The Junipers Project
Environmental Impact Report

SCH No. 2018041032 - Project No. 586670

Appendix G1

Drainage Study

February 2020

JUNIPERS
DRAINAGE STUDY

City of San Diego, CA

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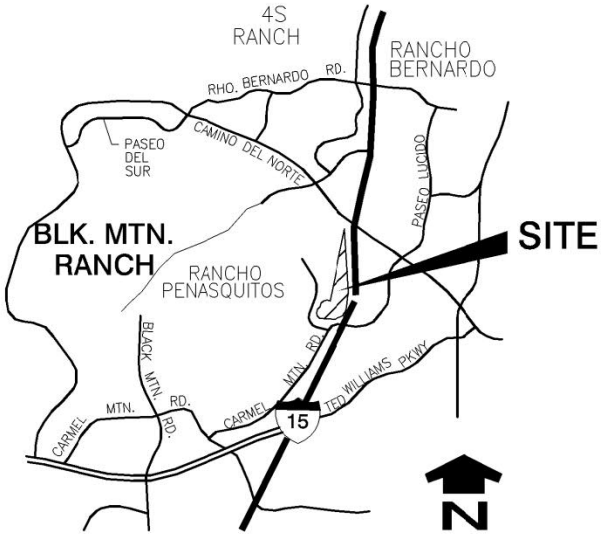
Appendix 3 – Soils Information

1 Scope

The purpose of this study is to provide hydrologic and hydraulic calculations in support of Junipers project a proposed development that will create 455 multifamily residential units and 81 affordable residential units in the City of San Diego, California. This report will quantify proposed runoff for the 100-year frequency storm event and provide calculations demonstrating that attenuation of post developed flows through four onsite biofiltration basins will not exceed pre-developed flows. Treatment of storm water runoff from the site has been addressed in a separate report - the “Priority Development Project Storm Water Quality Management Plan for The Junipers”.

2 Existing Conditions

The Junipers is a roughly 112-acre site, located in the City of San Diego, California. The site is currently a closed golf resort. The property abuts Interstate 15, or Avocado Highway, on its eastern bounds. To the west of the property, there are additional developed residential areas. Please see vicinity map below.



VICINITY MAP

NOT TO SCALE

The runoff from the property in existing conditions drains to four existing locations. Along the east of the property, runoff is collected through two inlets, on the east of the property, one near the southern portion of the site and one along the south eastern boundary.

In the northern portion of the site there is currently a channel which runs eastward onto the site. This channel carries the runoff from 50.54 acres of an offsite existing

neighborhood directly adjacent to the project boundary. The onsite and offsite runoff is conveyed through the project site into an existing channel between the Project site and Interstate 15. Flows from Interstate 15 confluence with the existing onsite channel after discharging from one of five storm drain systems along the eastern border of the site. The runoff from the channel flows into a 60" RCP storm drain that carries the water offsite.

The project is tributary to the Penasquitos Creek as a part of the Penasquitos Hydrologic Unit, Los Penasquitos Hydrologic Area (906.1). The site is not mapped within any special flood hazard areas.

According to the City of San Diego Drainage Design Manual, type "C" and "D" soils are assumed for the entire site. Type "C" soils are categorized as having a high potential for runoff. Type "D" soils are categorized as having a slow infiltration rate when thoroughly wet.

3 Proposed Conditions

The proposed development will create 455 multifamily residential units and 81 affordable residential units with landscaped areas, recreational areas, biofiltration basins, a modular wetland unit and streets within the 112-acre site.

Onsite drainage improvements will include water quality/hydromodification basins with a storm drain system to safely convey runoff through the project. Catch basins and storm drain pipes will be provided onsite to convey runoff to the existing drainage system.

Bypass storm drain will be constructed to convey offsite run-on flows through the proposed project to existing channel that flows to Chicarita Creek. Approval from the Regional Water Quality Control Board under the Federal Clean Water Act section 401 & 404 is required and necessary documentation will be provided prior to construction.

Drainage Routing and Improvements;

All onsite runoff will be collected and routed through three onsite basins to detain and attenuate the 100-year peak flows. Basin 1 will be located near the southwestern portion of the site. Basin 2 was originally placed in the southern reaches of the site to treat the portion of the proposed street that would otherwise drain offsite, has been eliminated. Basins 3 and 4 will be located next to each other near the eastern boundary of the site.

Offsite drainage patterns will be slightly altered due to the addition of two roundabouts along Penasquitos drive and the widening of Carmel Mountain Road. These offsite improvements will provide a net increase in pervious area and therefore a reduction in peak flows. An inlet will be placed along the median of the newly widened Carmel Mountain Road, thus reducing the peak flows from the inlet at the intersection of Penasquitos and Carmel Mountain Road.

Onsite drainage patterns in proposed conditions will remain unchanged and match existing condition flows pattern. The flow from the neighborhood, which currently is conveyed through the site, is proposed to be bypassed through the site using pipes that will outlet near the proposed Basin 4. Developed condition flows will connect to the same existing offsite storm drainage network.

According to calculations, the attenuated peak discharge in proposed conditions will be less than the existing conditions peak discharge.

4 Methodology

4.1 Hydrology

The Rational Method as described in the June 2003 San Diego County Hydrology Manual (SDCHM), Section 3, was used for the hydrologic calculations for this project. The Rational Method formula is expressed as follows:

$Q = C\ I\ A$

$I = 7.44 P_6 T_c^{-0.645}$

$T_c = T_t + T_i$

$T_t = (11.9 * L^3 / \Delta E)^{0.385}$

Where:
Q = Peak discharge, in cubic feet per second (cfs).
C = Runoff coefficient, proportion of the rainfall that runs off the surface. The C coefficient was obtained from Table 3-1 of the SDCHM. It has no units and is based on the soil group and the development type for the drainage sub-area.
A = Drainage area contributing to the design location (ac).
I = Average rainfall intensity (in/hr). The formula can be found on Figure 3-2 of the SDCHM.
P_6 = 6-hour precipitation (in). This value was taken from the 6-hour isopluvial maps found in Appendix B of the SDCHM.
T_i = Initial time of concentration, from Table 3-2 of the SDCHM.
T_t = Travel time (min), from Figure 3-4 of the SDCHM.
L = Longest flow path distance (mi).
ΔE = Change in elevation along flowpath (ft).

4.2 Hydraulics

The hydrology calculations discussed above provide peak flowrates which are entered into a separate program called Hydraflow Storm Sewer to perform hydraulic analysis and design of storm drain lines.

In order to provide adequate flood control, increases in peak flow rates at the outfall location for this site were mitigated using the design of the proposed basin. Mitigation within the basin was modeled using RickRatHydro as an input to Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2011.

RickRatHydro was used to produce a hydrograph for the project drainage areas, based on the area, time of concentration, P6 value, runoff coefficient, and peak flow rate.

The hydrograph was then imported into Hydraflow Hydrographs and was routed through the proposed basins by using an iteration of outlet structures, until the resulting outlet structure provided a flow rate to the outfall that was equal to or less than that during the existing condition, and the water surface elevation was below the top of the basin.

5 Results and Conclusions

The following tabulates the proposed peak flow rates and attenuated flow rates for the project hydrology. Per the San Diego County isopluvial maps, the rainfall depth for the 100-year flow event it 2.9 inches. Isopluvial map is included in Appendix 1.

TABLE 1 - Summary of Rational Method Hydrologic Analysis Results

Existing				Proposed				
Node (EX)	Area (Ac)	Q (cfs)	Runoff Coefficient "C"	Node (PR)	Area (Ac)	Q (cfs)^	Q (cfs)*	Runoff Coefficient "C"
106	30.8	47.34	0.35	8151	31.9	82.02	41.86	0.71
206	2.12	4.01	0.35	7010	4.5	11.87	5.54	0.79
306	16.78	23.99	0.35	4030	12.1	53.39	19.65	0.79
406	156.0	367.60	0.35	5130	157.5	391.85	342.32	0.79
606	31.8	50.85	0.35	8160	37.5	96.42	49.93	0.79
TOTAL	205.7	442.9	-	TOTAL	206	539.1	409.4	-

^ Runoff rates before flood attenuation

* Runoff rates after flood attenuation

As illustrated above, based on the attenuation provided by the four basins the peak flow is reduced to 409.4 cfs, lower than existing conditions flowrates.

Final storm drain, inlets and rip rap design details will be provided in the final engineering stage of development.

Conclusions

The project does not increase runoff in the 100-year storm event when utilizing onsite flood attenuation.

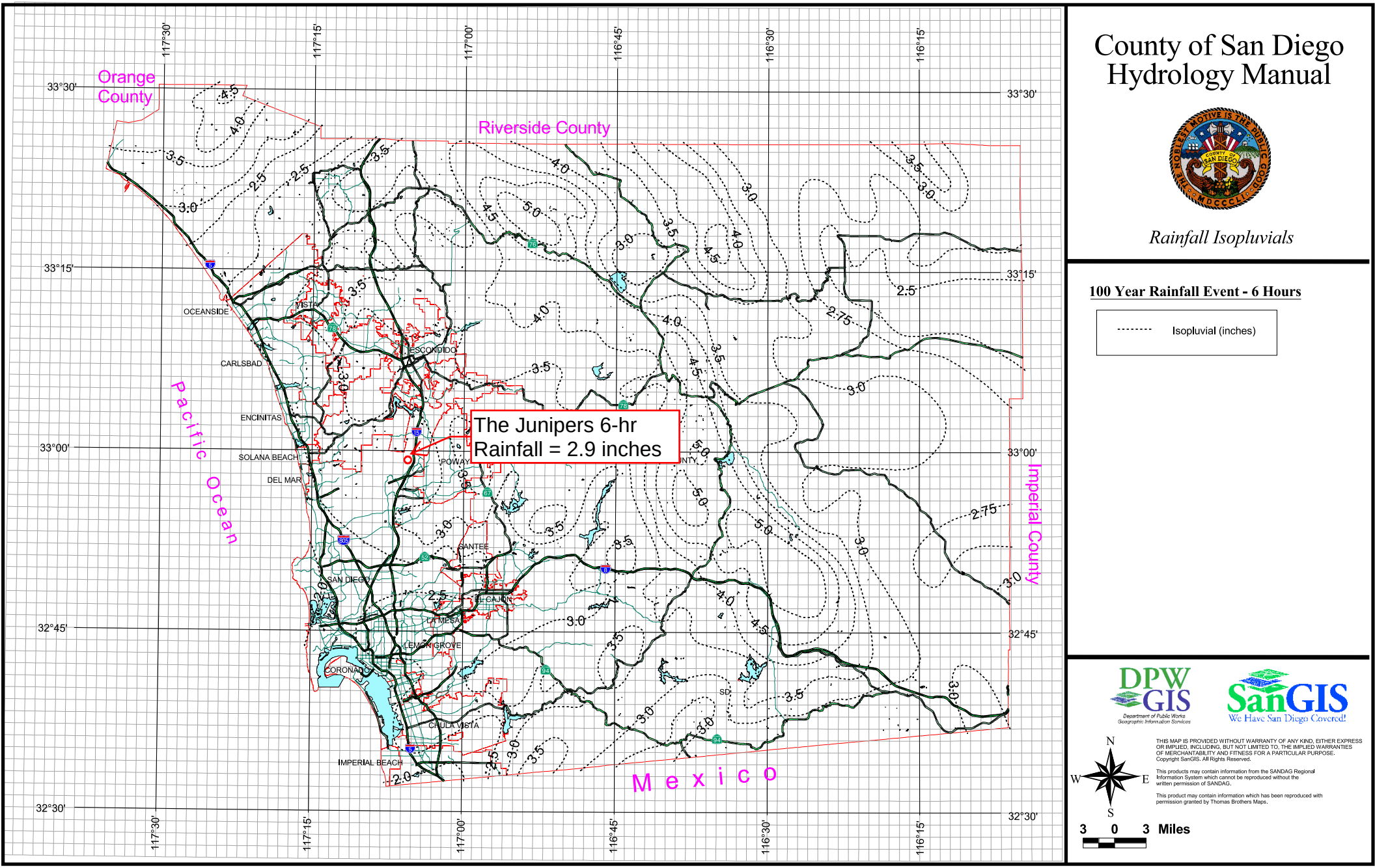
Since there will be no increase in runoff, there will be no negative impacts to downstream drainage facilities.

Please see our separate Storm Water Quality Management Report that provides mitigation for all onsite stormwater quality impacts, as well as hydromodification management.

6 Appendices

Appendix 1 - Hydrology Calculations and Exhibits

RAINFALL DATA



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

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THIS MAP IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
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3 0 3 Miles

RUNOFF COEFFICIENTS

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

EXISTING CONDITIONS

DEVELOPED CONDITIONS

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

EXISTING CONDITION

OFFSITE DISCHARGE ONTO SITE
EX Q100= 159.11 CFS

OFFSITE DISCHARGE ONTO SITE
EX Q100= 44.51 CFS

OFFSITE DISCHARGE ONTO SITE
EX Q100= 48.50 CFS

OFFSITE DISCHARGE ONTO SITE
EX Q100= 17.33 CFS

OFFSITE DISCHARGE ONTO SITE
EX Q100= 40.59 CFS

OFFSITE DISCHARGE ONTO SITE
EX Q100= 29.69 CFS

106 Q_{100} = 47.34 cfs.
A= 30.8 ac.
T_c = 11.82 min.

606 Q_{100} = 50.85 cfs.
A= 31.8 ac.
T_c = 13.24 min.

406 Q_{100} = 367.60 cfs.
A= 156.0 ac.
T_c = 14.07 min.

306 Q_{100} = 23.99 cfs.
A= 16.78 ac.
T_c = 13.78 min.

206 Q_{100} = 4.01 cfs.
A= 2.1 ac.
T_c = 8.56 min.

0.31 ACRES
50.23 ACRES
0.36 ACRES
0.87 ACRES
5.74 ACRES
5.45 ACRES
0.39 ACRES
2.90 ACRES
0.40 ACRES
5.32 ACRES
5.74 ACRES
0.41 ACRES
5.07 ACRES
0.40 ACRES
3.00 ACRES
0.35 ACRES
1.85 ACRES
10.48 ACRES
0.34 ACRES
1.01 ACRES
25.49 ACRES
5.11 ACRES
1.63 ACRES
0.10 ACRES
4.23 ACRES
0.34 ACRES
1.04 ACRES
29.80 ACRES
0.48 ACRES
18.0 ACRES
0.34 ACRES
0.24 ACRES
1.88 ACRES
16.44 ACRES
0.61 ACRES
0.38 ACRES

PENASQUITOS DR
PENASQUITOS DRIVE
JANAL WAY
CUCA ST.
CARMEL MTN. RD.
DEL DIABLO LN
DEL DIABLO ST
DEL DIABLO WAY
SANTANAS ST.
MADRIGAL ST.
ANDORRA WAY
INTERSTATE HWY 15

LEGEND
PROJECT BOUNDARY
DRAINAGE BOUNDARY
INTIAL SUBAREA
FLOW DIRECTION
AREA
HYDROLOGIC SOIL TYPE
NODE NUMBER

4S RANCH
RANCHO BERNARDO
RANCHO PENASQUITOS
BLK. MTN. RANCH
SITE
15

VICINITY MAP
NOT TO SCALE

0 220 440 660
SCALE 1" =220'

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EXISTING
DRAINAGE MAP
THE JUNIPERS
CITY OF SAN DIEGO, CALIFORNIA

MAP 1 OF 1

W.O.# 3356-0001

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100 YEAR EXISTING CONDITIONS HYDROLOGY ANALYSIS

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1239

                            Analysis prepared by:

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


 ************************* DESCRIPTION OF STUDY *************************
* THE JUNIPERS (DLN# 1286)                                              *
* 100 YEAR EXISTING CONDITIONS                                          *
* BY: ADAM BROOKS                                                       *
 **************************************************************************

  FILE NAME: R:\1286\HYD\TM\CALCS\AES\PLANNING\EX-Q100.DAT
  TIME/DATE OF STUDY: 13:01 08/19/2019
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.900
  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   13.0      6.5    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0160
  2   15.0      7.5    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0130

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

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

**************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    104.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.00
  UPSTREAM ELEVATION(FEET) =    725.00
  DOWNSTREAM ELEVATION(FEET) =    682.00
  ELEVATION DIFFERENCE(FEET) =     43.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
```

```
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.605
  SUBAREA RUNOFF(CFS) =      2.40
  TOTAL AREA(ACRES) =      1.04   TOTAL RUNOFF(CFS) =      2.40

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    106.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    682.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   987.00   CHANNEL SLOPE =  0.0274
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.40
  FLOW VELOCITY(FEET/SEC) =   2.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.56   Tc(MIN.) =   11.82
  LONGEST FLOWPATH FROM NODE    102.00 TO NODE    106.00 =    1292.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.386
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   29.80   SUBAREA RUNOFF(CFS) =   45.74
  TOTAL AREA(ACRES) =       30.8   TOTAL RUNOFF(CFS) =      47.34
  TC(MIN.) =   11.82

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 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) =   660.00  DOWNSTREAM(FEET) =   621.00
  FLOW LENGTH(FEET) =  1273.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.03
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      47.34
  PIPE TRAVEL TIME(MIN.) =   1.41    Tc(MIN.) =   13.24
  LONGEST FLOWPATH FROM NODE    102.00 TO NODE    606.00 =    2565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    606.00 TO NODE    606.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.24
  RAINFALL INTENSITY(INCH/HR) =   4.08
  TOTAL STREAM AREA(ACRES) =    30.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     47.34

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    658.00
  DOWNSTREAM ELEVATION(FEET) =    656.00
```

```
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.846
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.53
  TOTAL AREA(ACRES) =      0.38   TOTAL RUNOFF(CFS) =      2.53

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    606.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  656.00  DOWNSTREAM ELEVATION(FEET) =  621.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.55
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.01
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =    4.29
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    0.61      SUBAREA RUNOFF(CFS) =    4.05
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       6.58

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.46
  FLOW VELOCITY(FEET/SEC.) =  6.49   DEPTH*VELOCITY(FT*FT/SEC.) =   2.05
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    606.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    606.00 TO NODE    606.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.29
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     0.99
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.58

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       47.34    13.24        4.078         30.84
      2        6.58     4.29        7.641          0.99

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       21.92     4.29       7.641
      2       50.85    13.24       4.078

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      50.85   Tc(MIN.) =   13.24
  TOTAL AREA(ACRES) =       31.8
  LONGEST FLOWPATH FROM NODE    102.00 TO NODE    606.00 =    2565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    204.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   192.00
  UPSTREAM ELEVATION(FEET) =    718.00
  DOWNSTREAM ELEVATION(FEET) =    705.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.136
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.074
  SUBAREA RUNOFF(CFS) =      0.51
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.51

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    206.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    705.00  DOWNSTREAM(FEET) =    682.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0687
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.51
  FLOW VELOCITY(FEET/SEC) =   3.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =    8.56
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    206.00 =     527.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    206.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.403
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.88   SUBAREA RUNOFF(CFS) =    3.56
  TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       4.01
  TC(MIN.) =    8.56

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    304.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    99.00
```

```
  UPSTREAM ELEVATION(FEET) =    738.00
  DOWNSTREAM ELEVATION(FEET) =    728.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.235
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.627
  SUBAREA RUNOFF(CFS) =      0.79
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      0.79

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    306.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    728.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   857.00   CHANNEL SLOPE =  0.1144
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.79
  FLOW VELOCITY(FEET/SEC) =   1.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.54   Tc(MIN.) =   13.78
  LONGEST FLOWPATH FROM NODE    302.00 TO NODE    306.00 =     956.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.974
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3598
  SUBAREA AREA(ACRES) =   16.44   SUBAREA RUNOFF(CFS) =   23.52
  TOTAL AREA(ACRES) =       16.8   TOTAL RUNOFF(CFS) =      23.99
  TC(MIN.) =   13.78

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

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    504.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   182.00
  UPSTREAM ELEVATION(FEET) =    804.00
  DOWNSTREAM ELEVATION(FEET) =    802.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.685
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.48
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.336
  SUBAREA RUNOFF(CFS) =      1.24
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      1.24

****************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    506.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  802.00  DOWNSTREAM ELEVATION(FEET) =  716.00
```

```
  STREET LENGTH(FEET) =  1798.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.41
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.54
    HALFSTREET FLOOD WIDTH(FEET) =   16.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.40
  STREET FLOW TRAVEL TIME(MIN.) =   2.97   Tc(MIN.) =    9.66
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.997
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
  SUBAREA AREA(ACRES) =   50.23      SUBAREA RUNOFF(CFS) =  158.14
  TOTAL AREA(ACRES) =       50.5        PEAK FLOW RATE(CFS) =     159.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  23.00
  FLOW VELOCITY(FEET/SEC.) = 12.21   DEPTH*VELOCITY(FT*FT/SEC.) =   8.06
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1798.0 FT WITH ELEVATION-DROP =  86.0 FT, IS  241.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    506.00
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    506.00 =    1980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    506.00 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) =   716.00  DOWNSTREAM(FEET) =   700.00
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.14
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     159.11
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.74
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    507.00 =    2131.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    508.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    690.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.0400
  CHANNEL FLOW THRU SUBAREA(CFS) =     159.11
  FLOW VELOCITY(FEET/SEC) =  10.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.38   Tc(MIN.) =   10.12
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    508.00 =    2381.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    508.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

