow (CFS)

13Nov2003

——— Run:100 year - Proposed Element:CHANNEL 1 TO CULV-18 Result:Outflow

– – – Run:100 YEAR - PROPOSED Element:CHANNEL 1 TO CULV-18 Result:Combined Inflow

Subbasin "SUBAREA 2 TO CULV-18" Results for Run "100 year - Proposed"

Legend:

Run:100 year - Proposed Element:SUBAREA 2 TO CULV-18 Result:Precipitation

Run:100 YEAR - PROPOSED Element:SUBAREA 2 TO CULV-18 Result:Precipitation Loss

Run:100 year - Proposed Element:SUBAREA 2 TO CULV-18 Result:Outflow

Run:100 YEAR - PROPOSED Element:SUBAREA 2 TO CULV-18 Result:Baseflow

Reach "CHANNEL 2 TO CULV-18" Results for Run "100 year - Proposed"

Run:100 year - Proposed Element:CHANNEL 2 TO CULV-18 Result:Outflow

Run:100 YEAR - PROPOSED Element:CHANNEL 2 TO CULV-18 Result:Combined Inflow

Junction "CULV-18" Results for Run "100 year - Proposed"
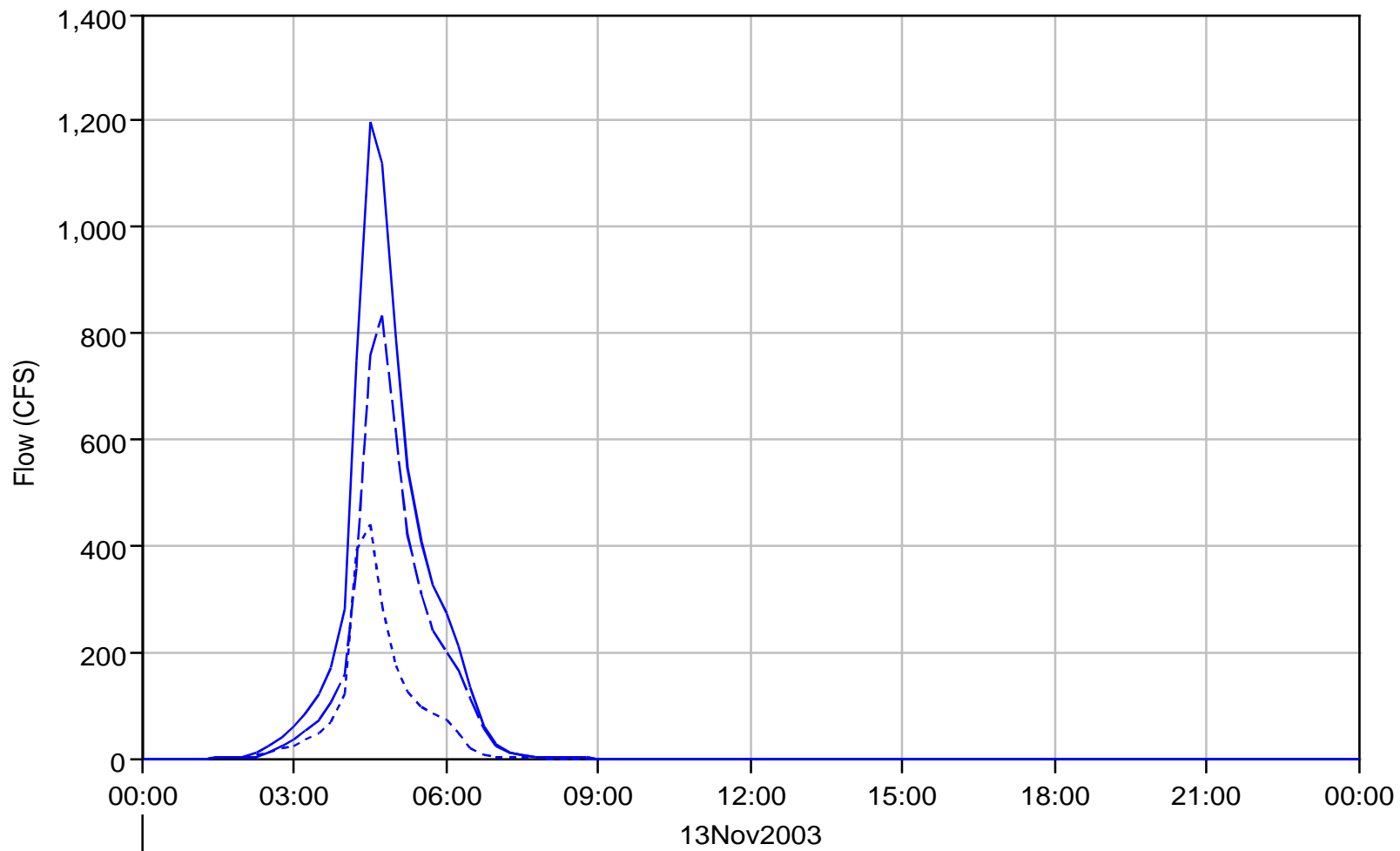
Run:100 year - Proposed Element:CULV-18 Result:Outflow

Run:100 year - Proposed Element:CHANNEL 1 TO CULV-18 Result:Outflow

Run:100 year - Proposed Element:CHANNEL 2 TO CULV-18 Result:Outflow

CHAPTER 5

Existing Condition Hydrology Maps