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

```
  FLOW PROCESS FROM NODE    410.00 TO NODE    411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    758.00
  DOWNSTREAM ELEVATION(FEET) =    755.50
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.655
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    84.41
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.39
  TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      2.39

****************************************************************************
  FLOW PROCESS FROM NODE    411.00 TO NODE    412.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  755.50  DOWNSTREAM ELEVATION(FEET) =  736.00
  STREET LENGTH(FEET) =  1042.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      17.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.56
  STREET FLOW TRAVEL TIME(MIN.) =   4.77   Tc(MIN.) =    7.43
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.920
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    5.74      SUBAREA RUNOFF(CFS) =   29.56
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      31.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  19.33
  FLOW VELOCITY(FEET/SEC.) =  4.21   DEPTH*VELOCITY(FT*FT/SEC.) =   2.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1042.0 FT WITH ELEVATION-DROP =  19.5 FT, IS   38.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    412.00
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    412.00 =    1127.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    413.00 TO NODE    412.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.920
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8051
  SUBAREA AREA(ACRES) =    0.87   SUBAREA RUNOFF(CFS) =    1.80
  TOTAL AREA(ACRES) =        7.0   TOTAL RUNOFF(CFS) =      33.22
  TC(MIN.) =    7.43

****************************************************************************
  FLOW PROCESS FROM NODE    414.00 TO NODE    412.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.920
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6054
  SUBAREA AREA(ACRES) =    5.45   SUBAREA RUNOFF(CFS) =   11.29
  TOTAL AREA(ACRES) =       12.4   TOTAL RUNOFF(CFS) =      44.51
  TC(MIN.) =    7.43

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    508.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    736.00  DOWNSTREAM(FEET) =    690.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   804.00   CHANNEL SLOPE =  0.0572
  CHANNEL FLOW THRU SUBAREA(CFS) =      44.51
  FLOW VELOCITY(FEET/SEC) =   8.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =    8.92
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    508.00 =    1931.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    508.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.259
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5288
  SUBAREA AREA(ACRES) =    5.32   SUBAREA RUNOFF(CFS) =    9.79
  TOTAL AREA(ACRES) =       17.7   TOTAL RUNOFF(CFS) =      49.33
  TC(MIN.) =    8.92

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    508.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       49.33     8.92       5.259       17.74
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    508.00 =    1931.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      159.11    10.12       4.850       50.54
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    508.00 =    2381.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     189.67       8.92        5.259
      2     204.61      10.12        4.850
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     204.61   Tc(MIN.) =   10.12
  TOTAL AREA(ACRES) =       68.3

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    508.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    460.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    690.00  DOWNSTREAM(FEET) =    670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   419.00   CHANNEL SLOPE =  0.0477
  CHANNEL FLOW THRU SUBAREA(CFS) =     204.61
  FLOW VELOCITY(FEET/SEC) =  12.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.54   Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    460.00 =    2800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    460.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.689
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5862
  SUBAREA AREA(ACRES) =    5.07   SUBAREA RUNOFF(CFS) =    8.32
  TOTAL AREA(ACRES) =       73.3   TOTAL RUNOFF(CFS) =     204.61
  TC(MIN.) =   10.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    460.00 TO NODE    460.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    420.00 TO NODE    421.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    740.00
  DOWNSTREAM ELEVATION(FEET) =    738.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.758
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    78.53
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.59
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      2.59

****************************************************************************
  FLOW PROCESS FROM NODE    421.00 TO NODE    415.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
```

```
================================================================================
  UPSTREAM ELEVATION(FEET) =  768.00  DOWNSTREAM ELEVATION(FEET) =  710.00
  STREET LENGTH(FEET) =   831.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      21.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.40
  STREET FLOW TRAVEL TIME(MIN.) =   2.18   Tc(MIN.) =    4.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    5.74      SUBAREA RUNOFF(CFS) =   38.16
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      40.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.24
  FLOW VELOCITY(FEET/SEC.) =  7.39   DEPTH*VELOCITY(FT*FT/SEC.) =   3.34
  LONGEST FLOWPATH FROM NODE    420.00 TO NODE    415.00 =     916.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    422.00 TO NODE    415.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7030
  SUBAREA AREA(ACRES) =    2.90   SUBAREA RUNOFF(CFS) =    7.76
  TOTAL AREA(ACRES) =        9.0   TOTAL RUNOFF(CFS) =      48.50
  TC(MIN.) =    4.94

****************************************************************************
  FLOW PROCESS FROM NODE    415.00 TO NODE    460.00 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) =   670.00
  FLOW LENGTH(FEET) =   459.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.71
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.50
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    5.28
  LONGEST FLOWPATH FROM NODE    420.00 TO NODE    460.00 =    1375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    460.00 TO NODE    460.00 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       48.50     5.28       7.381        9.03
  LONGEST FLOWPATH FROM NODE    420.00 TO NODE    460.00 =    1375.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      204.61    10.66       4.689       73.35
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    460.00 =    2800.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     149.78       5.28        7.381
      2     235.42      10.66        4.689

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     235.42   Tc(MIN.) =   10.66
  TOTAL AREA(ACRES) =       82.4

****************************************************************************
  FLOW PROCESS FROM NODE    460.00 TO NODE    460.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
  ***MEMORY BANK #  3 IS EMPTY AND CAN NOT BE
     CONFLUENCED WITH THE MAIN-STREAM MEMORY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE    460.00 TO NODE    460.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    460.00 TO NODE    460.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
                          ********************
                **ALL MEMORY BANKS ARE EMPTY - PROCESS IGNORED.**
                          ********************

****************************************************************************
  FLOW PROCESS FROM NODE    460.00 TO NODE    470.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    670.00  DOWNSTREAM(FEET) =    664.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   178.91   CHANNEL SLOPE =  0.0335
  CHANNEL FLOW THRU SUBAREA(CFS) =     235.42
  FLOW VELOCITY(FEET/SEC) =  11.30 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   10.92
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    470.00 =    2978.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    470.00 TO NODE    470.00 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.) =   10.92
  RAINFALL INTENSITY(INCH/HR) =   4.62
  TOTAL STREAM AREA(ACRES) =    82.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    235.42

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

```
 FLOW PROCESS FROM NODE    461.00 TO NODE    462.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
 UPSTREAM ELEVATION(FEET) =    740.00
 DOWNSTREAM ELEVATION(FEET) =    720.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.961
 SUBAREA RUNOFF(CFS) =      1.00
 TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      1.00

****************************************************************************
 FLOW PROCESS FROM NODE    462.00 TO NODE    470.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    720.00  DOWNSTREAM(FEET) =    664.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.1302
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       1.00
 FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =    7.29
 LONGEST FLOWPATH FROM NODE    461.00 TO NODE    470.00 =     515.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    462.00 TO NODE    470.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.992
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =    3.00   SUBAREA RUNOFF(CFS) =    6.29
 TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =       7.15
 TC(MIN.) =    7.29

****************************************************************************
 FLOW PROCESS FROM NODE    470.00 TO NODE    470.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.29
 RAINFALL INTENSITY(INCH/HR) =   5.99
 TOTAL STREAM AREA(ACRES) =     3.41
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.15

****************************************************************************
 FLOW PROCESS FROM NODE    430.00 TO NODE    431.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
 UPSTREAM ELEVATION(FEET) =    714.00
 DOWNSTREAM ELEVATION(FEET) =    711.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.507
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      2.33
 TOTAL AREA(ACRES) =      0.35   TOTAL RUNOFF(CFS) =      2.33

****************************************************************************
 FLOW PROCESS FROM NODE    431.00 TO NODE    423.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  711.00  DOWNSTREAM ELEVATION(FEET) =  700.00
 STREET LENGTH(FEET) =   324.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 99.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
 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) =       8.48
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.32
   HALFSTREET FLOOD WIDTH(FEET) =    9.88
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.87
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.25
 STREET FLOW TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =    3.90
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
 SUBAREA AREA(ACRES) =    1.85      SUBAREA RUNOFF(CFS) =   12.30
 TOTAL AREA(ACRES) =        2.2        PEAK FLOW RATE(CFS) =      14.62

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.45
 FLOW VELOCITY(FEET/SEC.) =  4.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.65
 LONGEST FLOWPATH FROM NODE    430.00 TO NODE    423.00 =     409.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    432.00 TO NODE    423.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7064
 SUBAREA AREA(ACRES) =    1.01   SUBAREA RUNOFF(CFS) =    2.70
 TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =      17.33
 TC(MIN.) =    3.90

****************************************************************************
 FLOW PROCESS FROM NODE    423.00 TO NODE    470.00 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) =   674.00
 FLOW LENGTH(FEET) =   383.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.06
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      17.33
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    4.30
  LONGEST FLOWPATH FROM NODE    430.00 TO NODE    470.00 =     792.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    470.00 TO NODE    470.00 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.) =    4.30
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     3.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      235.42    10.92        4.616         82.38
      2        7.15     7.29        5.992          3.41
      3       17.33     4.30        7.641          3.21

  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      114.22     4.30       7.641
      2      177.84     7.29       5.992
      3      251.40    10.92       4.616

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     251.40   Tc(MIN.) =   10.92
  TOTAL AREA(ACRES) =       89.0
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    470.00 =    2978.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    470.00 TO NODE    480.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    664.00  DOWNSTREAM(FEET) =    648.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   681.00   CHANNEL SLOPE =  0.0235
  CHANNEL FLOW THRU SUBAREA(CFS) =     251.40
  FLOW VELOCITY(FEET/SEC) =   9.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =   12.10
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    480.00 =    3659.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    480.00 TO NODE    480.00 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.) =   12.10
  RAINFALL INTENSITY(INCH/HR) =   4.32
  TOTAL STREAM AREA(ACRES) =    89.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    251.40

****************************************************************************
  FLOW PROCESS FROM NODE    471.00 TO NODE    472.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    740.00
  DOWNSTREAM ELEVATION(FEET) =    718.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.961
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE    472.00 TO NODE    480.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    718.00  DOWNSTREAM(FEET) =    648.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   894.00   CHANNEL SLOPE =  0.0783
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.97
  FLOW VELOCITY(FEET/SEC) =   4.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.55   Tc(MIN.) =    9.33
  LONGEST FLOWPATH FROM NODE    471.00 TO NODE    480.00 =     979.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    472.00 TO NODE    480.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.111
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   10.48   SUBAREA RUNOFF(CFS) =   18.75
  TOTAL AREA(ACRES) =       10.9   TOTAL RUNOFF(CFS) =      19.46
  TC(MIN.) =    9.33

****************************************************************************
  FLOW PROCESS FROM NODE    480.00 TO NODE    480.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.33
  RAINFALL INTENSITY(INCH/HR) =   5.11
  TOTAL STREAM AREA(ACRES) =    10.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.46

****************************************************************************
  FLOW PROCESS FROM NODE    440.00 TO NODE    441.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    708.00
  DOWNSTREAM ELEVATION(FEET) =    700.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.808
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.26
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      2.26

****************************************************************************
  FLOW PROCESS FROM NODE    441.00 TO NODE    433.00 IS CODE =  61
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  700.00  DOWNSTREAM ELEVATION(FEET) =  674.00
  STREET LENGTH(FEET) =   795.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      19.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.88
  STREET FLOW TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =    4.68
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    5.11      SUBAREA RUNOFF(CFS) =   33.97
  TOTAL AREA(ACRES) =        5.5        PEAK FLOW RATE(CFS) =      36.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.03
  FLOW VELOCITY(FEET/SEC.) =  5.37   DEPTH*VELOCITY(FT*FT/SEC.) =   2.62
  LONGEST FLOWPATH FROM NODE    440.00 TO NODE    433.00 =     880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    442.00 TO NODE    433.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7503
  SUBAREA AREA(ACRES) =    1.63   SUBAREA RUNOFF(CFS) =    4.36
  TOTAL AREA(ACRES) =        7.1   TOTAL RUNOFF(CFS) =      40.59
  TC(MIN.) =    4.68

****************************************************************************
  FLOW PROCESS FROM NODE    433.00 TO NODE    480.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   674.00  DOWNSTREAM(FEET) =   648.00
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      40.59
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    4.78
  LONGEST FLOWPATH FROM NODE    440.00 TO NODE    480.00 =    1031.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    480.00 TO NODE    480.00 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.) =    4.78
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     7.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      251.40    12.10        4.321         89.00
      2       19.46     9.33        5.111         10.88
      3       40.59     4.78        7.641          7.08

  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      192.73     4.78       7.641
      2      259.18     9.33       5.111
      3      290.81    12.10       4.321

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     290.81   Tc(MIN.) =   12.10
  TOTAL AREA(ACRES) =      107.0
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    480.00 =    3659.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    480.00 TO NODE    490.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    648.00  DOWNSTREAM(FEET) =    634.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   607.00   CHANNEL SLOPE =  0.0231
  CHANNEL FLOW THRU SUBAREA(CFS) =     290.81
  FLOW VELOCITY(FEET/SEC) =  10.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.01   Tc(MIN.) =   13.11
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    490.00 =    4266.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    490.00 TO NODE    490.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.11
  RAINFALL INTENSITY(INCH/HR) =   4.10
  TOTAL STREAM AREA(ACRES) =   106.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    290.81

****************************************************************************
  FLOW PROCESS FROM NODE    481.00 TO NODE    482.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    730.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.961
 SUBAREA RUNOFF(CFS) =      0.97
 TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
 FLOW PROCESS FROM NODE    482.00 TO NODE    490.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    720.00  DOWNSTREAM(FEET) =    636.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1593.00   CHANNEL SLOPE =  0.0527
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.97
 FLOW VELOCITY(FEET/SEC) =   3.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.71   Tc(MIN.) =   13.49
 LONGEST FLOWPATH FROM NODE    481.00 TO NODE    490.00 =    1678.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    482.00 TO NODE    490.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.029
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =   25.49   SUBAREA RUNOFF(CFS) =   35.95
 TOTAL AREA(ACRES) =       25.9   TOTAL RUNOFF(CFS) =      36.51
 TC(MIN.) =   13.49

****************************************************************************
 FLOW PROCESS FROM NODE    490.00 TO NODE    490.00 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.) =   13.49
 RAINFALL INTENSITY(INCH/HR) =   4.03
 TOTAL STREAM AREA(ACRES) =    25.89
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.51

****************************************************************************
 FLOW PROCESS FROM NODE    450.00 TO NODE    451.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
 UPSTREAM ELEVATION(FEET) =    680.00
 DOWNSTREAM ELEVATION(FEET) =    676.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.389
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.66
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
 FLOW PROCESS FROM NODE    451.00 TO NODE    443.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  676.00  DOWNSTREAM ELEVATION(FEET) =  654.00
 STREET LENGTH(FEET) =   665.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 99.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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(CS) =      14.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.64
  STREET FLOW TRAVEL TIME(MIN.) =   2.55   Tc(MIN.) =    4.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    4.23      SUBAREA RUNOFF(CFS) =   28.12
  TOTAL AREA(ACRES) =        4.3        PEAK FLOW RATE(CFS) =      28.78

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.45
  FLOW VELOCITY(FEET/SEC.) =  5.10   DEPTH*VELOCITY(FT*FT/SEC.) =   2.32
  LONGEST FLOWPATH FROM NODE    450.00 TO NODE    443.00 =     755.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    452.00 TO NODE    443.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8321
  SUBAREA AREA(ACRES) =    0.34   SUBAREA RUNOFF(CFS) =    0.91
  TOTAL AREA(ACRES) =        4.7   TOTAL RUNOFF(CFS) =      29.69
  TC(MIN.) =    4.94

****************************************************************************
  FLOW PROCESS FROM NODE    443.00 TO NODE    490.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   654.00  DOWNSTREAM(FEET) =   634.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.69
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    4.98
  LONGEST FLOWPATH FROM NODE    450.00 TO NODE    490.00 =     835.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    490.00 TO NODE    490.00 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.) =    4.98
```

```
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     4.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.69

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      290.81    13.11        4.103        106.96
      2       36.51    13.49        4.029         25.89
      3       29.69     4.98        7.641          4.67

  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      199.36     4.98       7.641
      2      342.24    13.11       4.103
      3      337.71    13.49       4.029

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     342.24   Tc(MIN.) =   13.11
  TOTAL AREA(ACRES) =      137.5
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    490.00 =    4266.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    490.00 TO NODE    406.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    634.00  DOWNSTREAM(FEET) =    620.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.00   CHANNEL SLOPE =  0.0230
  CHANNEL FLOW THRU SUBAREA(CFS) =     342.24
  FLOW VELOCITY(FEET/SEC) =  10.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   14.07
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    406.00 =    4875.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    406.00 TO NODE    406.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.07
  RAINFALL INTENSITY(INCH/HR) =   3.92
  TOTAL STREAM AREA(ACRES) =   137.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    342.24

****************************************************************************
  FLOW PROCESS FROM NODE    491.00 TO NODE    492.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    740.00
  DOWNSTREAM ELEVATION(FEET) =    720.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.778
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.961
  SUBAREA RUNOFF(CFS) =      1.17
  TOTAL AREA(ACRES) =      0.48   TOTAL RUNOFF(CFS) =      1.17

****************************************************************************
  FLOW PROCESS FROM NODE    492.00 TO NODE    406.00 IS CODE =  52
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    720.00  DOWNSTREAM(FEET) =    620.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1016.00   CHANNEL SLOPE =  0.0984
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.17
  FLOW VELOCITY(FEET/SEC) =   4.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE    491.00 TO NODE    406.00 =    1101.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    492.00 TO NODE    406.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.131
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   18.00   SUBAREA RUNOFF(CFS) =   32.32
  TOTAL AREA(ACRES) =       18.5   TOTAL RUNOFF(CFS) =      33.19
  TC(MIN.) =    9.27

****************************************************************************
  FLOW PROCESS FROM NODE    406.00 TO NODE    406.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   5.13
  TOTAL STREAM AREA(ACRES) =    18.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.19

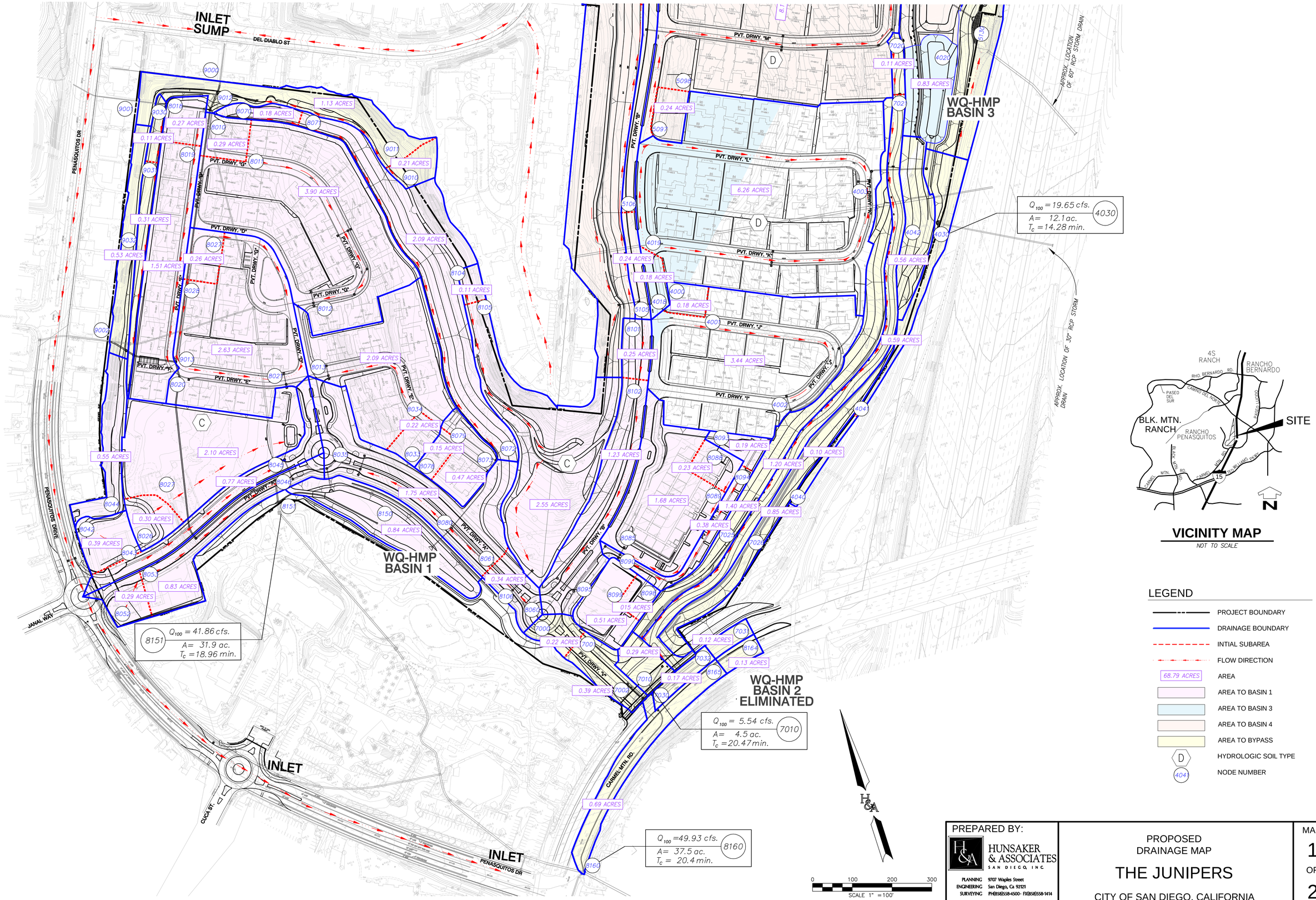
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      342.24    14.07        3.920        137.52
      2       33.19     9.27        5.131         18.48

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      294.65     9.27       5.131
      2      367.60    14.07       3.920

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     367.60   Tc(MIN.) =   14.07
  TOTAL AREA(ACRES) =      156.0
  LONGEST FLOWPATH FROM NODE    502.00 TO NODE    406.00 =    4875.91 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      156.0  TC(MIN.) =     14.07
  PEAK FLOW RATE(CFS)   =     367.60
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

DEVELOPED CONDITIONS



PREPARED BY:

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PROPOSED
DRAINAGE MAP

THE JUNIPERS

CITY OF SAN DIEGO, CALIFORNIA

MAP 1 OF 2

W.O.# 2167-0145

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SEE MAP 3 FOR CONTINUATION

SEE MAP 3 FOR CONTINUATION

SANTANAS ST.
SATANAS ST
DEL DIABLO ST.
DEL DIABLO ST
DEL DIABLO WAY
MADRIGAL ST
ANDORRA WAY
ANDORRA WAY
INTERSTATE HWY 15
PVT. DRWY. "A"
PVT. DRWY. "B"
PVT. DRWY. "B"
PVT. DRWY. "C"
PVT. DRWY. "M"
PVT. DRWY. "N"
PVT. DRWY. "O"
PVT. DRWY. "O"
PVT. DRWY. "O"
PVT. DRWY. "P"
PVT. DRWY. "P"
PVT. DRWY. "R"
PVT. DRWY. "R"
PVT. DRWY. "S"
PVT. DRWY. "T"
PVT. DRWY. "T"

0.16 ACRES
0.31 ACRES
0.09 ACRES
1.79 ACRES
0.40 ACRES
0.24 ACRES
0.64 ACRES
2.26 ACRES
0.18 ACRES
1.04 ACRES
1.28 ACRES
2.56 ACRES
7.62 ACRES
1.12 ACRES
0.63 ACRES
0.18 ACRES
0.34 ACRES
0.33 ACRES
0.84 ACRES
1.26 ACRES
0.95 ACRES
0.28 ACRES
0.29 ACRES
0.86 ACRES
0.22 ACRES
3.91 ACRES
1.43 ACRES
3.45 ACRES
0.32 ACRES
0.79 ACRES
1.85 ACRES
8.11 ACRES
2.60 ACRES
5.28 ACRES
2.14 ACRES
5.11 ACRES
1.01 ACRES
1.38 ACRES
3.28 ACRES
0.41 ACRES
0.33 ACRES
0.23 ACRES
1.89 ACRES
0.34 ACRES
0.39 ACRES
0.34 ACRES
2.92 ACRES
5.74 ACRES
0.35 ACRES
0.34 ACRES
1.63 ACRES
0.10 ACRES
1.72 ACRES
1.75 ACRES
0.11 ACRES
1.71 ACRES
4.23 ACRES
0.34 ACRES

OFFSITE DISCHARGE ONTO
0SITE PR Q100= 159.11 CFS

OFFSITE DISCHAR(
SITE PR Q100= 44.!

OFFSITE DISCHARGE ONTO
SITE PR Q100= 48.50 CFS

OFFSITE DISCHARGE ONTO
SITE PR Q100= 17.33 CFS

OFFSITE DISCHARGE ONTO
SITE PR Q100= 40.59 CFS

OFFSITE DISCHARGE ONTO
SITE PR Q100= 29.69 CFS

WQ-HMP
BASIN 4

Q_{100} = 342.32 cfs
A = 157.5 ac.
T_c = 18.48 min.
5130

APPROX. LOCATION
OF 60" RCP STORM DRAIN

4S RANCH
RANCHO BERNARDO
RHO. BERNARDO RD.
PASEO DEL SUR
CAMINO DEL NORTE
BLK. MTN. RANCH
RANCHO PENASQUITOS
SITE
BLACK MTN. RD.
CARMEL MTN. RD.
CARMEL MTN. RD.
SR-56
SR-56
I-15
N

VICINITY MAP
NOT TO SCALE

LEGEND

- PROJECT BOUNDARY
- DRAINAGE BOUNDARY
- INTIAL SUBAREA
- FLOW DIRECTION
- 68.79 ACRES — AREA
- AREA TO BASIN 1
- AREA TO BASIN 3
- AREA TO BASIN 4
- AREA TO BYPASS
- D — HYDROLOGIC SOIL TYPE
- 4041 — NODE NUMBER

0 100 200 300
SCALE 1" = 100'

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PROPOSED
DRAINAGE MAP

THE JUNIPERS

CITY OF SAN DIEGO, CALIFORNIA

MAP 2 OF 3

W.O.# 2167-0145

R:\1286\Hyd\TM\ACAD\1286 Hydrology Maps-Drainage-PR.dwg[]Aug-19-2019:14:27

SEE MAP 2 FOR CONTINUATION

DEL DIABLO WAY

MADRIGAL ST

ANDORRA WAY

PVT. DRWY. "O"

PVT. DRWY. "R"

PVT. DRWY. "S"

PVT. DRWY. "T"

INTERSTATE HWY 15

50.23 ACRES

0.31 ACRES

0.40 ACRES

0.24 ACRES

0.64 ACRES

0.18 ACRES

2.26 ACRES

1.28 ACRES

1.04 ACRES

1.38 ACRES

0.33 ACRES

2.56 ACRES

3.28 ACRES

0.41 ACRES

0.34 ACRES

0.29 ACRES

0.28 ACRES

1.26 ACRES

0.86 ACRES

0.34 ACRES

0.33 ACRES

0.84 ACRES

0.95 ACRES

0.22 ACRES

1.43 ACRES

3.45 ACRES

0.32 ACRES

0.79 ACRES

2.92 ACRES

5.74 ACRES

0.23 ACRES

1.89 ACRES

0.34 ACRES

0.33 ACRES

0.39 ACRES

0.36 ACRES

1.07 ACRES

5.74 ACRES

5.45 ACRES

2.90 ACRES

1.85 ACRES

0.35 ACRES

0.34 ACRES

1.01 ACRES

2.14 ACRES

5.11 ACRES

0.10 ACRES

1.63 ACRES

4.23 ACRES

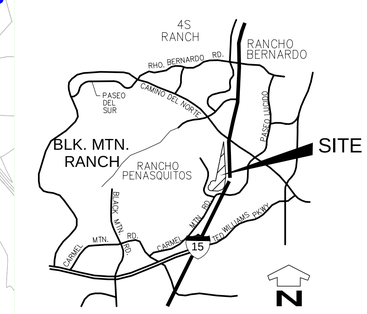
OFFSITE DISCHARGE ONTO 0SITE PR Q100= 159.11 CFS

OFFSITE DISCHARGE ONTO SITE PR Q100= 44.51 CFS

OFFSITE DISCHARGE ONTO SITE PR Q100= 48.50 CFS

OFFSITE DISCHARGE ONTO SITE PR Q100= 17.33 CFS

OFFSITE DISCHARGE ONTO SITE PR Q100= 40.59 CFS



VICINITY MAP

NOT TO SCALE

LEGEND

- PROJECT BOUNDARY
- DRAINAGE BOUNDARY
- INTIAL SUBAREA
- FLOW DIRECTION
- 68.79 ACRES — AREA
- AREA TO BASIN 1
- AREA TO BASIN 3
- AREA TO BASIN 4
- AREA TO BYPASS
- D — HYDROLOGIC SOIL TYPE
- 404 — NODE NUMBER

0 100 200 300

SCALE 1" = 100'

PREPARED BY:

HUNSAKER & ASSOCIATES SAN DIEGO, INC

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PROPOSED DRAINAGE MAP

THE JUNIPERS

CITY OF SAN DIEGO, CALIFORNIA

MAP 3 OF 3

W.O.# 2167-0145

R:\1286\Hyd\TM\ACAD\1286 Hydrology Maps-Drainage-PR.dwg[]Aug-19-2019:13:54

100 YEAR DEVELOPED CONDITIONS HYDROLOGY ANALYSIS

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1239

                            Analysis prepared by:

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


 ************************** DESCRIPTION OF STUDY **************************
* THE JUNIPERS (DLN# 1286)                                                *
* 100 YEAR PROPOSED CONDITIONS                                            *
* BY ADAM BROOKS                                                          *
 ************************************************************************

  FILE NAME: R:\1286\HYD\TM\CALCS\AES\PLANNING\PR-Q100.DAT
  TIME/DATE OF STUDY: 12:21 08/15/2019
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.900
  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   13.0      6.5    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0160
  2   15.0      7.5    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0130
  3   15.0      7.5    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0130

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

************************************************************************
  FLOW PROCESS FROM NODE   6000.00 TO NODE   6002.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   182.00
  UPSTREAM ELEVATION(FEET) =    804.00
  DOWNSTREAM ELEVATION(FEET) =    802.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.685
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.48
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.336
  SUBAREA RUNOFF(CFS) =      1.24
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      1.24
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   6002.00 TO NODE   6004.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  802.00  DOWNSTREAM ELEVATION(FEET) =  716.00
  STREET LENGTH(FEET) =  1798.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.41
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.54
    HALFSTREET FLOOD WIDTH(FEET) =   16.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.40
  STREET FLOW TRAVEL TIME(MIN.) =   2.97   Tc(MIN.) =    9.66
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.997
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
  SUBAREA AREA(ACRES) =   50.23      SUBAREA RUNOFF(CFS) =  158.14
  TOTAL AREA(ACRES) =       50.5        PEAK FLOW RATE(CFS) =     159.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  23.00
  FLOW VELOCITY(FEET/SEC.) = 12.21   DEPTH*VELOCITY(FT*FT/SEC.) =   8.06
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1798.0 FT WITH ELEVATION-DROP =  86.0 FT, IS  241.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   6004.00
  LONGEST FLOWPATH FROM NODE   6000.00 TO NODE   6004.00 =    1980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6004.00 TO NODE   6005.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   716.00  DOWNSTREAM(FEET) =   702.40
  FLOW LENGTH(FEET) =   152.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.68
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     159.11
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.74
  LONGEST FLOWPATH FROM NODE   6000.00 TO NODE   6005.00 =    2132.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6005.00 TO NODE   6005.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.74
  RAINFALL INTENSITY(INCH/HR) =   4.97
  TOTAL STREAM AREA(ACRES) =    50.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    159.11
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   6010.00 TO NODE   6011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   134.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    730.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.605
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE   6011.00 TO NODE   6005.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    730.00  DOWNSTREAM(FEET) =    702.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   495.00   CHANNEL SLOPE =  0.0558
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.075   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.705
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.90
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   4.34
  Tc(MIN.) =   10.60
  SUBAREA AREA(ACRES) =     1.38       SUBAREA RUNOFF(CFS) =    2.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.6         PEAK FLOW RATE(CFS) =       2.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   2.16
  LONGEST FLOWPATH FROM NODE   6010.00 TO NODE   6005.00 =     629.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6005.00 TO NODE   6005.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.60
  RAINFALL INTENSITY(INCH/HR) =   4.71
  TOTAL STREAM AREA(ACRES) =     1.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.65

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      159.11     9.74        4.970         50.54
      2        2.65    10.60        4.705          1.61

  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      161.55     9.74       4.970
      2      153.30    10.60       4.705

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     161.55   Tc(MIN.) =    9.74
  TOTAL AREA(ACRES) =       52.2
  LONGEST FLOWPATH FROM NODE   6000.00 TO NODE   6005.00 =    2132.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6005.00 TO NODE   6012.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   702.40  DOWNSTREAM(FEET) =   688.00
  FLOW LENGTH(FEET) =   155.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.25
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     161.55
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.82
  LONGEST FLOWPATH FROM NODE   6000.00 TO NODE   6012.00 =    2287.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6012.00 TO NODE   6012.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.82
  RAINFALL INTENSITY(INCH/HR) =   4.94
  TOTAL STREAM AREA(ACRES) =    52.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    161.55

****************************************************************************
  FLOW PROCESS FROM NODE   3010.00 TO NODE   3011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    758.00
  DOWNSTREAM ELEVATION(FEET) =    755.50
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.655
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    84.41
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.39
  TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      2.39

****************************************************************************
  FLOW PROCESS FROM NODE   3011.00 TO NODE   3012.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  755.50  DOWNSTREAM ELEVATION(FEET) =  736.00
  STREET LENGTH(FEET) =  1042.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      17.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.56
  STREET FLOW TRAVEL TIME(MIN.) =   4.77   Tc(MIN.) =    7.43
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.920
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    5.74      SUBAREA RUNOFF(CFS) =   29.56
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      31.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  19.33
  FLOW VELOCITY(FEET/SEC.) =  4.21   DEPTH*VELOCITY(FT*FT/SEC.) =   2.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1042.0 FT WITH ELEVATION-DROP =  19.5 FT, IS   38.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3012.00
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   3012.00 =    1127.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3013.00 TO NODE   3012.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.920
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6246
  SUBAREA AREA(ACRES) =    5.45   SUBAREA RUNOFF(CFS) =   11.29
  TOTAL AREA(ACRES) =       11.5   TOTAL RUNOFF(CFS) =      42.71
  TC(MIN.) =    7.43

****************************************************************************
  FLOW PROCESS FROM NODE   3014.00 TO NODE   3012.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.920
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6054
  SUBAREA AREA(ACRES) =    0.87   SUBAREA RUNOFF(CFS) =    1.80
  TOTAL AREA(ACRES) =       12.4   TOTAL RUNOFF(CFS) =      44.51
  TC(MIN.) =    7.43

****************************************************************************
  FLOW PROCESS FROM NODE   3012.00 TO NODE   6012.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   736.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =  1204.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.49
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      44.51
  PIPE TRAVEL TIME(MIN.) =   1.09    Tc(MIN.) =    8.51
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6012.00 =    2331.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   6012.00 TO NODE   6012.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.51
  RAINFALL INTENSITY(INCH/HR) =   5.42
  TOTAL STREAM AREA(ACRES) =    12.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.51

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      161.55     9.82        4.943         52.15
      2       44.51     8.51        5.421         12.42

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      191.81     8.51       5.421
      2      202.13     9.82       4.943

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     202.13   Tc(MIN.) =    9.82
  TOTAL AREA(ACRES) =       64.6
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6012.00 =    2331.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6012.00 TO NODE   6027.00 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) =   656.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  39.23
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     202.13
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    9.95
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6027.00 =    2631.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6027.00 TO NODE   6027.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.95
  RAINFALL INTENSITY(INCH/HR) =   4.90
  TOTAL STREAM AREA(ACRES) =    64.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    202.13

****************************************************************************
  FLOW PROCESS FROM NODE   6025.00 TO NODE   6026.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  UPSTREAM ELEVATION(FEET) =    760.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    755.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.038
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.216
  SUBAREA RUNOFF(CFS) =      0.60
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      0.60

****************************************************************************
  FLOW PROCESS FROM NODE   6026.00 TO NODE   6027.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   941.00   CHANNEL SLOPE =  0.0531
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.075   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.987
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.26
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =  12.41
  Tc(MIN.) =   21.45
  SUBAREA AREA(ACRES) =     1.89       SUBAREA RUNOFF(CFS) =    1.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.2         PEAK FLOW RATE(CFS) =       2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   1.41
  LONGEST FLOWPATH FROM NODE   6025.00 TO NODE   6027.00 =    1091.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6027.00 TO NODE   6027.00 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.) =   21.45
  RAINFALL INTENSITY(INCH/HR) =   2.99
  TOTAL STREAM AREA(ACRES) =     2.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.32

****************************************************************************
  FLOW PROCESS FROM NODE   3020.00 TO NODE   3021.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    740.00
  DOWNSTREAM ELEVATION(FEET) =    738.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.758
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    78.53
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.59
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      2.59
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3021.00 TO NODE   3022.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  768.00  DOWNSTREAM ELEVATION(FEET) =  710.00
  STREET LENGTH(FEET) =   831.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      21.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.40
  STREET FLOW TRAVEL TIME(MIN.) =   2.18   Tc(MIN.) =    4.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    5.74      SUBAREA RUNOFF(CFS) =   38.16
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      40.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.24
  FLOW VELOCITY(FEET/SEC.) =  7.39   DEPTH*VELOCITY(FT*FT/SEC.) =   3.34
  LONGEST FLOWPATH FROM NODE   3020.00 TO NODE   3022.00 =     916.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3023.00 TO NODE   3022.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7030
  SUBAREA AREA(ACRES) =    2.90   SUBAREA RUNOFF(CFS) =    7.76
  TOTAL AREA(ACRES) =        9.0   TOTAL RUNOFF(CFS) =      48.50
  TC(MIN.) =    4.94

****************************************************************************
  FLOW PROCESS FROM NODE   3022.00 TO NODE   6027.00 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) =   700.00
  FLOW LENGTH(FEET) =    91.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.22
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.50
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    5.00
  LONGEST FLOWPATH FROM NODE   3020.00 TO NODE   6027.00 =    1007.00 FEET.

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

```
  FLOW PROCESS FROM NODE   6027.00 TO NODE   6027.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.00
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     9.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     48.50

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      202.13     9.95        4.902         64.57
      2        2.32    21.45        2.987          2.22
      3       48.50     5.00        7.639          9.03

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      178.74     5.00       7.639
      2      234.33     9.95       4.902
      3      144.44    21.45       2.987

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     234.33   Tc(MIN.) =    9.95
  TOTAL AREA(ACRES) =       75.8
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6027.00 =    2631.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6027.00 TO NODE   6013.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    695.00  DOWNSTREAM(FEET) =    685.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   317.00   CHANNEL SLOPE =  0.0315
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.075   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.624
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     234.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.61
  AVERAGE FLOW DEPTH(FEET) =   3.32   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =   10.89
  SUBAREA AREA(ACRES) =     0.79       SUBAREA RUNOFF(CFS) =    1.28
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.618
  TOTAL AREA(ACRES) =       76.6         PEAK FLOW RATE(CFS) =     234.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =   5.60
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6013.00 =    2948.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6013.00 TO NODE   6013.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.89
  RAINFALL INTENSITY(INCH/HR) =   4.62
  TOTAL STREAM AREA(ACRES) =    76.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    234.33
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3030.00 TO NODE   3031.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    714.00
  DOWNSTREAM ELEVATION(FEET) =    711.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.507
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.33
  TOTAL AREA(ACRES) =      0.35   TOTAL RUNOFF(CFS) =      2.33

****************************************************************************
  FLOW PROCESS FROM NODE   3031.00 TO NODE   6013.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  711.00  DOWNSTREAM ELEVATION(FEET) =  700.00
  STREET LENGTH(FEET) =   324.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =       8.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.25
  STREET FLOW TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =    3.90
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    1.85      SUBAREA RUNOFF(CFS) =   12.30
  TOTAL AREA(ACRES) =        2.2        PEAK FLOW RATE(CFS) =      14.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.45
  FLOW VELOCITY(FEET/SEC.) =  4.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.65
  LONGEST FLOWPATH FROM NODE   3030.00 TO NODE   6013.00 =     409.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3033.00 TO NODE   6013.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7064
  SUBAREA AREA(ACRES) =    1.01   SUBAREA RUNOFF(CFS) =    2.70
```

```
  TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =      17.33
  TC(MIN.) =    3.90

****************************************************************************
  FLOW PROCESS FROM NODE   6013.00 TO NODE   6013.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.90
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     3.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      234.33    10.89        4.624         76.61
      2       17.33     3.90        7.641          3.21

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      159.14     3.90       7.641
      2      244.82    10.89       4.624

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     244.82   Tc(MIN.) =   10.89
  TOTAL AREA(ACRES) =       79.8
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6013.00 =    2948.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6013.00 TO NODE   6040.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   811.00   CHANNEL SLOPE =  0.0370
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.075   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.100
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     246.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.05
  AVERAGE FLOW DEPTH(FEET) =   3.43   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   13.12
  SUBAREA AREA(ACRES) =     2.14       SUBAREA RUNOFF(CFS) =    3.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.614
  TOTAL AREA(ACRES) =       82.0         PEAK FLOW RATE(CFS) =     244.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.42   FLOW VELOCITY(FEET/SEC.) =   6.04
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6040.00 =    3759.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6040.00 TO NODE   6040.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.12
  RAINFALL INTENSITY(INCH/HR) =   4.10
```

```
  TOTAL STREAM AREA(ACRES) =    81.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    244.82

****************************************************************************
  FLOW PROCESS FROM NODE   3040.00 TO NODE   3041.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    708.00
  DOWNSTREAM ELEVATION(FEET) =    700.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.808
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.26
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      2.26

****************************************************************************
  FLOW PROCESS FROM NODE   3041.00 TO NODE   6040.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  700.00  DOWNSTREAM ELEVATION(FEET) =  674.00
  STREET LENGTH(FEET) =   795.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      19.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.88
  STREET FLOW TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =    4.68
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    5.11      SUBAREA RUNOFF(CFS) =   33.97
  TOTAL AREA(ACRES) =        5.5        PEAK FLOW RATE(CFS) =      36.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.03
  FLOW VELOCITY(FEET/SEC.) =  5.37   DEPTH*VELOCITY(FT*FT/SEC.) =   2.62
  LONGEST FLOWPATH FROM NODE   3040.00 TO NODE   6040.00 =     880.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3043.00 TO NODE   6040.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7503
  SUBAREA AREA(ACRES) =    1.63   SUBAREA RUNOFF(CFS) =    4.36
  TOTAL AREA(ACRES) =        7.1   TOTAL RUNOFF(CFS) =      40.59
  TC(MIN.) =    4.68

****************************************************************************
  FLOW PROCESS FROM NODE   6040.00 TO NODE   6040.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.68
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     7.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      244.82    13.12        4.100         81.96
      2       40.59     4.68        7.641          7.08

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      171.96     4.68       7.641
      2      266.60    13.12       4.100

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     266.60   Tc(MIN.) =   13.12
  TOTAL AREA(ACRES) =       89.0
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6040.00 =    3759.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6040.00 TO NODE   6050.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    670.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.0231
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.075   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.727
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.17
  AVERAGE FLOW DEPTH(FEET) =   3.80   TRAVEL TIME(MIN.) =   2.09
  Tc(MIN.) =   15.22
  SUBAREA AREA(ACRES) =     1.72       SUBAREA RUNOFF(CFS) =    2.24
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.620
  TOTAL AREA(ACRES) =       90.8         PEAK FLOW RATE(CFS) =     266.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.80   FLOW VELOCITY(FEET/SEC.) =   5.17
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6050.00 =    4409.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6050.00 TO NODE   6050.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   15.22
  RAINFALL INTENSITY(INCH/HR) =   3.73
  TOTAL STREAM AREA(ACRES) =    90.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    266.60

****************************************************************************
  FLOW PROCESS FROM NODE   3050.00 TO NODE   3051.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =    680.00
  DOWNSTREAM ELEVATION(FEET) =    676.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.389
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE   3051.00 TO NODE   6050.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  676.00  DOWNSTREAM ELEVATION(FEET) =  654.00
  STREET LENGTH(FEET) =   665.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 99.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  45.00
  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) =      14.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.64
  STREET FLOW TRAVEL TIME(MIN.) =   2.55   Tc(MIN.) =    4.94
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    4.23      SUBAREA RUNOFF(CFS) =   28.12
  TOTAL AREA(ACRES) =        4.3        PEAK FLOW RATE(CFS) =      28.78

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.45
  FLOW VELOCITY(FEET/SEC.) =  5.10   DEPTH*VELOCITY(FT*FT/SEC.) =   2.32
  LONGEST FLOWPATH FROM NODE   3050.00 TO NODE   6050.00 =     755.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3053.00 TO NODE   6050.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8321
  SUBAREA AREA(ACRES) =    0.34   SUBAREA RUNOFF(CFS) =    0.91
  TOTAL AREA(ACRES) =        4.7   TOTAL RUNOFF(CFS) =      29.69
  TC(MIN.) =    4.94

****************************************************************************
  FLOW PROCESS FROM NODE   6050.00 TO NODE   6050.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.94
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     4.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.69

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      266.60    15.22        3.727         90.76
      2       29.69     4.94        7.641          4.67

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      159.72     4.94       7.641
      2      281.08    15.22       3.727

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     281.08   Tc(MIN.) =   15.22
  TOTAL AREA(ACRES) =       95.4
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   6050.00 =    4409.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   6050.00 TO NODE   5130.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    650.00  DOWNSTREAM(FEET) =    617.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1123.00   CHANNEL SLOPE =  0.0294
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.075   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.288
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     282.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.73
  AVERAGE FLOW DEPTH(FEET) =   3.68   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   18.48
  SUBAREA AREA(ACRES) =     1.71       SUBAREA RUNOFF(CFS) =    1.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.625
  TOTAL AREA(ACRES) =       97.1         PEAK FLOW RATE(CFS) =     281.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.67   FLOW VELOCITY(FEET/SEC.) =   5.73
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   5130.00 =    5532.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5130.00 TO NODE   5130.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   5000.00 TO NODE   5001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   145.00
  UPSTREAM ELEVATION(FEET) =    710.00
  DOWNSTREAM ELEVATION(FEET) =    700.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.445
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.97
  TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      1.97

****************************************************************************
  FLOW PROCESS FROM NODE   5001.00 TO NODE   5002.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  700.00  DOWNSTREAM ELEVATION(FEET) =  691.00
  STREET LENGTH(FEET) =   837.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.26
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.43   FLOOD WIDTH(FEET) =   15.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    3.39
    SPLIT DEPTH(FEET) =    0.16   SPLIT FLOOD WIDTH(FEET) =    1.55
    SPLIT FLOW(CFS) =    0.23   SPLIT VELOCITY(FEET/SEC.) =    1.63
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.45
  STREET FLOW TRAVEL TIME(MIN.) =   4.11   Tc(MIN.) =    8.56
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.403
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.701
  SUBAREA AREA(ACRES) =    3.28      SUBAREA RUNOFF(CFS) =   12.58
  TOTAL AREA(ACRES) =        3.7        PEAK FLOW RATE(CFS) =      13.98

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  3.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.45
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5002.00 =     982.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5004.00 TO NODE   5002.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.403
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6715
 SUBAREA AREA(ACRES) =    0.34   SUBAREA RUNOFF(CFS) =    0.64
 TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =      14.62
 TC(MIN.) =    8.56

****************************************************************************
 FLOW PROCESS FROM NODE   5002.00 TO NODE   5003.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   691.00  DOWNSTREAM(FEET) =   687.00
 FLOW LENGTH(FEET) =   154.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.55
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      14.62
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    8.80
 LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5003.00 =    1136.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   5003.00 TO NODE   5003.00 IS 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) =   5.31
 TOTAL STREAM AREA(ACRES) =     4.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.62

****************************************************************************
 FLOW PROCESS FROM NODE   5005.00 TO NODE   5006.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    745.00
 DOWNSTREAM ELEVATION(FEET) =    740.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.691
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   5006.00 TO NODE   5003.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    695.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   324.00   CHANNEL SLOPE =  0.1389
 CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.355
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.92
 AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   0.78
```

```
  Tc(MIN.) =    8.68
  SUBAREA AREA(ACRES) =     1.04       SUBAREA RUNOFF(CFS) =    1.95
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       2.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   8.57
  LONGEST FLOWPATH FROM NODE   5005.00 TO NODE   5003.00 =     424.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5003.00 TO NODE   5003.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.68
  RAINFALL INTENSITY(INCH/HR) =   5.35
  TOTAL STREAM AREA(ACRES) =     1.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.29

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.62     8.80        5.306          4.03
      2        2.29     8.68        5.355          1.22

  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       16.70     8.68       5.355
      2       16.89     8.80       5.306

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.89   Tc(MIN.) =    8.80
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5003.00 =    1136.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5003.00 TO NODE   5007.00 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) =   684.00
  FLOW LENGTH(FEET) =   354.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.37
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.89
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    9.43
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5007.00 =    1490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5007.00 TO NODE   5007.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.43
  RAINFALL INTENSITY(INCH/HR) =   5.07
  TOTAL STREAM AREA(ACRES) =     5.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.89

****************************************************************************
  FLOW PROCESS FROM NODE   5010.00 TO NODE   5011.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    692.00
  DOWNSTREAM ELEVATION(FEET) =    691.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE   5011.00 TO NODE   5007.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  688.00  DOWNSTREAM ELEVATION(FEET) =  684.00
  STREET LENGTH(FEET) =   236.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.95
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.50
  STREET FLOW TRAVEL TIME(MIN.) =   1.01   Tc(MIN.) =    6.45
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.487
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.639
  SUBAREA AREA(ACRES) =    2.56      SUBAREA RUNOFF(CFS) =   10.46
  TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =      11.98

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  4.26   DEPTH*VELOCITY(FT*FT/SEC.) =   1.82
  LONGEST FLOWPATH FROM NODE   5010.00 TO NODE   5007.00 =     321.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5007.00 TO NODE   5007.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.45
  RAINFALL INTENSITY(INCH/HR) =   6.49
  TOTAL STREAM AREA(ACRES) =     2.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.98
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.89     9.43        5.075         5.25
      2       11.98     6.45        6.487         2.89

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       25.19     6.45       6.487
      2       26.26     9.43       5.075

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.26   Tc(MIN.) =    9.43
  TOTAL AREA(ACRES) =        8.1
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5007.00 =    1490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5007.00 TO NODE   5012.00 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) =   680.00
  FLOW LENGTH(FEET) =   183.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.63
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.26
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    9.67
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5012.00 =    1673.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5012.00 TO NODE   5012.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.67
  RAINFALL INTENSITY(INCH/HR) =   4.99
  TOTAL STREAM AREA(ACRES) =     8.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.26

****************************************************************************
  FLOW PROCESS FROM NODE   5015.00 TO NODE   5016.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    690.00
  DOWNSTREAM ELEVATION(FEET) =    689.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.44
  TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      1.44

****************************************************************************
  FLOW PROCESS FROM NODE   5016.00 TO NODE   5012.00 IS CODE =  62
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  689.00  DOWNSTREAM ELEVATION(FEET) =  679.00
  STREET LENGTH(FEET) =   381.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.14
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.89
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
  STREET FLOW TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =    7.25
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.012
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    1.26      SUBAREA RUNOFF(CFS) =    5.38
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       6.57

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.53
  FLOW VELOCITY(FEET/SEC.) =  3.89   DEPTH*VELOCITY(FT*FT/SEC.) =   1.15
  LONGEST FLOWPATH FROM NODE   5015.00 TO NODE   5012.00 =     466.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5012.00 TO NODE   5012.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.25
  RAINFALL INTENSITY(INCH/HR) =   6.01
  TOTAL STREAM AREA(ACRES) =     1.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.57

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.26     9.67        4.992          8.14
      2        6.57     7.25        6.012          1.54

  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       28.38     7.25       6.012
      2       31.72     9.67       4.992

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.72   Tc(MIN.) =    9.67
  TOTAL AREA(ACRES) =        9.7
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5012.00 =    1673.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5012.00 TO NODE   5017.00 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) =   674.00
  FLOW LENGTH(FEET) =   281.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.69
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.72
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   10.07
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5017.00 =    1954.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5017.00 TO NODE   5017.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5020.00 TO NODE   5021.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
  UPSTREAM ELEVATION(FEET) =    700.00
  DOWNSTREAM ELEVATION(FEET) =    695.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.375
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    98.18
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.533
  SUBAREA RUNOFF(CFS) =      1.15
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      1.15

****************************************************************************
  FLOW PROCESS FROM NODE   5021.00 TO NODE   5022.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  693.00  DOWNSTREAM ELEVATION(FEET) =  682.00
  STREET LENGTH(FEET) =   725.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.13
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
  STREET FLOW TRAVEL TIME(MIN.) =   3.91   Tc(MIN.) =   10.29
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.798
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
```

```
  SUBAREA AREA(ACRES) =    2.92      SUBAREA RUNOFF(CFS) =    9.95
  TOTAL AREA(ACRES) =        3.3        PEAK FLOW RATE(CFS) =      10.80

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.92
  FLOW VELOCITY(FEET/SEC.) =  3.51   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
  LONGEST FLOWPATH FROM NODE   5020.00 TO NODE   5022.00 =     842.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5022.00 TO NODE   5023.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   684.00  DOWNSTREAM(FEET) =   678.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.53
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.80
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   10.60
  LONGEST FLOWPATH FROM NODE   5020.00 TO NODE   5023.00 =    1042.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5023.00 TO NODE   5023.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.60
  RAINFALL INTENSITY(INCH/HR) =   4.71
  TOTAL STREAM AREA(ACRES) =     3.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.80

****************************************************************************
  FLOW PROCESS FROM NODE   5025.00 TO NODE   5026.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    691.00
  DOWNSTREAM ELEVATION(FEET) =    690.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.586
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.53
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.113
  SUBAREA RUNOFF(CFS) =      1.46
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.46

****************************************************************************
  FLOW PROCESS FROM NODE   5026.00 TO NODE   5023.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  690.00  DOWNSTREAM ELEVATION(FEET) =  678.00
  STREET LENGTH(FEET) =   320.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.35
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.93
  STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =    6.95
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.177
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    0.86      SUBAREA RUNOFF(CFS) =    3.77
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       5.04

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   6.98
  FLOW VELOCITY(FEET/SEC.) =  4.16   DEPTH*VELOCITY(FT*FT/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE   5025.00 TO NODE   5023.00 =     415.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5023.00 TO NODE   5023.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.95
  RAINFALL INTENSITY(INCH/HR) =   6.18
  TOTAL STREAM AREA(ACRES) =     1.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.04

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.80    10.60        4.705          3.26
      2        5.04     6.95        6.177          1.15

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.12     6.95       6.177
      2       14.64    10.60       4.705

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      14.64   Tc(MIN.) =   10.60
  TOTAL AREA(ACRES) =        4.4
  LONGEST FLOWPATH FROM NODE   5020.00 TO NODE   5023.00 =    1042.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5023.00 TO NODE   5017.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   679.00  DOWNSTREAM(FEET) =   674.00
  FLOW LENGTH(FEET) =   386.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.18
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.64
  PIPE TRAVEL TIME(MIN.) =   0.79    Tc(MIN.) =   11.39
```

```
  LONGEST FLOWPATH FROM NODE   5020.00 TO NODE   5017.00 =    1428.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5017.00 TO NODE   5017.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.39
  RAINFALL INTENSITY(INCH/HR) =   4.49
  TOTAL STREAM AREA(ACRES) =     4.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.64

****************************************************************************
  FLOW PROCESS FROM NODE   5030.00 TO NODE   5031.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    682.00
  DOWNSTREAM ELEVATION(FEET) =    681.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.65
  TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      1.65

****************************************************************************
  FLOW PROCESS FROM NODE   5031.00 TO NODE   5017.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  679.00  DOWNSTREAM ELEVATION(FEET) =  674.00
  STREET LENGTH(FEET) =   480.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.51
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.69
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =    8.23
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.543
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    3.45      SUBAREA RUNOFF(CFS) =   13.58
  TOTAL AREA(ACRES) =        3.8        PEAK FLOW RATE(CFS) =      14.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.62
```

```
  FLOW VELOCITY(FEET/SEC.) =  3.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.38
  LONGEST FLOWPATH FROM NODE   5030.00 TO NODE   5017.00 =     565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5029.00 TO NODE   5017.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.543
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6375
  SUBAREA AREA(ACRES) =    0.95   SUBAREA RUNOFF(CFS) =    1.84
  TOTAL AREA(ACRES) =        4.7   TOTAL RUNOFF(CFS) =      16.68
  TC(MIN.) =    8.23

****************************************************************************
  FLOW PROCESS FROM NODE   5017.00 TO NODE   5017.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.23
  RAINFALL INTENSITY(INCH/HR) =   5.54
  TOTAL STREAM AREA(ACRES) =     4.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.68

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.64    11.39        4.493          4.41
      2       16.68     8.23        5.543          4.72

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       28.54     8.23       5.543
      2       28.16    11.39       4.493

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      28.54   Tc(MIN.) =    8.23
  TOTAL AREA(ACRES) =        9.1
  LONGEST FLOWPATH FROM NODE   5020.00 TO NODE   5017.00 =    1428.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5017.00 TO NODE   5017.00 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       28.54     8.23       5.543         9.13
  LONGEST FLOWPATH FROM NODE   5020.00 TO NODE   5017.00 =    1428.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       31.72    10.07       4.863         9.68
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5017.00 =    1954.00 FEET.

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

```
      1      54.44       8.23        5.543
      2      56.76      10.07        4.863

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      56.76   Tc(MIN.) =   10.07
  TOTAL AREA(ACRES) =       18.8

****************************************************************************
  FLOW PROCESS FROM NODE   5017.00 TO NODE   5017.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5017.00 TO NODE   5032.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   674.00  DOWNSTREAM(FEET) =   672.00
  FLOW LENGTH(FEET) =   233.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.69
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      56.76
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   10.47
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5032.00 =    2187.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5032.00 TO NODE   5032.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5035.00 TO NODE   5036.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    688.00
  DOWNSTREAM ELEVATION(FEET) =    687.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE   5036.00 TO NODE   5037.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  686.00  DOWNSTREAM ELEVATION(FEET) =  680.00
  STREET LENGTH(FEET) =   133.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.73
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.24
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
  STREET FLOW TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =    5.96
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.825
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    0.84      SUBAREA RUNOFF(CFS) =    4.07
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       5.67

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   6.98
  FLOW VELOCITY(FEET/SEC.) =  4.68   DEPTH*VELOCITY(FT*FT/SEC.) =   1.24
  LONGEST FLOWPATH FROM NODE   5035.00 TO NODE   5037.00 =     218.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5037.00 TO NODE   5032.00 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) =   672.00
  FLOW LENGTH(FEET) =   303.00   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.) =   8.52
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.67
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    6.55
  LONGEST FLOWPATH FROM NODE   5035.00 TO NODE   5032.00 =     521.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5032.00 TO NODE   5032.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.55
  RAINFALL INTENSITY(INCH/HR) =   6.42
  TOTAL STREAM AREA(ACRES) =     1.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.67

****************************************************************************
  FLOW PROCESS FROM NODE   5040.00 TO NODE   5041.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    678.00
  DOWNSTREAM ELEVATION(FEET) =    677.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.13
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.13
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   5041.00 TO NODE   5032.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  677.00  DOWNSTREAM ELEVATION(FEET) =  671.00
  STREET LENGTH(FEET) =   225.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.76
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.34
  STREET FLOW TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =    6.33
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.561
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    1.43      SUBAREA RUNOFF(CFS) =    6.66
  TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =       7.69

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.28
  FLOW VELOCITY(FEET/SEC.) =  4.73   DEPTH*VELOCITY(FT*FT/SEC.) =   1.76
  LONGEST FLOWPATH FROM NODE   5040.00 TO NODE   5032.00 =     310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5032.00 TO NODE   5032.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.33
  RAINFALL INTENSITY(INCH/HR) =   6.56
  TOTAL STREAM AREA(ACRES) =     1.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.69

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.67     6.55        6.420          1.17
      2        7.69     6.33        6.561          1.65

  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       13.17     6.33       6.561
      2       13.19     6.55       6.420

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.19   Tc(MIN.) =    6.55
  TOTAL AREA(ACRES) =        2.8
```

```
  LONGEST FLOWPATH FROM NODE   5035.00 TO NODE   5032.00 =     521.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5032.00 TO NODE   5032.00 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       13.19     6.55       6.420        2.82
  LONGEST FLOWPATH FROM NODE   5035.00 TO NODE   5032.00 =     521.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       56.76    10.47       4.743       18.81
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5032.00 =    2187.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      48.68       6.55        6.420
      2      66.51      10.47        4.743

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      66.51   Tc(MIN.) =   10.47
  TOTAL AREA(ACRES) =       21.6

****************************************************************************
  FLOW PROCESS FROM NODE   5032.00 TO NODE   5032.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5032.00 TO NODE   5042.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   672.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.22
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.51
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   10.85
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5042.00 =    2417.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5042.00 TO NODE   5042.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.85
  RAINFALL INTENSITY(INCH/HR) =   4.64
  TOTAL STREAM AREA(ACRES) =    21.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     66.51

****************************************************************************
  FLOW PROCESS FROM NODE   5046.00 TO NODE   5047.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    688.00
  DOWNSTREAM ELEVATION(FEET) =    687.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.75
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      1.75

****************************************************************************
  FLOW PROCESS FROM NODE   5047.00 TO NODE   5042.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  687.00  DOWNSTREAM ELEVATION(FEET) =  670.00
  STREET LENGTH(FEET) =   698.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.49
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.35
  STREET FLOW TRAVEL TIME(MIN.) =   2.85   Tc(MIN.) =    8.29
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.516
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    3.91      SUBAREA RUNOFF(CFS) =   15.31
  TOTAL AREA(ACRES) =        4.2        PEAK FLOW RATE(CFS) =      16.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.92
  FLOW VELOCITY(FEET/SEC.) =  4.66   DEPTH*VELOCITY(FT*FT/SEC.) =   1.79
  LONGEST FLOWPATH FROM NODE   5046.00 TO NODE   5042.00 =     783.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5042.00 TO NODE   5042.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.29
  RAINFALL INTENSITY(INCH/HR) =   5.52
  TOTAL STREAM AREA(ACRES) =     4.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.64

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       66.51    10.85        4.636        21.63
      2       16.64     8.29        5.516          4.25
```

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       67.45     8.29       5.516
      2       80.50    10.85       4.636

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      80.50   Tc(MIN.) =   10.85
  TOTAL AREA(ACRES) =       25.9
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5042.00 =    2417.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5042.00 TO NODE   5048.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   671.00  DOWNSTREAM(FEET) =   666.00
  FLOW LENGTH(FEET) =   353.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.94
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      80.50
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   11.30
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5048.00 =    2770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5048.00 TO NODE   5048.00 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.) =   11.30
  RAINFALL INTENSITY(INCH/HR) =   4.51
  TOTAL STREAM AREA(ACRES) =    25.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     80.50

****************************************************************************
  FLOW PROCESS FROM NODE   5052.00 TO NODE   5053.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    683.00
  DOWNSTREAM ELEVATION(FEET) =    682.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.660
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.054
  SUBAREA RUNOFF(CFS) =      3.16
  TOTAL AREA(ACRES) =      0.63   TOTAL RUNOFF(CFS) =      3.16

****************************************************************************
  FLOW PROCESS FROM NODE   5053.00 TO NODE   5048.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  678.00  DOWNSTREAM ELEVATION(FEET) =  666.00
  STREET LENGTH(FEET) =   618.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.20
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.19
  STREET FLOW TRAVEL TIME(MIN.) =   2.83   Tc(MIN.) =    8.49
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.429
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    2.60      SUBAREA RUNOFF(CFS) =   10.02
  TOTAL AREA(ACRES) =        3.2        PEAK FLOW RATE(CFS) =      12.45

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  11.98
  FLOW VELOCITY(FEET/SEC.) =  4.01   DEPTH*VELOCITY(FT*FT/SEC.) =   1.47
  LONGEST FLOWPATH FROM NODE   5052.00 TO NODE   5048.00 =     718.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5048.00 TO NODE   5048.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.49
  RAINFALL INTENSITY(INCH/HR) =   5.43
  TOTAL STREAM AREA(ACRES) =     3.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.45

****************************************************************************
  FLOW PROCESS FROM NODE   5057.00 TO NODE   5058.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    685.00
  DOWNSTREAM ELEVATION(FEET) =    684.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.660
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.054
  SUBAREA RUNOFF(CFS) =      0.90
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.90

****************************************************************************
  FLOW PROCESS FROM NODE   5058.00 TO NODE   5048.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  684.00  DOWNSTREAM ELEVATION(FEET) =  666.00
  STREET LENGTH(FEET) =   834.00   CURB HEIGHT(INCHES) =  6.0
```

```
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.03
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.79
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.02
  STREET FLOW TRAVEL TIME(MIN.) =   2.91   Tc(MIN.) =    8.57
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.399
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    5.28      SUBAREA RUNOFF(CFS) =   20.24
  TOTAL AREA(ACRES) =        5.5        PEAK FLOW RATE(CFS) =      20.93

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  4.81   DEPTH*VELOCITY(FT*FT/SEC.) =   2.05
  LONGEST FLOWPATH FROM NODE   5057.00 TO NODE   5048.00 =     934.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5048.00 TO NODE   5048.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.57
  RAINFALL INTENSITY(INCH/HR) =   5.40
  TOTAL STREAM AREA(ACRES) =     5.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.93

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       80.50    11.30        4.515         25.88
      2       12.45     8.49        5.429          3.23
      3       20.93     8.57        5.399          5.46

  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      100.15     8.49       5.429
      2      100.63     8.57       5.399
      3      108.36    11.30       4.515

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     108.36   Tc(MIN.) =   11.30
  TOTAL AREA(ACRES) =       34.6
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5048.00 =    2770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5048.00 TO NODE   5059.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   666.00  DOWNSTREAM(FEET) =   665.00
  FLOW LENGTH(FEET) =    43.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.70
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     108.36
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   11.35
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5059.00 =    2813.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5059.00 TO NODE   5059.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5070.00 TO NODE   5071.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    745.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.210
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
  FLOW PROCESS FROM NODE   5071.00 TO NODE   5072.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    745.00  DOWNSTREAM(FEET) =    694.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   822.00   CHANNEL SLOPE =  0.0620
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.165
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.01
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =    9.18
  SUBAREA AREA(ACRES) =     1.28       SUBAREA RUNOFF(CFS) =    2.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.6         PEAK FLOW RATE(CFS) =       2.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   6.84
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5072.00 =     907.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5072.00 TO NODE   5090.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   694.00  DOWNSTREAM(FEET) =   692.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       2.87
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =    9.76
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5090.00 =    1087.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5090.00 TO NODE   5090.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.76
  RAINFALL INTENSITY(INCH/HR) =   4.96
  TOTAL STREAM AREA(ACRES) =     1.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.87

****************************************************************************
  FLOW PROCESS FROM NODE   5094.00 TO NODE   5095.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    749.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.900
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    72.65
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.622
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE   5095.00 TO NODE   5090.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  749.00  DOWNSTREAM ELEVATION(FEET) =  693.00
  STREET LENGTH(FEET) =   782.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.08
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
  STREET FLOW TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =   13.55
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.017
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.766
  SUBAREA AREA(ACRES) =    0.64      SUBAREA RUNOFF(CFS) =    2.24
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       2.46
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.77
  FLOW VELOCITY(FEET/SEC.) =  5.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
  LONGEST FLOWPATH FROM NODE   5094.00 TO NODE   5090.00 =     867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5076.00 TO NODE   5090.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.017
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6656
  SUBAREA AREA(ACRES) =    2.26   SUBAREA RUNOFF(CFS) =    5.72
  TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       8.18
  TC(MIN.) =   13.55

****************************************************************************
  FLOW PROCESS FROM NODE   5090.00 TO NODE   5090.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.55
  RAINFALL INTENSITY(INCH/HR) =   4.02
  TOTAL STREAM AREA(ACRES) =     3.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.87     9.76        4.964          1.59
      2        8.18    13.55        4.017          3.06

  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        8.77     9.76       4.964
      2       10.51    13.55       4.017

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.51   Tc(MIN.) =   13.55
  TOTAL AREA(ACRES) =        4.6
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5090.00 =    1087.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5090.00 TO NODE   5096.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.00  DOWNSTREAM(FEET) =   688.00
  FLOW LENGTH(FEET) =    68.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.62
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.51
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   13.63
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5096.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5096.00 TO NODE   5096.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.63
  RAINFALL INTENSITY(INCH/HR) =   4.00
  TOTAL STREAM AREA(ACRES) =     4.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.51

****************************************************************************
  FLOW PROCESS FROM NODE   5100.00 TO NODE   5101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    752.00
  DOWNSTREAM ELEVATION(FEET) =    750.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.870
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.60
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.60

****************************************************************************
  FLOW PROCESS FROM NODE   5101.00 TO NODE   5096.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  750.00  DOWNSTREAM ELEVATION(FEET) =  690.00
  STREET LENGTH(FEET) =   739.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.38
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    3.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.25
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
  STREET FLOW TRAVEL TIME(MIN.) =   2.35   Tc(MIN.) =    5.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.436
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    0.24      SUBAREA RUNOFF(CFS) =    1.55
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       2.13

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   5.11
  FLOW VELOCITY(FEET/SEC.) =  5.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  LONGEST FLOWPATH FROM NODE   5100.00 TO NODE   5096.00 =     824.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5081.00 TO NODE   5096.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.436
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4309
 SUBAREA AREA(ACRES) =    1.79   SUBAREA RUNOFF(CFS) =    4.66
 TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       6.79
 TC(MIN.) =    5.21

****************************************************************************
 FLOW PROCESS FROM NODE   5096.00 TO NODE   5096.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.21
 RAINFALL INTENSITY(INCH/HR) =   7.44
 TOTAL STREAM AREA(ACRES) =     2.12
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.79

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       10.51    13.63        4.002          4.65
     2        6.79     5.21        7.436          2.12

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       12.45     5.21       7.436
     2       14.16    13.63       4.002

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      14.16   Tc(MIN.) =   13.63
 TOTAL AREA(ACRES) =        6.8
 LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5096.00 =    1155.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   5096.00 TO NODE   5102.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   688.00  DOWNSTREAM(FEET) =   681.00
 FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.17
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      14.16
 PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =   14.35
 LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5102.00 =    1555.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   5102.00 TO NODE   5102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.35
 RAINFALL INTENSITY(INCH/HR) =   3.87
 TOTAL STREAM AREA(ACRES) =     6.77
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.16

****************************************************************************
 FLOW PROCESS FROM NODE   5105.00 TO NODE   5106.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    702.00
  DOWNSTREAM ELEVATION(FEET) =    696.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.427
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    96.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.56
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      1.56

****************************************************************************
  FLOW PROCESS FROM NODE   5106.00 TO NODE   5102.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  696.00  DOWNSTREAM ELEVATION(FEET) =  680.00
  STREET LENGTH(FEET) =  1044.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.38
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.87
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  STREET FLOW TRAVEL TIME(MIN.) =   5.16   Tc(MIN.) =    7.58
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.840
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  SUBAREA AREA(ACRES) =    1.12      SUBAREA RUNOFF(CFS) =    5.56
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       6.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.04
  FLOW VELOCITY(FEET/SEC.) =  3.71   DEPTH*VELOCITY(FT*FT/SEC.) =   1.44
  LONGEST FLOWPATH FROM NODE   5105.00 TO NODE   5102.00 =    1144.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5106.00 TO NODE   5102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.840
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4257
  SUBAREA AREA(ACRES) =    7.62   SUBAREA RUNOFF(CFS) =   15.57
  TOTAL AREA(ACRES) =        9.0   TOTAL RUNOFF(CFS) =      22.33
```

```
  TC(MIN.) =    7.58

****************************************************************************
  FLOW PROCESS FROM NODE   5102.00 TO NODE   5102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.58
  RAINFALL INTENSITY(INCH/HR) =   5.84
  TOTAL STREAM AREA(ACRES) =     8.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.16    14.35        3.870          6.77
      2       22.33     7.58        5.840          8.98

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       31.71     7.58       5.840
      2       28.96    14.35       3.870

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.71   Tc(MIN.) =    7.58
  TOTAL AREA(ACRES) =       15.7
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5102.00 =    1555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5102.00 TO NODE   5059.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   681.00  DOWNSTREAM(FEET) =   665.00
  FLOW LENGTH(FEET) =   951.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.96
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.71
  PIPE TRAVEL TIME(MIN.) =   1.45    Tc(MIN.) =    9.03
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5059.00 =    2506.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5059.00 TO NODE   5059.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       31.71     9.03       5.218       15.75
  LONGEST FLOWPATH FROM NODE   5070.00 TO NODE   5059.00 =    2506.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      108.36    11.35       4.504       34.57
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5059.00 =    2813.00 FEET.

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

```
      1     117.95       9.03        5.218
      2     135.73      11.35        4.504

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     135.73   Tc(MIN.) =   11.35
  TOTAL AREA(ACRES) =       50.3

****************************************************************************
  FLOW PROCESS FROM NODE   5059.00 TO NODE   5059.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5059.00 TO NODE   5120.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   666.00  DOWNSTREAM(FEET) =   633.00
  FLOW LENGTH(FEET) =   452.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.72
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     135.73
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   11.63
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5120.00 =    3265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5059.00 TO NODE   5120.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.433
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6008
  SUBAREA AREA(ACRES) =    1.75   SUBAREA RUNOFF(CFS) =    2.72
  TOTAL AREA(ACRES) =       52.1   TOTAL RUNOFF(CFS) =     138.68
  TC(MIN.) =   11.63

****************************************************************************
  FLOW PROCESS FROM NODE   5120.00 TO NODE   5120.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5097.00 TO NODE   5098.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    700.00
  DOWNSTREAM ELEVATION(FEET) =    695.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.691
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE   5098.00 TO NODE   5099.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
```

```
  UPSTREAM ELEVATION(FEET) =  690.00  DOWNSTREAM ELEVATION(FEET) =  670.00
  STREET LENGTH(FEET) =  1037.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   12.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.01
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.47
  STREET FLOW TRAVEL TIME(MIN.) =   4.31   Tc(MIN.) =   12.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.296
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.700
  SUBAREA AREA(ACRES) =    8.11      SUBAREA RUNOFF(CFS) =   24.74
  TOTAL AREA(ACRES) =        8.3        PEAK FLOW RATE(CFS) =      25.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  4.83   DEPTH*VELOCITY(FT*FT/SEC.) =   2.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1037.0 FT WITH ELEVATION-DROP =  20.0 FT, IS   44.0 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   5099.00
  LONGEST FLOWPATH FROM NODE   5097.00 TO NODE   5099.00 =    1137.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5099.00 TO NODE   5120.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   668.00  DOWNSTREAM(FEET) =   640.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.67
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.10
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   12.25
  LONGEST FLOWPATH FROM NODE   5097.00 TO NODE   5120.00 =    1217.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5120.00 TO NODE   5120.00 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       25.10    12.25       4.287        8.35
  LONGEST FLOWPATH FROM NODE   5097.00 TO NODE   5120.00 =    1217.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      138.68    11.63       4.433       52.07
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5120.00 =    3265.00 FEET.

  ** PEAK FLOW RATE TABLE **
```

```
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     162.50      11.63        4.433
      2     159.21      12.25        4.287

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     162.50   Tc(MIN.) =   11.63
  TOTAL AREA(ACRES) =       60.4

****************************************************************************
  FLOW PROCESS FROM NODE   5120.00 TO NODE   5120.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   5120.00 TO NODE   5120.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  23.63   RAIN INTENSITY(INCH/HOUR) =  2.81
  TOTAL AREA(ACRES) =    60.40   TOTAL RUNOFF(CFS) =     78.46

****************************************************************************
  FLOW PROCESS FROM NODE   5120.00 TO NODE   5130.00 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) =   625.00
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.57
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      78.46
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   23.68
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5130.00 =    3349.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   5130.00 TO NODE   5130.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       78.46    23.68       2.802       60.40
  LONGEST FLOWPATH FROM NODE   5000.00 TO NODE   5130.00 =    3349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      281.08    18.48       3.288       97.14
  LONGEST FLOWPATH FROM NODE   3010.00 TO NODE   5130.00 =    5532.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     342.32      18.48        3.288
      2     318.03      23.68        2.802

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     342.32   Tc(MIN.) =   18.48
  TOTAL AREA(ACRES) =      157.5

****************************************************************************
  FLOW PROCESS FROM NODE   5130.00 TO NODE   5130.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
```

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

******************************************************************************
  FLOW PROCESS FROM NODE   4000.00 TO NODE   4001.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    705.00
  DOWNSTREAM ELEVATION(FEET) =    704.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.184
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    62.65
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.09
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      1.09

******************************************************************************
  FLOW PROCESS FROM NODE   4001.00 TO NODE   4002.00 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) =  704.00  DOWNSTREAM ELEVATION(FEET) =  691.00
  STREET LENGTH(FEET) =   528.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.09
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.40
  STREET FLOW TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =    6.30
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.584
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
  SUBAREA AREA(ACRES) =    3.44      SUBAREA RUNOFF(CFS) =   17.89
  TOTAL AREA(ACRES) =        3.6        PEAK FLOW RATE(CFS) =      18.83

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.56
  FLOW VELOCITY(FEET/SEC.) =  4.81   DEPTH*VELOCITY(FT*FT/SEC.) =   1.91
  LONGEST FLOWPATH FROM NODE   4000.00 TO NODE   4002.00 =     613.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   4002.00 TO NODE   4003.00 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) =   670.00
  FLOW LENGTH(FEET) =   640.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.24
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.83
  PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =    7.17
  LONGEST FLOWPATH FROM NODE   4000.00 TO NODE   4003.00 =    1253.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4003.00 TO NODE   4003.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.17
  RAINFALL INTENSITY(INCH/HR) =   6.06
  TOTAL STREAM AREA(ACRES) =     3.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.83

****************************************************************************
  FLOW PROCESS FROM NODE   4018.00 TO NODE   4019.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    700.00
  DOWNSTREAM ELEVATION(FEET) =    699.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.184
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    62.65
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.09
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      1.09

****************************************************************************
  FLOW PROCESS FROM NODE   4019.00 TO NODE   4003.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  700.00  DOWNSTREAM ELEVATION(FEET) =  676.00
  STREET LENGTH(FEET) =   702.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   12.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.99
  STREET FLOW TRAVEL TIME(MIN.) =   2.19   Tc(MIN.) =    6.37
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.534
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
  SUBAREA AREA(ACRES) =    6.26      SUBAREA RUNOFF(CFS) =   32.31
  TOTAL AREA(ACRES) =        6.4        PEAK FLOW RATE(CFS) =      33.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  6.40   DEPTH*VELOCITY(FT*FT/SEC.) =   2.83
  LONGEST FLOWPATH FROM NODE   4018.00 TO NODE   4003.00 =     787.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4003.00 TO NODE   4003.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.37
  RAINFALL INTENSITY(INCH/HR) =   6.53
  TOTAL STREAM AREA(ACRES) =     6.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.24

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       18.83     7.17        6.056          3.62
      2       33.24     6.37        6.534          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       49.98     6.37       6.534
      2       49.64     7.17       6.056

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.98   Tc(MIN.) =    6.37
  TOTAL AREA(ACRES) =       10.1
  LONGEST FLOWPATH FROM NODE   4000.00 TO NODE   4003.00 =    1253.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4003.00 TO NODE   4020.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   676.00  DOWNSTREAM(FEET) =   640.00
  FLOW LENGTH(FEET) =   405.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.02
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.98
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    6.67
  LONGEST FLOWPATH FROM NODE   4000.00 TO NODE   4020.00 =    1658.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4003.00 TO NODE   4020.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.347
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7565
  SUBAREA AREA(ACRES) =    0.83   SUBAREA RUNOFF(CFS) =    1.84
  TOTAL AREA(ACRES) =       10.9   TOTAL RUNOFF(CFS) =      52.29
  TC(MIN.) =    6.67
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   4020.00 TO NODE   4020.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  13.67   RAIN INTENSITY(INCH/HOUR) =  3.99
  TOTAL AREA(ACRES) =    10.90   TOTAL RUNOFF(CFS) =     17.95

****************************************************************************
  FLOW PROCESS FROM NODE   4020.00 TO NODE   4030.00 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) =   630.00
  FLOW LENGTH(FEET) =   405.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.04
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.95
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =   14.28
  LONGEST FLOWPATH FROM NODE   4000.00 TO NODE   4030.00 =    2063.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4030.00 TO NODE   4030.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.28
  RAINFALL INTENSITY(INCH/HR) =   3.88
  TOTAL STREAM AREA(ACRES) =    10.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.95

****************************************************************************
  FLOW PROCESS FROM NODE   4040.00 TO NODE   4041.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.00
  UPSTREAM ELEVATION(FEET) =    690.00
  DOWNSTREAM ELEVATION(FEET) =    685.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.978
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    83.20
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.893
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE   4041.00 TO NODE   4030.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    675.00  DOWNSTREAM(FEET) =    631.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.00   CHANNEL SLOPE =  0.0756
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.301
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.39
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =   12.19
  SUBAREA AREA(ACRES) =     0.59       SUBAREA RUNOFF(CFS) =    0.89
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   5.03
  LONGEST FLOWPATH FROM NODE   4040.00 TO NODE   4030.00 =     848.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   4042.00 TO NODE   4030.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.301
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    0.56   SUBAREA RUNOFF(CFS) =    0.84
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       1.88
  TC(MIN.) =   12.19

****************************************************************************
  FLOW PROCESS FROM NODE   4030.00 TO NODE   4030.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR 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) =   4.30
  TOTAL STREAM AREA(ACRES) =     1.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.88

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       17.95    14.28        3.883         10.90
      2        1.88    12.19        4.301          1.25

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       17.20    12.19       4.301
      2       19.65    14.28       3.883

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.65   Tc(MIN.) =   14.28
  TOTAL AREA(ACRES) =       12.1
  LONGEST FLOWPATH FROM NODE   4000.00 TO NODE   4030.00 =    2063.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   7000.00 TO NODE   7001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    680.00
  DOWNSTREAM ELEVATION(FEET) =    679.00
  ELEVATION DIFFERENCE(FEET) =      1.00
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.322
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    60.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.33
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.33

****************************************************************************
  FLOW PROCESS FROM NODE   7001.00 TO NODE   7002.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  681.00  DOWNSTREAM ELEVATION(FEET) =  655.00
  STREET LENGTH(FEET) =   211.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.18
    HALFSTREET FLOOD WIDTH(FEET) =    2.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.17
  STREET FLOW TRAVEL TIME(MIN.) =   0.53   Tc(MIN.) =    4.85
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.739
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    2.12
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       3.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   3.80
  FLOW VELOCITY(FEET/SEC.) =  6.56   DEPTH*VELOCITY(FT*FT/SEC.) =   1.33
  LONGEST FLOWPATH FROM NODE   7000.00 TO NODE   7002.00 =     311.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   7002.00 TO NODE   7010.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   655.00  DOWNSTREAM(FEET) =   652.00
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.66
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.44
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    4.90
  LONGEST FLOWPATH FROM NODE   7000.00 TO NODE   7010.00 =     343.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   7002.00 TO NODE   7010.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6136
 SUBAREA AREA(ACRES) =    0.29   SUBAREA RUNOFF(CFS) =    0.78
 TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       4.22
 TC(MIN.) =    4.90

****************************************************************************
 FLOW PROCESS FROM NODE   7010.00 TO NODE   7010.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    4.90
 RAINFALL INTENSITY(INCH/HR) =   7.64
 TOTAL STREAM AREA(ACRES) =     0.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.22

****************************************************************************
 FLOW PROCESS FROM NODE   7020.00 TO NODE   7021.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
 UPSTREAM ELEVATION(FEET) =    678.00
 DOWNSTREAM ELEVATION(FEET) =    676.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.358
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.100
 SUBAREA RUNOFF(CFS) =      0.20
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
 FLOW PROCESS FROM NODE   7021.00 TO NODE   7010.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    675.00  DOWNSTREAM(FEET) =    652.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1821.00   CHANNEL SLOPE =  0.0126
 CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.079
 *USER SPECIFIED(SUBAREA):
 NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.87
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.73
 AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =  11.11
 Tc(MIN.) =   20.47
 SUBAREA AREA(ACRES) =     1.20       SUBAREA RUNOFF(CFS) =    1.29
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        1.3         PEAK FLOW RATE(CFS) =       1.41

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   3.20
 LONGEST FLOWPATH FROM NODE   7020.00 TO NODE   7010.00 =    1906.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   7025.00 TO NODE   7010.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.079
```

```
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    1.40   SUBAREA RUNOFF(CFS) =    1.51
  TOTAL AREA(ACRES) =        2.7   TOTAL RUNOFF(CFS) =       2.92
  TC(MIN.) =   20.47

****************************************************************************
  FLOW PROCESS FROM NODE   7026.00 TO NODE   7010.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.079
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    0.85   SUBAREA RUNOFF(CFS) =    0.92
  TOTAL AREA(ACRES) =        3.6   TOTAL RUNOFF(CFS) =       3.84
  TC(MIN.) =   20.47

****************************************************************************
  FLOW PROCESS FROM NODE   7010.00 TO NODE   7010.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.47
  RAINFALL INTENSITY(INCH/HR) =   3.08
  TOTAL STREAM AREA(ACRES) =     3.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.84

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.22     4.90        7.641          0.90
      2        3.84    20.47        3.079          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        5.14     4.90       7.641
      2        5.54    20.47       3.079

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.54   Tc(MIN.) =   20.47
  TOTAL AREA(ACRES) =        4.5
  LONGEST FLOWPATH FROM NODE   7020.00 TO NODE   7010.00 =    1906.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8010.00 TO NODE   8011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    683.00
  DOWNSTREAM ELEVATION(FEET) =    682.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
 SUBAREA RUNOFF(CFS) =      1.49
 TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.49

****************************************************************************
 FLOW PROCESS FROM NODE   8011.00 TO NODE   8012.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  682.00  DOWNSTREAM ELEVATION(FEET) =  672.00
 STREET LENGTH(FEET) =   622.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
 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) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.13
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.35
   HALFSTREET FLOOD WIDTH(FEET) =   10.99
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.19
 STREET FLOW TRAVEL TIME(MIN.) =   3.01   Tc(MIN.) =    8.44
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.450
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
 SUBAREA AREA(ACRES) =    3.90      SUBAREA RUNOFF(CFS) =   15.09
 TOTAL AREA(ACRES) =        4.2        PEAK FLOW RATE(CFS) =      16.21

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.92
 FLOW VELOCITY(FEET/SEC.) =  3.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
 LONGEST FLOWPATH FROM NODE   8010.00 TO NODE   8012.00 =     707.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   8012.00 TO NODE   8013.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   672.00  DOWNSTREAM(FEET) =   670.00
 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.) =   7.52
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      16.21
 PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    8.91
 LONGEST FLOWPATH FROM NODE   8010.00 TO NODE   8013.00 =     917.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   8013.00 TO NODE   8013.00 IS 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) =   5.26
 TOTAL STREAM AREA(ACRES) =     4.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.21
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   8033.00 TO NODE   8034.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    679.00
  DOWNSTREAM ELEVATION(FEET) =    678.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.13
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.13

****************************************************************************
  FLOW PROCESS FROM NODE   8034.00 TO NODE   8013.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  678.00  DOWNSTREAM ELEVATION(FEET) =  671.00
  STREET LENGTH(FEET) =   296.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.80
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.29
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.60
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
  STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =    6.80
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.263
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    2.09      SUBAREA RUNOFF(CFS) =    9.29
  TOTAL AREA(ACRES) =        2.3        PEAK FLOW RATE(CFS) =      10.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.63
  FLOW VELOCITY(FEET/SEC.) =  4.11   DEPTH*VELOCITY(FT*FT/SEC.) =   1.39
  LONGEST FLOWPATH FROM NODE   8033.00 TO NODE   8013.00 =     381.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8013.00 TO NODE   8013.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.80
  RAINFALL INTENSITY(INCH/HR) =   6.26
  TOTAL STREAM AREA(ACRES) =     2.31
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.27

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.21     8.91        5.265          4.19
      2       10.27     6.80        6.263          2.31

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       22.66     6.80       6.263
      2       24.85     8.91       5.265

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      24.85   Tc(MIN.) =    8.91
  TOTAL AREA(ACRES) =        6.5
  LONGEST FLOWPATH FROM NODE   8010.00 TO NODE   8013.00 =     917.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8013.00 TO NODE   8013.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8018.00 TO NODE   8019.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    687.00
  DOWNSTREAM ELEVATION(FEET) =    686.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.660
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.054
  SUBAREA RUNOFF(CFS) =      1.35
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      1.35

****************************************************************************
  FLOW PROCESS FROM NODE   8019.00 TO NODE   8020.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  686.00  DOWNSTREAM ELEVATION(FEET) =  675.00
  STREET LENGTH(FEET) =   660.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.21
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
```

```
    HALFSTREET FLOOD WIDTH(FEET) =   10.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  STREET FLOW TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =    8.86
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.284
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    1.51      SUBAREA RUNOFF(CFS) =    5.67
  TOTAL AREA(ACRES) =        1.8        PEAK FLOW RATE(CFS) =       6.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.74
  FLOW VELOCITY(FEET/SEC.) =  3.83   DEPTH*VELOCITY(FT*FT/SEC.) =   1.46
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8020.00 =     760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8020.00 TO NODE   8021.00 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) =   671.00
  FLOW LENGTH(FEET) =   266.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.21
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.68
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =    9.47
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8021.00 =    1026.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8021.00 TO NODE   8021.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.47
  RAINFALL INTENSITY(INCH/HR) =   5.06
  TOTAL STREAM AREA(ACRES) =     1.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.68

****************************************************************************
  FLOW PROCESS FROM NODE   8027.00 TO NODE   8028.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    681.00
  DOWNSTREAM ELEVATION(FEET) =    680.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      1.34
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      1.34

****************************************************************************
  FLOW PROCESS FROM NODE   8028.00 TO NODE   8021.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
```

```
==========================================================================
  UPSTREAM ELEVATION(FEET) =  680.00  DOWNSTREAM ELEVATION(FEET) =  671.00
  STREET LENGTH(FEET) =   594.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.42
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.98
  STREET FLOW TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =    8.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.374
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    2.63      SUBAREA RUNOFF(CFS) =   10.03
  TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =      11.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.04
  FLOW VELOCITY(FEET/SEC.) =  3.52   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  LONGEST FLOWPATH FROM NODE   8027.00 TO NODE   8021.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8021.00 TO NODE   8021.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.63
  RAINFALL INTENSITY(INCH/HR) =   5.37
  TOTAL STREAM AREA(ACRES) =     2.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.03

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.68     9.47        5.060          1.78
      2       11.03     8.63        5.374          2.89

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       17.11     8.63       5.374
      2       17.06     9.47       5.060

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.11   Tc(MIN.) =    8.63
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8021.00 =    1026.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8021.00 TO NODE   8013.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   671.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.27
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.11
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    8.80
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8013.00 =    1111.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8013.00 TO NODE   8013.00 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       17.11     8.80       5.306        4.67
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8013.00 =    1111.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       24.85     8.91       5.265        6.50
  LONGEST FLOWPATH FROM NODE   8010.00 TO NODE   8013.00 =     917.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      41.66       8.80        5.306
      2      41.82       8.91        5.265

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      41.82   Tc(MIN.) =    8.91
  TOTAL AREA(ACRES) =       11.2

****************************************************************************
  FLOW PROCESS FROM NODE   8013.00 TO NODE   8013.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8013.00 TO NODE   8035.00 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) =   668.00
  FLOW LENGTH(FEET) =   214.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.40
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.82
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    9.29
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8035.00 =    1325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8035.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.29
  RAINFALL INTENSITY(INCH/HR) =   5.12
  TOTAL STREAM AREA(ACRES) =    11.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.82
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   8060.00 TO NODE   8061.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =    680.00
  DOWNSTREAM ELEVATION(FEET) =    676.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.846
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    82.86
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.908
  SUBAREA RUNOFF(CFS) =      1.48
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      1.48

****************************************************************************
  FLOW PROCESS FROM NODE   8061.00 TO NODE   8035.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  679.00  DOWNSTREAM ELEVATION(FEET) =  668.00
  STREET LENGTH(FEET) =   576.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.87
  STREET FLOW TRAVEL TIME(MIN.) =   3.06   Tc(MIN.) =    8.91
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.263
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
  SUBAREA AREA(ACRES) =    1.75      SUBAREA RUNOFF(CFS) =    5.80
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       6.93

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.40
  FLOW VELOCITY(FEET/SEC.) =  3.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.09
  LONGEST FLOWPATH FROM NODE   8060.00 TO NODE   8035.00 =     751.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8035.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.91
  RAINFALL INTENSITY(INCH/HR) =   5.26
```

```
  TOTAL STREAM AREA(ACRES) =     2.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.93

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       41.82     9.29        5.125         11.17
      2        6.93     8.91        5.263          2.09

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       47.06     8.91       5.263
      2       48.57     9.29       5.125

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      48.57   Tc(MIN.) =    9.29
  TOTAL AREA(ACRES) =       13.3
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8035.00 =    1325.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8035.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8026.00 TO NODE   8027.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    678.00
  DOWNSTREAM ELEVATION(FEET) =    676.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.879
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    85.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.925
  SUBAREA RUNOFF(CFS) =      0.52
  TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
  FLOW PROCESS FROM NODE   8027.00 TO NODE   8045.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    678.00  DOWNSTREAM(FEET) =    662.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00   CHANNEL SLOPE =  0.0471
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.633
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.78
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =   10.86
  SUBAREA AREA(ACRES) =     2.10       SUBAREA RUNOFF(CFS) =    3.41
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       3.89
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   7.02
  LONGEST FLOWPATH FROM NODE   8026.00 TO NODE   8045.00 =     440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8045.00 TO NODE   8045.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.86
  RAINFALL INTENSITY(INCH/HR) =   4.63
  TOTAL STREAM AREA(ACRES) =     2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.89

****************************************************************************
  FLOW PROCESS FROM NODE   8042.00 TO NODE   8043.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    682.00
  DOWNSTREAM ELEVATION(FEET) =    680.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.879
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    85.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.925
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
  FLOW PROCESS FROM NODE   8043.00 TO NODE   8045.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  680.00  DOWNSTREAM ELEVATION(FEET) =  670.00
  STREET LENGTH(FEET) =   513.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.03
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.36
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.84
  STREET FLOW TRAVEL TIME(MIN.) =   2.78   Tc(MIN.) =   12.66
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.197
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.682
  SUBAREA AREA(ACRES) =    0.77      SUBAREA RUNOFF(CFS) =    2.75
  TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       3.32
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.17
  FLOW VELOCITY(FEET/SEC.) =  3.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.07
  LONGEST FLOWPATH FROM NODE   8042.00 TO NODE   8045.00 =     613.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8044.00 TO NODE   8045.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.197
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5751
  SUBAREA AREA(ACRES) =    0.55   SUBAREA RUNOFF(CFS) =    0.81
  TOTAL AREA(ACRES) =        1.7   TOTAL RUNOFF(CFS) =       4.13
  TC(MIN.) =   12.66

****************************************************************************
  FLOW PROCESS FROM NODE   8045.00 TO NODE   8045.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.66
  RAINFALL INTENSITY(INCH/HR) =   4.20
  TOTAL STREAM AREA(ACRES) =     1.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.13

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.89    10.86        4.633          2.40
      2        4.13    12.66        4.197          1.71

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.43    10.86       4.633
      2        7.65    12.66       4.197

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.65   Tc(MIN.) =   12.66
  TOTAL AREA(ACRES) =        4.1
  LONGEST FLOWPATH FROM NODE   8042.00 TO NODE   8045.00 =     613.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8045.00 TO NODE   8046.00 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) =   668.00
  FLOW LENGTH(FEET) =    42.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.46
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.65
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   12.72
  LONGEST FLOWPATH FROM NODE   8042.00 TO NODE   8046.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8046.00 TO NODE   8046.00 IS 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) =   4.18
  TOTAL STREAM AREA(ACRES) =     4.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.65

****************************************************************************
  FLOW PROCESS FROM NODE   8052.00 TO NODE   8053.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (10.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    682.00
  DOWNSTREAM ELEVATION(FEET) =    680.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.389
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.523
  SUBAREA RUNOFF(CFS) =      1.14
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.14

****************************************************************************
  FLOW PROCESS FROM NODE   8053.00 TO NODE   8046.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  680.00  DOWNSTREAM ELEVATION(FEET) =  668.00
  STREET LENGTH(FEET) =   487.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.57
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.99
  STREET FLOW TRAVEL TIME(MIN.) =   2.28   Tc(MIN.) =    8.67
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.359
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (10.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.600
  SUBAREA AREA(ACRES) =    0.83      SUBAREA RUNOFF(CFS) =    2.67
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =       3.60

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.05
  FLOW VELOCITY(FEET/SEC.) =  3.84   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
  LONGEST FLOWPATH FROM NODE   8052.00 TO NODE   8046.00 =     587.00 FEET.

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

```
  FLOW PROCESS FROM NODE   8046.00 TO NODE   8046.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.67
  RAINFALL INTENSITY(INCH/HR) =   5.36
  TOTAL STREAM AREA(ACRES) =     1.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.65    12.72        4.184          4.11
      2        3.60     8.67        5.359          1.12

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.58     8.67       5.359
      2       10.46    12.72       4.184

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.46   Tc(MIN.) =   12.72
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE   8042.00 TO NODE   8046.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8046.00 TO NODE   8035.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   668.00  DOWNSTREAM(FEET) =   667.00
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.46
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   12.95
  LONGEST FLOWPATH FROM NODE   8042.00 TO NODE   8035.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8035.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.46    12.95       4.135        5.23
  LONGEST FLOWPATH FROM NODE   8042.00 TO NODE   8035.00 =     750.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       48.57     9.29       5.125       13.26
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8035.00 =    1325.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      56.07       9.29        5.125
      2      49.65      12.95        4.135
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      56.07   Tc(MIN.) =    9.29
  TOTAL AREA(ACRES) =       18.5

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8035.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8150.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   667.00  DOWNSTREAM(FEET) =   657.00
  FLOW LENGTH(FEET) =   187.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.52
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      56.07
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    9.45
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8150.00 =    1512.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8035.00 TO NODE   8150.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.069
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6227
  SUBAREA AREA(ACRES) =    0.84   SUBAREA RUNOFF(CFS) =    1.49
  TOTAL AREA(ACRES) =       19.3   TOTAL RUNOFF(CFS) =      61.01
  TC(MIN.) =    9.45

****************************************************************************
  FLOW PROCESS FROM NODE   8150.00 TO NODE   8150.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8070.00 TO NODE   8071.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   203.00
  UPSTREAM ELEVATION(FEET) =    690.00
  DOWNSTREAM ELEVATION(FEET) =    685.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.586
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    91.95
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.021
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE   8071.00 TO NODE   8072.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    690.00  DOWNSTREAM(FEET) =    680.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1212.00   CHANNEL SLOPE =  0.0083
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.552
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.97
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   6.81
  Tc(MIN.) =   16.40
  SUBAREA AREA(ACRES) =     2.09       SUBAREA RUNOFF(CFS) =    2.60
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       2.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   3.48
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8072.00 =    1415.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8072.00 TO NODE   8073.00 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) =   679.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.13
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.82
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   16.45
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8073.00 =    1440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8073.00 TO NODE   8073.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.45
  RAINFALL INTENSITY(INCH/HR) =   3.54
  TOTAL STREAM AREA(ACRES) =     2.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.82

****************************************************************************
  FLOW PROCESS FROM NODE   8078.00 TO NODE   8079.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    679.00
  DOWNSTREAM ELEVATION(FEET) =    678.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.434
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.242
  SUBAREA RUNOFF(CFS) =      0.77
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.77

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

```
  FLOW PROCESS FROM NODE   8079.00 TO NODE   8073.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  677.00  DOWNSTREAM ELEVATION(FEET) =  676.00
  STREET LENGTH(FEET) =   100.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.88
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.49
  STREET FLOW TRAVEL TIME(MIN.) =   0.82   Tc(MIN.) =    6.25
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.614
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.710
  SUBAREA AREA(ACRES) =    0.47      SUBAREA RUNOFF(CFS) =    2.21
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.36
  FLOW VELOCITY(FEET/SEC.) =  2.21   DEPTH*VELOCITY(FT*FT/SEC.) =   0.60
  LONGEST FLOWPATH FROM NODE   8078.00 TO NODE   8073.00 =     185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8073.00 TO NODE   8073.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.25
  RAINFALL INTENSITY(INCH/HR) =   6.61
  TOTAL STREAM AREA(ACRES) =     0.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.82    16.45        3.545          2.27
      2        2.91     6.25        6.614          0.62

  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        3.98     6.25       6.614
      2        4.38    16.45       3.545

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.38   Tc(MIN.) =   16.45
  TOTAL AREA(ACRES) =        2.9
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8073.00 =    1440.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   8073.00 TO NODE   8080.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   677.00  DOWNSTREAM(FEET) =   675.00
  FLOW LENGTH(FEET) =   211.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.46
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.38
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   17.09
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8080.00 =    1651.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8080.00 TO NODE   8080.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8088.00 TO NODE   8089.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    687.00
  DOWNSTREAM ELEVATION(FEET) =    686.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.319
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.39
  TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      1.39

****************************************************************************
  FLOW PROCESS FROM NODE   8089.00 TO NODE   8085.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  686.00  DOWNSTREAM ELEVATION(FEET) =  680.00
  STREET LENGTH(FEET) =   364.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   12.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.37
  STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =    5.95
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.829
```

```
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
  SUBAREA AREA(ACRES) =    1.68      SUBAREA RUNOFF(CFS) =    9.06
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =      10.30

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.00
  FLOW VELOCITY(FEET/SEC.) =  4.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.79
  LONGEST FLOWPATH FROM NODE   8088.00 TO NODE   8085.00 =     449.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8085.00 TO NODE   8090.00 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) =   679.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.61
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.30
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    5.99
  LONGEST FLOWPATH FROM NODE   8088.00 TO NODE   8090.00 =     474.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8090.00 TO NODE   8090.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.99
  RAINFALL INTENSITY(INCH/HR) =   6.80
  TOTAL STREAM AREA(ACRES) =     1.91
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.30

****************************************************************************
  FLOW PROCESS FROM NODE   8093.00 TO NODE   8094.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    689.00
  DOWNSTREAM ELEVATION(FEET) =    687.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.836
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.15
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.15

****************************************************************************
  FLOW PROCESS FROM NODE   8094.00 TO NODE   8090.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  686.00  DOWNSTREAM ELEVATION(FEET) =  679.00
  STREET LENGTH(FEET) =   495.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.09
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.79
  STREET FLOW TRAVEL TIME(MIN.) =   2.99   Tc(MIN.) =    6.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.250
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
  SUBAREA AREA(ACRES) =    0.38      SUBAREA RUNOFF(CFS) =    1.88
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.81

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.17
  FLOW VELOCITY(FEET/SEC.) =  2.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
  LONGEST FLOWPATH FROM NODE   8093.00 TO NODE   8090.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8090.00 TO NODE   8090.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.83
  RAINFALL INTENSITY(INCH/HR) =   6.25
  TOTAL STREAM AREA(ACRES) =     0.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.81

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.30     5.99        6.802          1.91
      2        2.81     6.83        6.250          0.57

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       12.77     5.99       6.802
      2       12.28     6.83       6.250

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.77   Tc(MIN.) =    5.99
  TOTAL AREA(ACRES) =        2.5
  LONGEST FLOWPATH FROM NODE   8093.00 TO NODE   8090.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8090.00 TO NODE   8095.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   679.00  DOWNSTREAM(FEET) =   674.00
  FLOW LENGTH(FEET) =   178.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.64
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.77
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    6.27
  LONGEST FLOWPATH FROM NODE   8093.00 TO NODE   8095.00 =     773.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8095.00 TO NODE   8095.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.27
  RAINFALL INTENSITY(INCH/HR) =   6.61
  TOTAL STREAM AREA(ACRES) =     2.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.77

****************************************************************************
  FLOW PROCESS FROM NODE   8101.00 TO NODE   8102.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (10.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    710.00
  DOWNSTREAM ELEVATION(FEET) =    705.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.264
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.392
  SUBAREA RUNOFF(CFS) =      1.11
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      1.11

****************************************************************************
  FLOW PROCESS FROM NODE   8102.00 TO NODE   8095.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  705.00  DOWNSTREAM ELEVATION(FEET) =  673.00
  STREET LENGTH(FEET) =   691.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.27
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.34
  STREET FLOW TRAVEL TIME(MIN.) =   2.37   Tc(MIN.) =    7.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.814
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (10.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.600
  SUBAREA AREA(ACRES) =    1.23      SUBAREA RUNOFF(CFS) =    4.29
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       5.16

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.23
  FLOW VELOCITY(FEET/SEC.) =  5.32   DEPTH*VELOCITY(FT*FT/SEC.) =   1.65
  LONGEST FLOWPATH FROM NODE   8101.00 TO NODE   8095.00 =     791.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8095.00 TO NODE   8095.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.64
  RAINFALL INTENSITY(INCH/HR) =   5.81
  TOTAL STREAM AREA(ACRES) =     1.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.16

****************************************************************************
  FLOW PROCESS FROM NODE   8098.00 TO NODE   8099.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    682.00
  DOWNSTREAM ELEVATION(FEET) =    681.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.505
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    72.65
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE   8099.00 TO NODE   8095.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    674.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =     0.51   CHANNEL SLOPE = 11.7647
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  35.44
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.00
  Tc(MIN.) =    4.51
  SUBAREA AREA(ACRES) =     0.51       SUBAREA RUNOFF(CFS) =    3.08
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
  TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       3.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =  44.51
  LONGEST FLOWPATH FROM NODE   8098.00 TO NODE   8095.00 =      85.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8095.00 TO NODE   8095.00 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.) =    4.51
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     0.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.98

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       12.77     6.27        6.605          2.48
      2        5.16     7.64        5.814          1.48
      3        3.98     4.51        7.641          0.66

  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       18.07     4.51       7.641
      2       20.45     6.27       6.605
      3       19.43     7.64       5.814

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.45   Tc(MIN.) =    6.27
  TOTAL AREA(ACRES) =        4.6
  LONGEST FLOWPATH FROM NODE   8101.00 TO NODE   8095.00 =     791.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8095.00 TO NODE   8106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   677.00  DOWNSTREAM(FEET) =   674.00
  FLOW LENGTH(FEET) =   299.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.98
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.45
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =    6.89
  LONGEST FLOWPATH FROM NODE   8101.00 TO NODE   8106.00 =    1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8106.00 TO NODE   8106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.89
  RAINFALL INTENSITY(INCH/HR) =   6.21
  TOTAL STREAM AREA(ACRES) =     4.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.45

****************************************************************************
  FLOW PROCESS FROM NODE   8104.00 TO NODE   8105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    745.00
  DOWNSTREAM ELEVATION(FEET) =    743.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.358
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.100
  SUBAREA RUNOFF(CFS) =      0.43
```

```
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE   8105.00 TO NODE   8106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    743.00  DOWNSTREAM(FEET) =    680.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   842.00   CHANNEL SLOPE =  0.0748
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.506
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.09
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =   11.34
  SUBAREA AREA(ACRES) =     2.55       SUBAREA RUNOFF(CFS) =    4.02
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.8         PEAK FLOW RATE(CFS) =       4.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   8.62
  LONGEST FLOWPATH FROM NODE   8104.00 TO NODE   8106.00 =     927.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8106.00 TO NODE   8106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.34
  RAINFALL INTENSITY(INCH/HR) =   4.51
  TOTAL STREAM AREA(ACRES) =     2.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.45     6.89        6.213          4.62
      2        4.40    11.34        4.506          2.79

  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       23.13     6.89       6.213
      2       19.23    11.34       4.506

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.13   Tc(MIN.) =    6.89
  TOTAL AREA(ACRES) =        7.4
  LONGEST FLOWPATH FROM NODE   8101.00 TO NODE   8106.00 =    1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8106.00 TO NODE   8080.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   674.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =   217.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.52
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.13
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    7.23
  LONGEST FLOWPATH FROM NODE   8101.00 TO NODE   8080.00 =    1307.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8080.00 TO NODE   8080.00 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       23.13     7.23       6.021        7.41
  LONGEST FLOWPATH FROM NODE   8101.00 TO NODE   8080.00 =    1307.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        4.38    17.09       3.458        2.89
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8080.00 =    1651.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      24.98       7.23        6.021
      2      17.67      17.09        3.458

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      24.98   Tc(MIN.) =    7.23
  TOTAL AREA(ACRES) =       10.3

****************************************************************************
  FLOW PROCESS FROM NODE   8080.00 TO NODE   8080.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8080.00 TO NODE   8150.00 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) =   657.00
  FLOW LENGTH(FEET) =    66.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.32
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.98
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.28
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8150.00 =    1717.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8150.00 TO NODE   8150.00 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       24.98     7.28       5.998       10.30
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8150.00 =    1717.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       61.01     9.45       5.069       19.33
```

```
  LONGEST FLOWPATH FROM NODE   8018.00 TO NODE   8150.00 =    1512.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      71.98       7.28        5.998
      2      82.12       9.45        5.069

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      82.12   Tc(MIN.) =    9.45
  TOTAL AREA(ACRES) =       29.6

****************************************************************************
  FLOW PROCESS FROM NODE   8150.00 TO NODE   8150.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8150.00 TO NODE   8150.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  18.45   RAIN INTENSITY(INCH/HOUR) =  3.29
  TOTAL AREA(ACRES) =    29.60   TOTAL RUNOFF(CFS) =     39.29

****************************************************************************
  FLOW PROCESS FROM NODE   8150.00 TO NODE   8151.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   658.00  DOWNSTREAM(FEET) =   655.00
  FLOW LENGTH(FEET) =   288.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.47
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      39.29
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   18.96
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8151.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8151.00 TO NODE   8151.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   9000.00 TO NODE   9000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.00   RAIN INTENSITY(INCH/HOUR) =  7.64
  TOTAL AREA(ACRES) =     0.01   TOTAL RUNOFF(CFS) =      0.01

****************************************************************************
  FLOW PROCESS FROM NODE   9000.00 TO NODE   9012.00 IS CODE =  31
----------------------------------------------------------------------------
  ** WARNING: Computed Flowrate is less than 0.1 cfs,
               Routing Algorithm is UNAVAILABLE.

****************************************************************************
  FLOW PROCESS FROM NODE   9012.00 TO NODE   9012.00 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.) =    5.00
```

```
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     0.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.01

****************************************************************************
  FLOW PROCESS FROM NODE   9001.00 TO NODE   9012.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.00   RAIN INTENSITY(INCH/HOUR) =  7.64
  TOTAL AREA(ACRES) =     0.01   TOTAL RUNOFF(CFS) =      0.01

****************************************************************************
  FLOW PROCESS FROM NODE   9012.00 TO NODE   9012.00 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.) =    5.00
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     0.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.01

****************************************************************************
  FLOW PROCESS FROM NODE   9010.00 TO NODE   9011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    745.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.691
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE   9011.00 TO NODE   9012.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    745.00  DOWNSTREAM(FEET) =    706.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   452.00   CHANNEL SLOPE =  0.0863
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.169
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.94
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   1.27
  Tc(MIN.) =    9.16
  SUBAREA AREA(ACRES) =     1.13       SUBAREA RUNOFF(CFS) =    2.04
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.3         PEAK FLOW RATE(CFS) =       2.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE   9010.00 TO NODE   9012.00 =     552.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   9012.00 TO NODE   9012.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.16
  RAINFALL INTENSITY(INCH/HR) =   5.17
  TOTAL STREAM AREA(ACRES) =     1.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.01     5.00        7.641          0.01
      2        0.01     5.00        7.641          0.01
      3        2.42     9.16        5.169          1.34

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        1.34     5.00       7.641
      2        1.34     5.00       7.641
      3        2.44     9.16       5.169

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.44   Tc(MIN.) =    9.16
  TOTAL AREA(ACRES) =        1.4
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   9012.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   9012.00 TO NODE   9013.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   706.00  DOWNSTREAM(FEET) =   676.00
  FLOW LENGTH(FEET) =   665.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.14
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.44
  PIPE TRAVEL TIME(MIN.) =   1.36    Tc(MIN.) =   10.53
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   9013.00 =    2670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   9013.00 TO NODE   9013.00 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.) =   10.53
  RAINFALL INTENSITY(INCH/HR) =   4.73
  TOTAL STREAM AREA(ACRES) =     1.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.44

****************************************************************************
  FLOW PROCESS FROM NODE   9002.00 TO NODE   9013.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   5.00   RAIN INTENSITY(INCH/HOUR) =  7.64
  TOTAL AREA(ACRES) =     0.01   TOTAL RUNOFF(CFS) =      0.01

****************************************************************************
  FLOW PROCESS FROM NODE   9013.00 TO NODE   9013.00 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.) =    5.00
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     0.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.01

****************************************************************************
  FLOW PROCESS FROM NODE   9030.00 TO NODE   9031.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    709.00
  DOWNSTREAM ELEVATION(FEET) =    708.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.900
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    72.65
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.622
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE   9031.00 TO NODE   9013.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    708.00  DOWNSTREAM(FEET) =    676.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   535.00   CHANNEL SLOPE =  0.0598
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.013
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.34
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   13.57
  SUBAREA AREA(ACRES) =     0.31       SUBAREA RUNOFF(CFS) =    0.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   3.85
  LONGEST FLOWPATH FROM NODE   9030.00 TO NODE   9013.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   9032.00 TO NODE   9013.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.013
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    0.53   SUBAREA RUNOFF(CFS) =    0.74
  TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       1.33
  TC(MIN.) =   13.57
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   9013.00 TO NODE   9013.00 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.) =   13.57
  RAINFALL INTENSITY(INCH/HR) =   4.01
  TOTAL STREAM AREA(ACRES) =     0.95
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.33

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.44    10.53        4.727          1.36
      2        0.01     5.00        7.641          0.01
      3        1.33    13.57        4.013          0.95

  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        2.01     5.00       7.641
      2        3.48    10.53       4.727
      3        3.41    13.57       4.013

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.48   Tc(MIN.) =   10.53
  TOTAL AREA(ACRES) =        2.3
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   9013.00 =    2670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   9013.00 TO NODE   8151.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   676.00  DOWNSTREAM(FEET) =   660.00
  FLOW LENGTH(FEET) =   592.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.51
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.48
  PIPE TRAVEL TIME(MIN.) =   1.31    Tc(MIN.) =   11.84
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8151.00 =    3262.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8151.00 TO NODE   8151.00 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        3.48    11.84       4.382        2.32
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8151.00 =    3262.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       39.29    18.96       3.235        29.60
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8151.00 =    2005.00 FEET.

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

```
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      28.02      11.84        4.382
      2      41.86      18.96        3.235

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      41.86   Tc(MIN.) =   18.96
  TOTAL AREA(ACRES) =       31.9

****************************************************************************
  FLOW PROCESS FROM NODE   8151.00 TO NODE   8151.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   8151.00 TO NODE   8160.00 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) =   621.00
  FLOW LENGTH(FEET) =  1273.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.74
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.86
  PIPE TRAVEL TIME(MIN.) =   1.44    Tc(MIN.) =   20.40
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8160.00 =    4535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8160.00 TO NODE   8160.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   7010.00 TO NODE   7010.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  20.47   RAIN INTENSITY(INCH/HOUR) =  3.08
  TOTAL AREA(ACRES) =     4.50   TOTAL RUNOFF(CFS) =      5.54

****************************************************************************
  FLOW PROCESS FROM NODE   7010.00 TO NODE   7030.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   654.00  DOWNSTREAM(FEET) =   653.00
  FLOW LENGTH(FEET) =    58.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.24
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.54
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   20.60
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   7030.00 =    4593.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   7030.00 TO NODE   7030.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.60
  RAINFALL INTENSITY(INCH/HR) =   3.07
  TOTAL STREAM AREA(ACRES) =     4.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.54
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   7031.00 TO NODE   7032.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    656.00
  DOWNSTREAM ELEVATION(FEET) =    655.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.207
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    60.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.80

****************************************************************************
  FLOW PROCESS FROM NODE   7032.00 TO NODE   7030.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  655.00  DOWNSTREAM ELEVATION(FEET) =  652.00
  STREET LENGTH(FEET) =   197.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.49
  STREET FLOW TRAVEL TIME(MIN.) =   1.41   Tc(MIN.) =    4.61
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    0.17      SUBAREA RUNOFF(CFS) =    1.13
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.93

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   5.30
  FLOW VELOCITY(FEET/SEC.) =  2.42   DEPTH*VELOCITY(FT*FT/SEC.) =   0.56
  LONGEST FLOWPATH FROM NODE   7031.00 TO NODE   7030.00 =     297.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   7030.00 TO NODE   7030.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    4.61
  RAINFALL INTENSITY(INCH/HR) =   7.64
  TOTAL STREAM AREA(ACRES) =     0.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.93

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.54    20.60        3.065          4.50
      2        1.93     4.61        7.641          0.29

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        3.17     4.61       7.641
      2        6.31    20.60       3.065

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.31   Tc(MIN.) =   20.60
  TOTAL AREA(ACRES) =        4.8
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   7030.00 =    4593.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   7030.00 TO NODE   8160.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   652.00  DOWNSTREAM(FEET) =   621.00
  FLOW LENGTH(FEET) =   523.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.77
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.31
  PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   21.34
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8160.00 =    5116.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8160.00 TO NODE   8160.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.34
  RAINFALL INTENSITY(INCH/HR) =   3.00
  TOTAL STREAM AREA(ACRES) =     4.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.31

****************************************************************************
  FLOW PROCESS FROM NODE   8164.00 TO NODE   8165.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    656.00
  DOWNSTREAM ELEVATION(FEET) =    654.50
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.971
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    67.50
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
```

```
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.86
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.86

****************************************************************************
  FLOW PROCESS FROM NODE   8165.00 TO NODE   8160.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  652.00  DOWNSTREAM ELEVATION(FEET) =  621.00
  STREET LENGTH(FEET) =   687.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   7.50
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.73
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.28
  STREET FLOW TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =    5.39
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.278
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  SUBAREA AREA(ACRES) =    0.69      SUBAREA RUNOFF(CFS) =    4.37
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       5.19

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.29
  FLOW VELOCITY(FEET/SEC.) =  5.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.65
  LONGEST FLOWPATH FROM NODE   8164.00 TO NODE   8160.00 =     787.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8160.00 TO NODE   8160.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.39
  RAINFALL INTENSITY(INCH/HR) =   7.28
  TOTAL STREAM AREA(ACRES) =     0.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.19

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.31    21.34        2.996          4.79
      2        5.19     5.39        7.278          0.82

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.79     5.39       7.278
      2        8.45    21.34       2.996
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.45   Tc(MIN.) =   21.34
  TOTAL AREA(ACRES) =        5.6
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8160.00 =    5116.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   8160.00 TO NODE   8160.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        8.45    21.34       2.996        5.61
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8160.00 =    5116.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       41.86    20.40       3.085       31.92
  LONGEST FLOWPATH FROM NODE   8070.00 TO NODE   8160.00 =    4535.00 FEET.

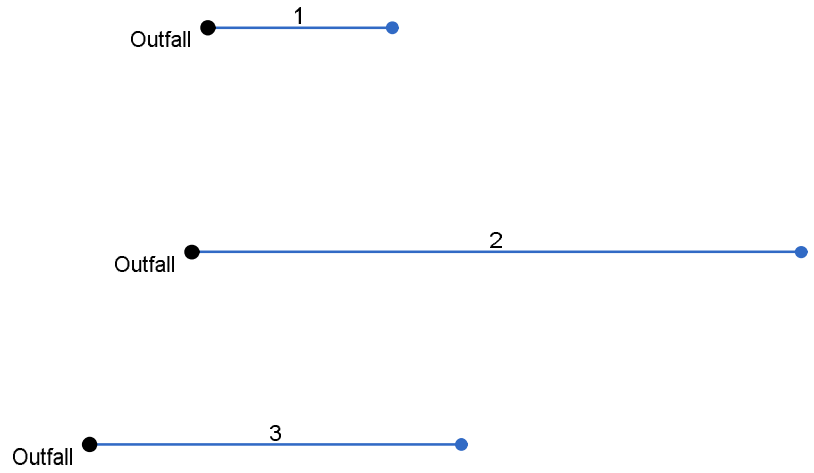
  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      49.93      20.40        3.085
      2      49.10      21.34        2.996

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.93   Tc(MIN.) =   20.40
  TOTAL AREA(ACRES) =       37.5

****************************************************************************
  FLOW PROCESS FROM NODE   8160.00 TO NODE   8160.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       37.5  TC(MIN.) =     20.40
  PEAK FLOW RATE(CFS)   =      49.93
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix 2 – Hydraulic Calculations

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: JUNIPERS.stm	Number of lines: 3	Date: 5/15/2019

My Report

Line No.	Flow Rate (cfs)	Line Size (in)	Line Type	Line Length (ft)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Depth Dn (ft)	Depth Up (ft)	Vel Dn (ft/s)	Vel Up (ft/s)	Jump Loc (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Jump Len (ft)	Line No.
1	78.46	42	Cir	73.000	622.00	634.00	16.44	626.70	636.77	3.50	2.77**	8.16	9.62	....	....	....	....	1
2	17.95	30	Cir	241.000	664.00	677.00	5.39	664.99	678.43	0.99	1.43**	9.92	6.17	....	....	....	....	2
3	36.91	36	Cir	147.000	634.61	648.50	9.45	636.23	650.47	1.62	1.97**	9.48	7.48	....	....	....	....	3

Project File: JUNIPERS.stm | Number of lines: 3 | Date: 5/15/2019

NOTES: ** Critical depth

Detention Basin Calculations

BASIN 1 (BF-1-1)

Basin 1 (BF-1-1)

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 4/29/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 9 MIN.
6 HOUR RAINFALL 2.9 INCHES
BASIN AREA 29.6 ACRES
RUNOFF COEFFICIENT 0.5473
PEAK DISCHARGE 82.12 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 9	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 2.9
TIME (MIN) = 27	DISCHARGE (CFS) = 2.9
TIME (MIN) = 36	DISCHARGE (CFS) = 3
TIME (MIN) = 45	DISCHARGE (CFS) = 3.1
TIME (MIN) = 54	DISCHARGE (CFS) = 3.2
TIME (MIN) = 63	DISCHARGE (CFS) = 3.2
TIME (MIN) = 72	DISCHARGE (CFS) = 3.4
TIME (MIN) = 81	DISCHARGE (CFS) = 3.5
TIME (MIN) = 90	DISCHARGE (CFS) = 3.6
TIME (MIN) = 99	DISCHARGE (CFS) = 3.7
TIME (MIN) = 108	DISCHARGE (CFS) = 3.9
TIME (MIN) = 117	DISCHARGE (CFS) = 4
TIME (MIN) = 126	DISCHARGE (CFS) = 4.3
TIME (MIN) = 135	DISCHARGE (CFS) = 4.4
TIME (MIN) = 144	DISCHARGE (CFS) = 4.7
TIME (MIN) = 153	DISCHARGE (CFS) = 4.9
TIME (MIN) = 162	DISCHARGE (CFS) = 5.4
TIME (MIN) = 171	DISCHARGE (CFS) = 5.6
TIME (MIN) = 180	DISCHARGE (CFS) = 6.2
TIME (MIN) = 189	DISCHARGE (CFS) = 6.6
TIME (MIN) = 198	DISCHARGE (CFS) = 7.6
TIME (MIN) = 207	DISCHARGE (CFS) = 8.2
TIME (MIN) = 216	DISCHARGE (CFS) = 10
TIME (MIN) = 225	DISCHARGE (CFS) = 11.4
TIME (MIN) = 234	DISCHARGE (CFS) = 16.8
TIME (MIN) = 243	DISCHARGE (CFS) = 26.2
TIME (MIN) = 252	DISCHARGE (CFS) = 82.12
TIME (MIN) = 261	DISCHARGE (CFS) = 13.5
TIME (MIN) = 270	DISCHARGE (CFS) = 9
TIME (MIN) = 279	DISCHARGE (CFS) = 7
TIME (MIN) = 288	DISCHARGE (CFS) = 5.9
TIME (MIN) = 297	DISCHARGE (CFS) = 5.1
TIME (MIN) = 306	DISCHARGE (CFS) = 4.6
TIME (MIN) = 315	DISCHARGE (CFS) = 4.2
TIME (MIN) = 324	DISCHARGE (CFS) = 3.8
TIME (MIN) = 333	DISCHARGE (CFS) = 3.5
TIME (MIN) = 342	DISCHARGE (CFS) = 3.3
TIME (MIN) = 351	DISCHARGE (CFS) = 3.1
TIME (MIN) = 360	DISCHARGE (CFS) = 3
TIME (MIN) = 369	DISCHARGE (CFS) = 0

THE JUNIPERS - BASIN BF-1-1

Discharge vs Elevation Table

Bottom orifice diameter:	1 "	Top orifice diameter:	3 "
Number:	1	Number:	1
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.50 ft
Middle orifice diameter:	2 "	Emergency weir:	
number of orif:	1	Invert:	3.50 ft
Cg-middle:	0.61	Weir Length (ft)	10.00 ft
invert elev:	1.50 ft	Riser Box LxW	2x3

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)	Qtot w UD (cfs)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.401
0.55	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.002	0.403
0.60	1.20	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.006	0.407
0.65	1.80	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.009	0.410
0.70	2.40	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.011	0.411
0.75	3.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.413
0.80	3.60	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.014	0.414
0.85	4.20	0.00	0.00	0.00	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.015	0.416
0.90	4.80	0.00	0.00	0.00	0.02	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.016	0.417
0.95	5.40	0.00	0.00	0.00	0.02	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.017	0.418
1.00	6.00	0.00	0.00	0.00	0.02	0.34	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.018	0.419
1.05	6.60	0.00	0.00	0.00	0.02	0.65	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.019	0.420
1.10	7.20	0.00	0.00	0.00	0.02	1.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.020	0.421
1.15	7.80	0.00	0.00	0.00	0.02	1.92	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.021	0.422
1.20	8.40	0.00	0.00	0.00	0.02	3.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.022	0.422
1.25	9.00	0.00	0.00	0.00	0.02	4.60	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.022	0.423
1.30	9.60	0.00	0.00	0.00	0.02	6.74	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.023	0.424
1.35	10.20	0.00	0.00	0.00	0.02	9.61	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.024	0.425
1.40	10.80	0.00	0.00	0.00	0.02	13.38	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.025	0.425
1.45	11.40	0.00	0.00	0.00	0.03	18.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.025	0.426
1.50	12.00	0.00	0.00	0.00	0.03	24.36	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.026	0.427
1.55	12.60	0.30	0.00	0.00	0.03	32.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.030	0.431
1.60	13.20	0.60	0.00	0.00	0.03	41.50	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.040	0.440
1.65	13.80	0.90	0.00	0.00	0.03	53.07	0.03	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.053	0.454
1.70	14.40	1.20	0.00	0.00	0.03	67.08	0.03	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.065	0.466
1.75	15.00	1.50	0.00	0.00	0.03	83.87	0.03	0.04	0.05	0.04	0.00	0.00	0.00	0.00	0.073	0.474
1.80	15.60	1.80	0.00	0.00	0.03	103.84	0.03	0.05	0.06	0.05	0.00	0.00	0.00	0.00	0.080	0.480
1.85	16.20	2.10	0.00	0.00	0.03	127.43	0.03	0.06	0.07	0.06	0.00	0.00	0.00	0.00	0.086	0.486
1.90	16.80	2.40	0.00	0.00	0.03	155.09	0.03	0.06	0.08	0.06	0.00	0.00	0.00	0.00	0.091	0.492
1.95	17.40	2.70	0.00	0.00	0.03	187.34	0.03	0.06	0.08	0.06	0.00	0.00	0.00	0.00	0.096	0.497
2.00	18.00	3.00	0.00	0.00	0.03	224.72	0.03	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.101	0.502
2.05	18.60	3.30	0.00	0.00	0.03	267.80	0.03	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.106	0.507

2.10	19.20	3.60	0.00	0.00	0.03	317.23	0.03	0.08	0.09	0.08	0.00	0.00	0.00	0.00	0.110	0.511
2.15	19.80	3.90	0.00	0.00	0.03	373.67	0.03	0.08	0.12	0.08	0.00	0.00	0.00	0.00	0.114	0.515
2.20	20.40	4.20	0.00	0.00	0.03	437.84	0.03	0.08	0.17	0.08	0.00	0.00	0.00	0.00	0.118	0.519
2.25	21.00	4.50	0.00	0.00	0.03	510.51	0.03	0.09	0.26	0.09	0.00	0.00	0.00	0.00	0.122	0.523
2.30	21.60	4.80	0.00	0.00	0.04	592.48	0.04	0.09	0.41	0.09	0.00	0.00	0.00	0.00	0.126	0.527
2.35	22.20	5.10	0.00	0.00	0.04	684.63	0.04	0.09	0.62	0.09	0.00	0.00	0.00	0.00	0.129	0.530
2.40	22.80	5.40	0.00	0.00	0.04	787.87	0.04	0.10	0.93	0.10	0.00	0.00	0.00	0.00	0.133	0.534
2.45	23.40	5.70	0.00	0.00	0.04	903.17	0.04	0.10	1.36	0.10	0.00	0.00	0.00	0.00	0.136	0.537
2.50	24.00	6.00	0.00	0.00	0.04	1031.55	0.04	0.10	1.94	0.10	0.00	0.00	0.00	0.00	0.140	0.540
2.55	24.60	6.30	0.20	0.00	0.04	1174.09	0.04	0.11	2.71	0.11	0.00	0.00	0.00	0.00	0.147	0.548
2.60	25.20	6.60	0.40	0.00	0.04	1331.93	0.04	0.11	3.70	0.11	0.00	0.02	0.02	0.00	0.162	0.563
2.65	25.80	6.90	0.60	0.00	0.04	1506.26	0.04	0.11	4.96	0.11	0.04	0.03	0.03	0.00	0.183	0.583
2.70	26.40	7.20	0.80	0.00	0.04	1698.35	0.04	0.11	6.53	0.11	0.07	0.06	0.06	0.00	0.208	0.609
2.75	27.00	7.50	1.00	0.00	0.04	1909.52	0.04	0.12	8.47	0.12	0.08	0.08	0.08	0.00	0.236	0.637
2.80	27.60	7.80	1.20	0.00	0.04	2141.14	0.04	0.12	10.84	0.12	0.10	0.11	0.10	0.00	0.258	0.659
2.85	28.20	8.10	1.40	0.00	0.04	2394.66	0.04	0.12	13.70	0.12	0.11	0.13	0.11	0.00	0.275	0.676
2.90	28.80	8.40	1.60	0.00	0.04	2671.61	0.04	0.12	17.13	0.12	0.13	0.16	0.13	0.00	0.290	0.690
2.95	29.40	8.70	1.80	0.00	0.04	2973.56	0.04	0.12	21.20	0.12	0.14	0.18	0.14	0.00	0.303	0.704
3.00	30.00	9.00	2.00	0.00	0.04	3302.17	0.04	0.13	26.00	0.13	0.15	0.20	0.15	0.00	0.316	0.717
3.05	30.60	9.30	2.20	0.00	0.04	3659.16	0.04	0.13	31.61	0.13	0.16	0.21	0.16	0.00	0.328	0.729
3.10	31.20	9.60	2.40	0.00	0.04	4046.33	0.04	0.13	38.14	0.13	0.17	0.22	0.17	0.00	0.340	0.741
3.15	31.80	9.90	2.60	0.00	0.04	4465.55	0.04	0.13	45.70	0.13	0.17	0.22	0.17	0.00	0.351	0.752
3.20	32.40	10.20	2.80	0.00	0.04	4918.76	0.04	0.14	54.39	0.14	0.18	0.22	0.18	0.00	0.362	0.762
3.25	33.00	10.50	3.00	0.00	0.04	5408.00	0.04	0.14	64.34	0.14	0.19	0.22	0.19	0.00	0.372	0.773
3.30	33.60	10.80	3.20	0.00	0.04	5935.36	0.04	0.14	75.67	0.14	0.20	0.22	0.20	0.00	0.382	0.782
3.35	34.20	11.10	3.40	0.00	0.04	6503.02	0.04	0.14	88.53	0.14	0.20	0.24	0.20	0.00	0.391	0.792
3.40	34.80	11.40	3.60	0.00	0.05	7113.25	0.05	0.14	103.06	0.14	0.21	0.26	0.21	0.00	0.401	0.801
3.45	35.40	11.70	3.80	0.00	0.05	7768.41	0.05	0.15	119.42	0.15	0.22	0.30	0.22	0.00	0.410	0.810
3.50	36.00	12.00	4.00	0.00	0.05	8470.91	0.05	0.15	137.77	0.15	0.22	0.37	0.22	0.00	0.419	0.819
3.55	36.60	12.30	4.20	0.06	0.05	9223.28	0.05	0.15	158.29	0.15	0.23	0.47	0.23	0.37	0.799	1.200
3.60	37.20	12.60	4.40	0.12	0.05	10028.13	0.05	0.15	181.17	0.15	0.24	0.62	0.24	1.05	1.489	1.889
3.65	37.80	12.90	4.60	0.18	0.05	10888.14	0.05	0.15	206.59	0.15	0.24	0.83	0.24	1.93	2.378	2.779
3.70	38.40	13.20	4.80	0.24	0.05	11806.11	0.05	0.16	234.76	0.16	0.25	1.12	0.25	2.98	3.430	3.831
3.75	39.00	13.50	5.00	0.30	0.05	12784.92	0.05	0.16	265.90	0.16	0.25	1.49	0.25	4.16	4.622	5.023
3.80	39.60	13.80	5.20	0.36	0.05	13827.53	0.05	0.16	300.23	0.16	0.26	1.96	0.26	5.47	5.939	6.340
3.85	40.20	14.10	5.40	0.42	0.05	14937.02	0.05	0.16	337.99	0.16	0.27	2.57	0.27	6.90	7.370	7.771
3.90	40.80	14.40	5.60	0.48	0.05	16116.54	0.05	0.16	379.44	0.16	0.27	3.32	0.27	8.42	8.907	9.308
3.95	41.40	14.70	5.80	0.54	0.05	17369.36	0.05	0.16	424.82	0.16	0.28	4.24	0.28	10.05	10.542	10.943
4.00	42.00	15.00	6.00	0.60	0.05	18698.83	0.05	0.17	474.42	0.17	0.28	5.36	0.28	11.77	12.271	12.672
4.05	42.60	15.30	6.20	0.66	0.05	20108.43	0.05	0.17	528.52	0.17	0.29	6.70	0.29	13.58	14.087	14.488
4.10	43.20	15.60	6.40	0.72	0.05	21601.72	0.05	0.17	587.42	0.17	0.29	8.31	0.29	15.48	15.988	16.389
4.15	43.80	15.90	6.60	0.78	0.05	23182.36	0.05	0.17	651.41	0.17	0.30	10.20	0.30	17.45	17.969	18.370
4.20	44.40	16.20	6.80	0.84	0.05	24854.13	0.05	0.17	720.84	0.17	0.30	12.42	0.30	19.50	20.028	20.429
4.25	45.00	16.50	7.00	0.90	0.05	26620.91	0.05	0.17	796.03	0.17	0.31	15.00	0.31	21.63	22.161	22.562
4.30	45.60	16.80	7.20	0.96	0.05	28486.69	0.05	0.18	877.34	0.18	0.31	17.99	0.31	23.83	24.366	24.767
4.35	46.20	17.10	7.40	1.02	0.05	30455.58	0.05	0.18	965.12	0.18	0.32	21.43	0.32	26.10	26.641	27.042
4.40	46.80	17.40	7.60	1.08	0.05	32531.79	0.05	0.18	1059.76	0.18	0.32	25.37	0.32	28.43	28.984	29.385
4.45	47.40	17.70	7.80	1.14	0.05	34719.63	0.05	0.18	1161.65	0.18	0.32	29.87	0.32	30.83	31.392	31.793
4.50	48.00	18.00	8.00	1.20	0.05	37023.56	0.05	0.18	1271.19	0.18	0.33	34.96	0.33	33.30	33.865	34.265
4.55	48.60	18.30	8.20	1.26	0.05	39448.12	0.05	0.18	1388.80	0.18	0.33	40.72	0.33	35.83	36.399	36.800
4.60	49.20	18.60	8.40	1.32	0.05	41997.99	0.05	0.19	1514.93	0.19	0.34	47.20	0.34	38.42	38.995	39.396
4.65	49.80	18.90	8.60	1.38	0.05	44677.97	0.05	0.19	1650.01	0.19	0.34	54.47	0.34	41.07	41.650	42.051
4.70	50.40	19.20	8.80	1.44	0.05	47492.96	0.05	0.19	1794.53	0.19	0.35	62.59	0.35	43.77	44.363	44.764
4.75	51.00	19.50	9.00	1.50	0.05	50448.01	0.05	0.19	1948.96	0.19	0.35	71.64	0.35	46.54	47.133	47.534
4.80	51.60	19.80	9.20	1.56	0.06	53548.26	0.06	0.19	2113.80	0.19	0.35	81.69	0.35	49.36	49.959	50.360
4.85	52.20	20.10	9.40	1.62	0.06	56799.02	0.06	0.19	2289.57	0.19	0.36	92.82	0.36	52.23	52.840	53.241
4.90	52.80	20.40	9.60	1.68	0.06	60205.68	0.06	0.19	2476.80	0.19	0.36	105.11	0.36	55.16	55.774	56.175

4.95	53.40	20.70	9.80	1.74	0.06	63773.78	0.06	0.20	2676.05	0.20	0.37	118.66	0.37	58.14	58.761	59.162
5.00	54.00	21.00	10.00	1.80	0.06	67509.00	0.06	0.20	2887.86	0.20	0.37	133.55	0.37	61.18	61.800	62.201
5.05	54.60	21.30	10.20	1.86	0.06	71417.13	0.06	0.20	3112.84	0.20	0.37	149.88	0.37	64.26	64.890	65.291
5.10	55.20	21.60	10.40	1.92	0.06	75504.11	0.06	0.20	3351.59	0.20	0.38	167.75	0.38	67.39	68.030	68.431
5.15	55.80	21.90	10.60	1.98	0.06	79776.00	0.06	0.20	3604.71	0.20	0.38	187.26	0.38	70.58	71.219	71.620
5.20	56.40	22.20	10.80	2.04	0.06	84239.00	0.06	0.20	3872.86	0.20	0.39	208.52	0.39	73.81	74.457	74.857
5.25	57.00	22.50	11.00	2.10	0.06	88899.46	0.06	0.20	4156.69	0.20	0.39	231.66	0.39	77.09	77.742	78.143
5.30	57.60	22.80	11.20	2.16	0.06	93763.84	0.06	0.21	4456.87	0.21	0.39	256.77	0.39	80.42	81.075	81.476
5.35	58.20	23.10	11.40	2.22	0.06	98838.78	0.06	0.21	4774.09	0.21	0.40	284.00	0.40	83.79	84.454	84.855
5.40	58.80	23.40	11.60	2.28	0.06	104131.02	0.06	0.21	5109.08	0.21	0.40	313.47	0.40	87.21	87.879	88.280
5.45	59.40	23.70	11.80	2.34	0.06	109647.47	0.06	0.21	5462.57	0.21	0.40	345.31	0.40	90.68	91.350	91.751
5.50	60.00	24.00	12.00	2.40	0.06	115395.17	0.06	0.21	5835.30	0.21	0.41	379.66	0.41	94.19	94.865	95.266
5.55	60.60	24.30	12.20	2.46	0.06	121381.33	0.06	0.21	6228.06	0.21	0.41	416.66	0.41	97.74	98.424	98.825
5.60	61.20	24.60	12.40	2.52	0.06	127613.27	0.06	0.21	6641.63	0.21	0.41	456.47	0.41	101.34	102.027	102.428
5.65	61.80	24.90	12.60	2.58	0.06	134098.49	0.06	0.22	7076.84	0.22	0.42	499.23	0.42	104.98	105.673	106.073
5.70	62.40	25.20	12.80	2.64	0.06	140844.63	0.06	0.22	7534.51	0.22	0.42	545.12	0.42	108.66	109.361	109.762
5.75	63.00	25.50	13.00	2.70	0.06	147859.48	0.06	0.22	8015.51	0.22	0.42	594.29	0.42	112.39	113.091	113.492
5.80	63.60	25.80	13.20	2.76	0.06	155150.98	0.06	0.22	8520.71	0.22	0.43	646.91	0.43	116.15	116.863	117.264
5.85	64.20	26.10	13.40	2.82	0.06	162727.25	0.06	0.22	9051.01	0.22	0.43	703.17	0.43	119.96	120.676	121.077
5.90	64.80	26.40	13.60	2.88	0.06	170596.52	0.06	0.22	9607.34	0.22	0.43	763.25	0.43	123.81	124.530	124.931
5.95	65.40	26.70	13.80	2.94	0.06	178767.23	0.06	0.22	10190.63	0.22	0.44	827.33	0.44	127.70	128.424	128.825
6.00	66.00	27.00	14.00	3.00	0.06	187247.94	0.06	0.22	10801.86	0.22	0.44	895.62	0.44	131.63	132.358	132.759

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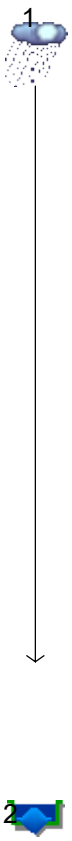
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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

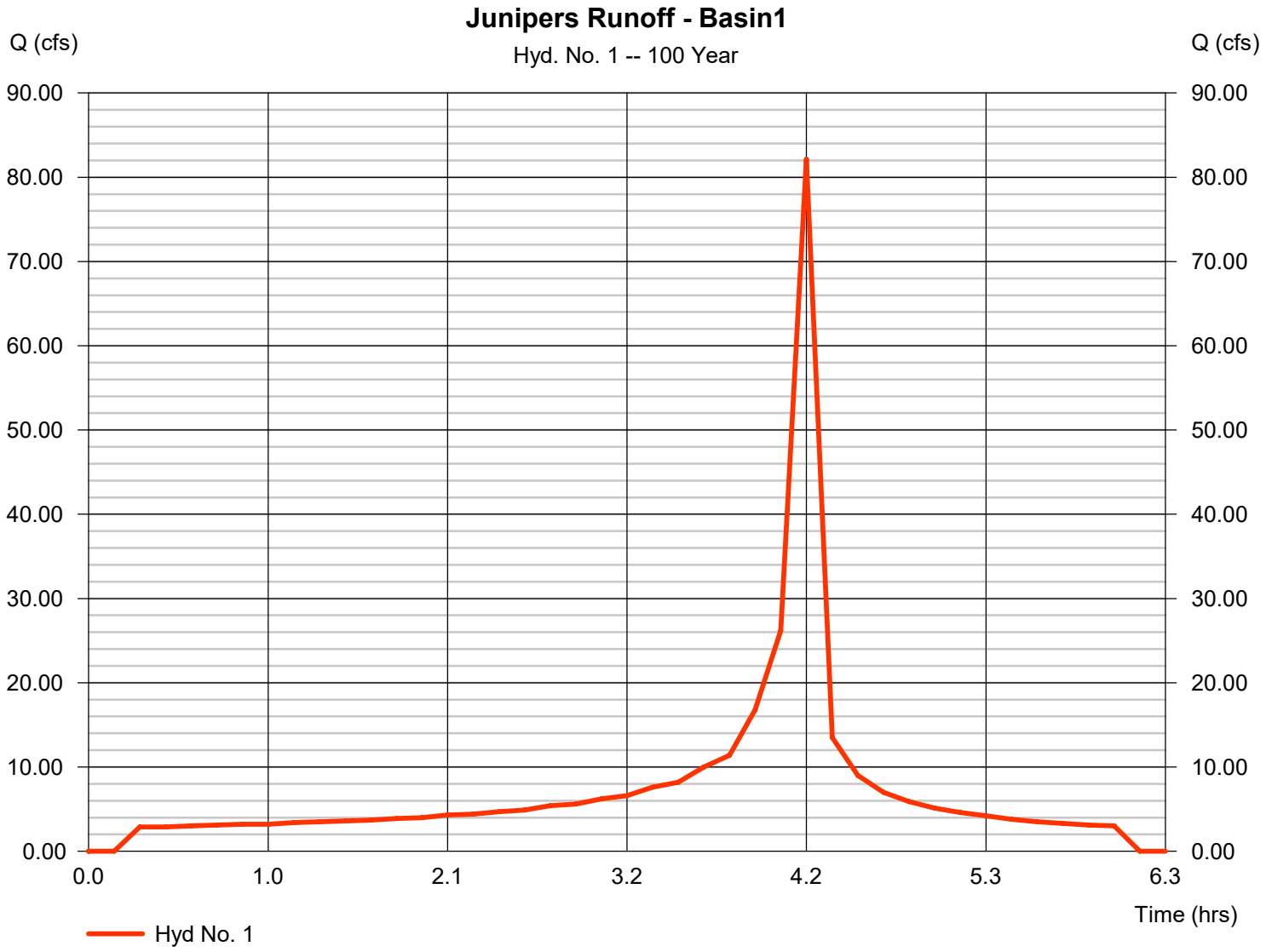
Hyd.	Origin	Description
1	Manual	Junipers Runoff - Basin1
2	Reservoir	Junipers Deten Basin1

Hydrograph Report

Hyd. No. 1

Junipers Runoff - Basin1

Hydrograph type	= Manual	Peak discharge	= 82.12 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 9 min	Hyd. volume	= 167,843 cuft



Hydrograph Report

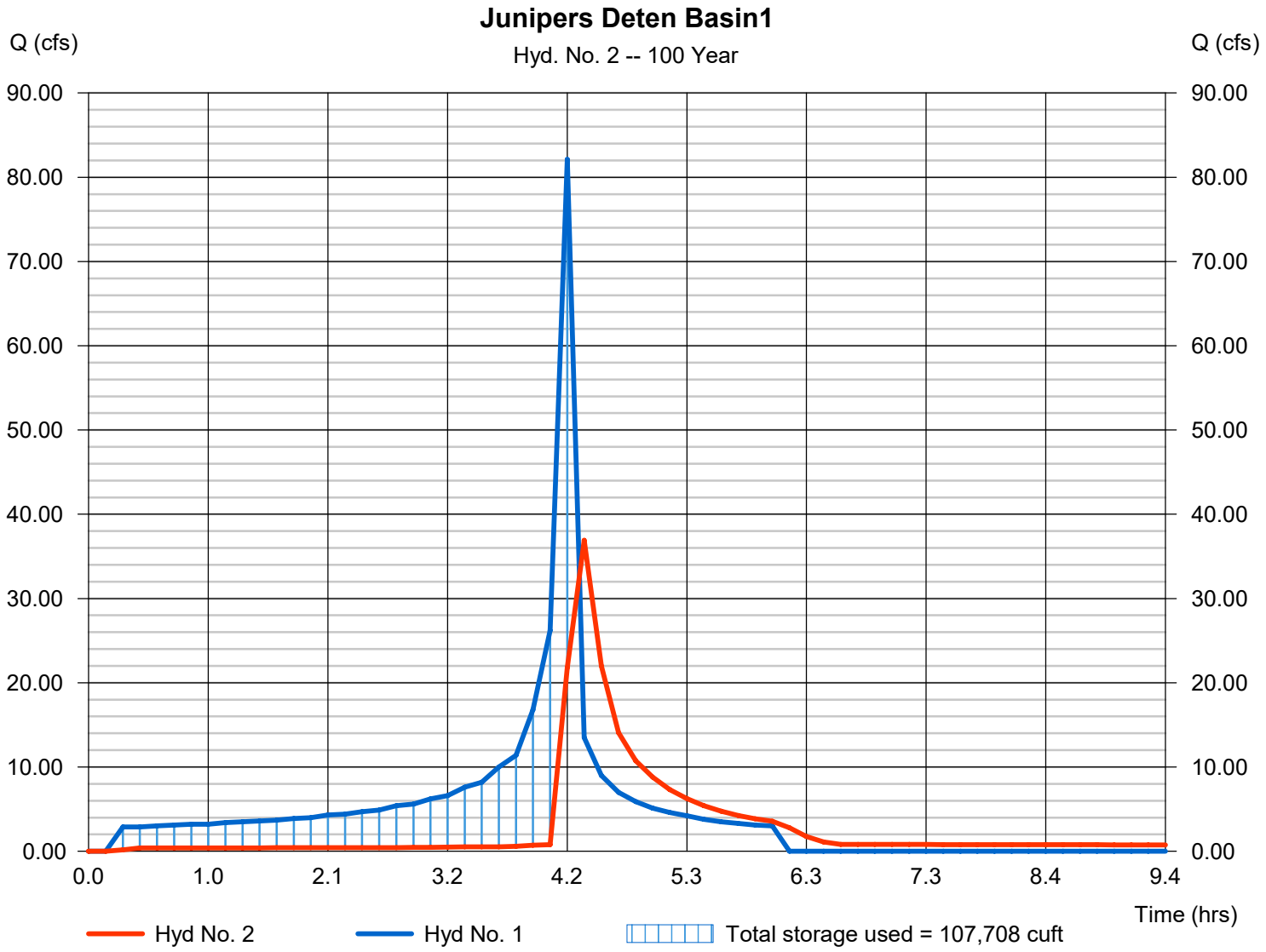
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 05 / 1 / 2019

Hyd. No. 2

Junipers Deten Basin1

Hydrograph type	= Reservoir	Peak discharge	= 36.91 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.35 hrs
Time interval	= 9 min	Hyd. volume	= 167,838 cuft
Inflow hyd. No.	= 1 - Junipers Runoff - Basin1	Max. Elevation	= 638.75 ft
Reservoir name	= Junipers Detention Basin1	Max. Storage	= 107,708 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Junipers Detention Basin1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 634.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	634.00	17,216	0	0
0.10	634.10	17,494	1,735	1,735
0.50	634.50	18,606	7,218	8,953
1.00	635.00	19,996	9,647	18,601
1.50	635.50	21,417	10,350	28,951
2.00	636.00	22,838	11,061	40,012
2.50	636.50	24,290	11,779	51,791
3.00	637.00	25,741	12,505	64,296
3.50	637.50	27,223	13,238	77,533
4.00	638.00	28,705	13,979	91,512
4.50	638.50	30,218	14,728	106,240
5.00	639.00	31,730	15,484	121,724
5.50	639.50	33,274	16,248	137,972
6.00	640.00	34,817	17,020	154,991

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	Inactive
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	634.00	---	---	---	---	---	---	---	---	---	---	0.000
0.10	1,735	634.10	---	---	---	---	---	---	---	---	---	0.401	0.401
0.50	8,953	634.50	---	---	---	---	---	---	---	---	---	0.402	0.402
1.00	18,601	635.00	---	---	---	---	---	---	---	---	---	0.419	0.419
1.50	28,951	635.50	---	---	---	---	---	---	---	---	---	0.427	0.427
2.00	40,012	636.00	---	---	---	---	---	---	---	---	---	0.502	0.502
2.50	51,791	636.50	---	---	---	---	---	---	---	---	---	0.540	0.540
3.00	64,296	637.00	---	---	---	---	---	---	---	---	---	0.717	0.717
3.50	77,533	637.50	---	---	---	---	---	---	---	---	---	0.819	0.819
4.00	91,512	638.00	---	---	---	---	---	---	---	---	---	12.67	12.67
4.50	106,240	638.50	---	---	---	---	---	---	---	---	---	34.26	34.26
5.00	121,724	639.00	---	---	---	---	---	---	---	---	---	62.20	62.20
5.50	137,972	639.50	---	---	---	---	---	---	---	---	---	95.27	95.27
6.00	154,991	640.00	---	---	---	---	---	---	---	---	---	132.76	132.76

BASIN 3 (BF-2-3)

RATIONAL METHOD HYDROGRAPH PROGRAM
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Basin 3 (BF-2-3)

RUN DATE 12/5/2018
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.9 INCHES
BASIN AREA 10.9 ACRES
RUNOFF COEFFICIENT 0.76
PEAK DISCHARGE 52.29 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 1.4
TIME (MIN) = 14	DISCHARGE (CFS) = 1.5
TIME (MIN) = 21	DISCHARGE (CFS) = 1.5
TIME (MIN) = 28	DISCHARGE (CFS) = 1.5
TIME (MIN) = 35	DISCHARGE (CFS) = 1.6
TIME (MIN) = 42	DISCHARGE (CFS) = 1.6
TIME (MIN) = 49	DISCHARGE (CFS) = 1.6
TIME (MIN) = 56	DISCHARGE (CFS) = 1.7
TIME (MIN) = 63	DISCHARGE (CFS) = 1.7
TIME (MIN) = 70	DISCHARGE (CFS) = 1.7
TIME (MIN) = 77	DISCHARGE (CFS) = 1.8
TIME (MIN) = 84	DISCHARGE (CFS) = 1.8
TIME (MIN) = 91	DISCHARGE (CFS) = 1.9
TIME (MIN) = 98	DISCHARGE (CFS) = 2
TIME (MIN) = 105	DISCHARGE (CFS) = 2
TIME (MIN) = 112	DISCHARGE (CFS) = 2.1
TIME (MIN) = 119	DISCHARGE (CFS) = 2.2
TIME (MIN) = 126	DISCHARGE (CFS) = 2.2
TIME (MIN) = 133	DISCHARGE (CFS) = 2.4
TIME (MIN) = 140	DISCHARGE (CFS) = 2.4
TIME (MIN) = 147	DISCHARGE (CFS) = 2.6
TIME (MIN) = 154	DISCHARGE (CFS) = 2.7
TIME (MIN) = 161	DISCHARGE (CFS) = 2.9
TIME (MIN) = 168	DISCHARGE (CFS) = 3
TIME (MIN) = 175	DISCHARGE (CFS) = 3.2
TIME (MIN) = 182	DISCHARGE (CFS) = 3.4
TIME (MIN) = 189	DISCHARGE (CFS) = 3.7
TIME (MIN) = 196	DISCHARGE (CFS) = 4
TIME (MIN) = 203	DISCHARGE (CFS) = 4.6
TIME (MIN) = 210	DISCHARGE (CFS) = 4.9
TIME (MIN) = 217	DISCHARGE (CFS) = 6
TIME (MIN) = 224	DISCHARGE (CFS) = 6.9
TIME (MIN) = 231	DISCHARGE (CFS) = 10.1
TIME (MIN) = 238	DISCHARGE (CFS) = 12.9
TIME (MIN) = 245	DISCHARGE (CFS) = 52.29
TIME (MIN) = 252	DISCHARGE (CFS) = 8.1
TIME (MIN) = 259	DISCHARGE (CFS) = 5.4
TIME (MIN) = 266	DISCHARGE (CFS) = 4.2
TIME (MIN) = 273	DISCHARGE (CFS) = 3.5
TIME (MIN) = 280	DISCHARGE (CFS) = 3.1
TIME (MIN) = 287	DISCHARGE (CFS) = 2.8
TIME (MIN) = 294	DISCHARGE (CFS) = 2.5
TIME (MIN) = 301	DISCHARGE (CFS) = 2.3
TIME (MIN) = 308	DISCHARGE (CFS) = 2.1
TIME (MIN) = 315	DISCHARGE (CFS) = 2
TIME (MIN) = 322	DISCHARGE (CFS) = 1.9
TIME (MIN) = 329	DISCHARGE (CFS) = 1.8
TIME (MIN) = 336	DISCHARGE (CFS) = 1.7
TIME (MIN) = 343	DISCHARGE (CFS) = 1.6
TIME (MIN) = 350	DISCHARGE (CFS) = 1.5
TIME (MIN) = 357	DISCHARGE (CFS) = 1.5
TIME (MIN) = 364	DISCHARGE (CFS) = 0

THE JUNIPERS - BASIN BF-2-3

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "
Number:	6	Number:	6
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	1.70 ft
Middle orifice diameter:	3 "	Emergency weir:	
number of orif:	6	Invert:	3.00 ft
Cg-middle:	0.61	Weir Length (	4.00 ft
invert elev:	1.10 ft	Riser Box LxW	1x1

h	H/D-low	H/D-mid	H/D-top	H/D-peak	Qlow-orif	Qlow-weir	Qtot-low	Qmid-orif	Qmid-weir	Qtot-med	Qtop-orif	Qtop-weir	Qtot-top	Qpeak-top	Qtot
(ft)	-	-	-	-	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.55	0.30	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.020
0.60	0.60	0.00	0.00	0.00	0.08	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.073
0.65	0.90	0.00	0.00	0.00	0.17	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.149
0.70	1.20	0.00	0.00	0.00	0.22	0.23	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.219
0.75	1.50	0.00	0.00	0.00	0.26	0.32	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.262
0.80	1.80	0.00	0.00	0.00	0.30	0.39	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.298
0.85	2.10	0.00	0.00	0.00	0.33	0.44	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.331
0.90	2.40	0.00	0.00	0.00	0.36	0.47	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.361
0.95	2.70	0.00	0.00	0.00	0.39	0.48	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.388
1.00	3.00	0.00	0.00	0.00	0.41	0.48	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.414
1.05	3.30	0.00	0.00	0.00	0.44	0.50	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.438
1.10	3.60	0.00	0.00	0.00	0.46	0.56	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.461
1.15	3.90	0.20	0.00	0.00	0.48	0.72	0.48	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.507
1.20	4.20	0.40	0.00	0.00	0.50	1.03	0.50	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.598
1.25	4.50	0.60	0.00	0.00	0.52	1.57	0.52	0.23	0.20	0.20	0.00	0.00	0.00	0.00	0.724
1.30	4.80	0.80	0.00	0.00	0.54	2.43	0.54	0.39	0.34	0.34	0.00	0.00	0.00	0.00	0.878
1.35	5.10	1.00	0.00	0.00	0.56	3.73	0.56	0.51	0.49	0.49	0.00	0.00	0.00	0.00	1.048
1.40	5.40	1.20	0.00	0.00	0.58	5.59	0.58	0.60	0.65	0.60	0.00	0.00	0.00	0.00	1.182
1.45	5.70	1.40	0.00	0.00	0.60	8.18	0.60	0.68	0.80	0.68	0.00	0.00	0.00	0.00	1.280
1.50	6.00	1.60	0.00	0.00	0.61	11.67	0.61	0.76	0.95	0.76	0.00	0.00	0.00	0.00	1.370
1.55	6.30	1.80	0.00	0.00	0.63	16.27	0.63	0.82	1.07	0.82	0.00	0.00	0.00	0.00	1.452
1.60	6.60	2.00	0.00	0.00	0.65	22.20	0.65	0.88	1.17	0.88	0.00	0.00	0.00	0.00	1.529
1.65	6.90	2.20	0.00	0.00	0.66	29.74	0.66	0.94	1.25	0.94	0.00	0.00	0.00	0.00	1.602
1.70	7.20	2.40	0.00	0.00	0.68	39.17	0.68	0.99	1.29	0.99	0.00	0.00	0.00	0.00	1.671
1.75	7.50	2.60	0.15	0.00	0.69	50.81	0.69	1.04	1.31	1.04	0.00	0.03	0.03	0.00	1.766
1.80	7.80	2.80	0.30	0.00	0.71	65.03	0.71	1.09	1.32	1.09	0.00	0.11	0.11	0.00	1.912
1.85	8.10	3.00	0.45	0.00	0.72	82.21	0.72	1.14	1.32	1.14	0.00	0.24	0.24	0.00	2.103
1.90	8.40	3.20	0.60	0.00	0.74	102.77	0.74	1.18	1.35	1.18	0.47	0.41	0.41	0.00	2.333
1.95	8.70	3.40	0.75	0.00	0.75	127.19	0.75	1.23	1.41	1.23	0.74	0.62	0.62	0.00	2.592
2.00	9.00	3.60	0.90	0.00	0.76	155.98	0.76	1.27	1.55	1.27	0.94	0.84	0.84	0.00	2.873
2.05	9.30	3.80	1.05	0.00	0.78	189.67	0.78	1.31	1.80	1.31	1.10	1.08	1.08	0.00	3.166
2.10	9.60	4.00	1.20	0.00	0.79	228.86	0.79	1.35	2.21	1.35	1.24	1.33	1.24	0.00	3.376
2.15	9.90	4.20	1.35	0.00	0.80	274.19	0.80	1.39	2.84	1.39	1.36	1.57	1.36	0.00	3.553
2.20	10.20	4.40	1.50	0.00	0.81	326.33	0.81	1.42	3.75	1.42	1.48	1.80	1.48	0.00	3.718
2.25	10.50	4.60	1.65	0.00	0.83	386.02	0.83	1.46	5.00	1.46	1.59	2.01	1.59	0.00	3.874
2.30	10.80	4.80	1.80	0.00	0.84	454.02	0.84	1.49	6.70	1.49	1.69	2.20	1.69	0.00	4.022
2.35	11.10	5.00	1.95	0.00	0.85	531.18	0.85	1.53	8.93	1.53	1.78	2.36	1.78	0.00	4.163
2.40	11.40	5.20	2.10	0.00	0.86	618.37	0.86	1.56	11.79	1.56	1.87	2.49	1.87	0.00	4.298
2.45	11.70	5.40	2.25	0.00	0.88	716.52	0.88	1.60	15.41	1.60	1.96	2.58	1.96	0.00	4.429
2.50	12.00	5.60	2.40	0.00	0.89	826.64	0.89	1.63	19.91	1.63	2.04	2.65	2.04	0.00	4.555
2.55	12.30	5.80	2.55	0.00	0.90	949.76	0.90	1.66	25.44	1.66	2.12	2.69	2.12	0.00	4.677
2.60	12.60	6.00	2.70	0.00	0.91	1087.00	0.91	1.69	32.15	1.69	2.19	2.70	2.19	0.00	4.796
2.65	12.90	6.20	2.85	0.00	0.92	1239.51	0.92	1.72	40.22	1.72	2.27	2.71	2.27	0.00	4.911
2.70	13.20	6.40	3.00	0.00	0.93	1408.54	0.93	1.75	49.83	1.75	2.34	2.72	2.34	0.00	5.023
2.75	13.50	6.60	3.15	0.00	0.94	1595.38	0.94	1.78	61.18	1.78	2.41	2.75	2.41	0.00	5.133
2.80	13.80	6.80	3.30	0.00	0.95	1801.37	0.95	1.81	74.49	1.81	2.48	2.82	2.48	0.00	5.240
2.85	14.10	7.00	3.45	0.00	0.96	2027.96	0.96	1.84	90.00	1.84	2.54	2.95	2.54	0.00	5.344
2.90	14.40	7.20	3.60	0.00	0.98	2276.63	0.98	1.87	107.94	1.87	2.61	3.18	2.61	0.00	5.447
2.95	14.70	7.40	3.75	0.00	0.99	2548.95	0.99	1.89	128.60	1.89	2.67	3.54	2.67	0.00	5.547
3.00	15.00	7.60	3.90	0.00	1.00	2846.54	1.00	1.92	152.25	1.92	2.73	4.07	2.73	0.00	5.646
3.05	15.30	7.80	4.05	0.15	1.01	3171.13	1.01	1.95	179.20	1.95	2.79	4.82	2.79	0.15	5.891
3.10	15.60	8.00	4.20	0.30	1.02	3524.49	1.02	1.97	209.78	1.97	2.85	5.83	2.85	0.42	6.258
3.15	15.90	8.20	4.35	0.45	1.03	3908.49	1.03	2.00	244.32	2.00	2.90	7.16	2.90	0.77	6.704
3.20	16.20	8.40	4.50	0.60	1.04	4325.05	1.04	2.03	283.21	2.03	2.96	8.88	2.96	1.19	7.214
3.25	16.50	8.60	4.65	0.75	1.05	4776.20	1.05	2.05	326.81	2.05	3.01	11.05	3.01	1.66	7.778
3.30	16.80	8.80	4.80	0.90	1.06	5264.04	1.06	2.08	375.54	2.08	3.07	13.75	3.07	2.19	8.390
3.35	17.10	9.00	4.95	1.05	1.07	5790.74	1.07	2.10	429.83	2.10	3.12	17.07	3.12	2.76	9.047
3.40	17.40	9.20	5.10	1.20	1.08	6358.57	1.08	2.13	490.12	2.13	3.17	21.08	3.17	3.37	9.745
3.45	17.70	9.40	5.25	1.35	1.08	6969.89	1.08	2.15	556.91	2.15	3.23	25.90	3.23	4.02	10.482
3.50	18.00	9.60	5.40	1.50	1.09	7627.12	1.09	2.17	630.67	2.17	3.28	31.63	3.28	4.71	11.254
3.55	18.30	9.80	5.55	1.65	1.10	8332.80	1.10	2.20	711.95	2.20	3.33	38.37	3.33	5.43	12.061
3.60	18.60	10.00	5.70	1.80	1.11	9089.55	1.11	2.22	801.29	2.22	3.37	46.26	3.37	6.19	12.900
3.65	18.90	10.20	5.85	1.95	1.12	9900.07	1.12	2.25	899.26	2.25	3.42	55.42	3.42	6.98	13.770
3.70	19.20	10.40	6.00	2.10	1.13	10767.17	1.13	2.27	1006.47	2.27	3.47	66.00	3.47	7.80	14.671

3.75	19.50	10.60	6.15	2.25	1.14	11693.75	1.14	2.29	1123.54	2.29	3.52	78.14	3.52	8.65	15.600
3.80	19.80	10.80	6.30	2.40	1.15	12682.81	1.15	2.31	1251.14	2.31	3.56	92.01	3.56	9.53	16.558
3.85	20.10	11.00	6.45	2.55	1.16	13737.43	1.16	2.34	1389.94	2.34	3.61	107.77	3.61	10.44	17.542
3.90	20.40	11.20	6.60	2.70	1.17	14860.82	1.17	2.36	1540.65	2.36	3.65	125.60	3.65	11.37	18.553
3.95	20.70	11.40	6.75	2.85	1.18	16056.27	1.18	2.38	1704.02	2.38	3.70	145.69	3.70	12.33	19.589
4.00	21.00	11.60	6.90	3.00	1.18	17327.19	1.18	2.40	1880.82	2.40	3.74	168.24	3.74	13.32	20.650
4.05	21.30	11.80	7.05	3.15	1.19	18677.07	1.19	2.42	2071.85	2.42	3.79	193.46	3.79	14.33	21.735
4.10	21.60	12.00	7.20	3.30	1.20	20109.53	1.20	2.44	2277.95	2.44	3.83	221.58	3.83	15.37	22.844
4.15	21.90	12.20	7.35	3.45	1.21	21628.28	1.21	2.47	2499.97	2.47	3.87	252.83	3.87	16.43	23.976
4.20	22.20	12.40	7.50	3.60	1.22	23237.17	1.22	2.49	2738.81	2.49	3.92	287.45	3.92	17.51	25.130
4.25	22.50	12.60	7.65	3.75	1.23	24940.12	1.23	2.51	2995.41	2.51	3.96	325.70	3.96	18.62	26.307
4.30	22.80	12.80	7.80	3.90	1.24	26741.19	1.24	2.53	3270.72	2.53	4.00	367.86	4.00	19.74	27.505
4.35	23.10	13.00	7.95	4.05	1.24	28644.55	1.24	2.55	3565.73	2.55	4.04	414.20	4.04	20.89	28.725
4.40	23.40	13.20	8.10	4.20	1.25	30654.49	1.25	2.57	3881.49	2.57	4.08	465.03	4.08	22.06	29.965
4.45	23.70	13.40	8.25	4.35	1.26	32775.40	1.26	2.59	4219.05	2.59	4.12	520.64	4.12	23.26	31.226
4.50	24.00	13.60	8.40	4.50	1.27	35011.81	1.27	2.61	4579.51	2.61	4.16	581.37	4.16	24.47	32.507
4.55	24.30	13.80	8.55	4.65	1.28	37368.35	1.28	2.63	4964.01	2.63	4.20	647.54	4.20	25.70	33.808
4.60	24.60	14.00	8.70	4.80	1.28	39849.80	1.28	2.65	5373.72	2.65	4.24	719.52	4.24	26.96	35.128
4.65	24.90	14.20	8.85	4.95	1.29	42461.04	1.29	2.67	5809.85	2.67	4.28	797.66	4.28	28.23	36.468
4.70	25.20	14.40	9.00	5.10	1.30	45207.08	1.30	2.69	6273.66	2.69	4.31	882.35	4.31	29.52	37.826
4.75	25.50	14.60	9.15	5.25	1.31	48093.06	1.31	2.71	6766.42	2.71	4.35	973.97	4.35	30.84	39.203
4.80	25.80	14.80	9.30	5.40	1.32	51124.26	1.32	2.73	7289.46	2.73	4.39	1072.94	4.39	32.17	40.599
4.85	26.10	15.00	9.45	5.55	1.32	54306.07	1.32	2.75	7844.15	2.75	4.43	1179.69	4.43	33.52	42.013
4.90	26.40	15.20	9.60	5.70	1.33	57644.02	1.33	2.76	8431.90	2.76	4.46	1294.65	4.46	34.88	43.444
4.95	26.70	15.40	9.75	5.85	1.34	61143.79	1.34	2.78	9054.14	2.78	4.50	1418.28	4.50	36.27	44.893
5.00	27.00	15.60	9.90	6.00	1.35	64811.17	1.35	2.80	9712.36	2.80	4.54	1551.05	4.54	37.67	46.360

Hydraflow Table of Contents

1286-Detention Basin3_Study.gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 12 / 6 / 2018

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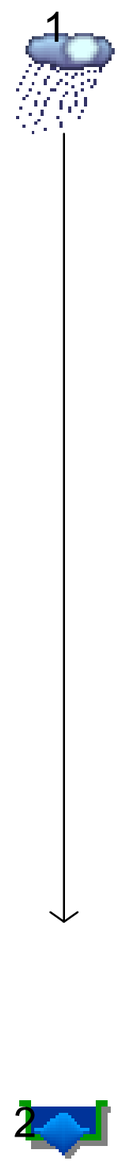
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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

Hyd.	Origin	Description
1	Manual	Junipers Runoff - Basin2
2	Reservoir	Junipers Deten Basin3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

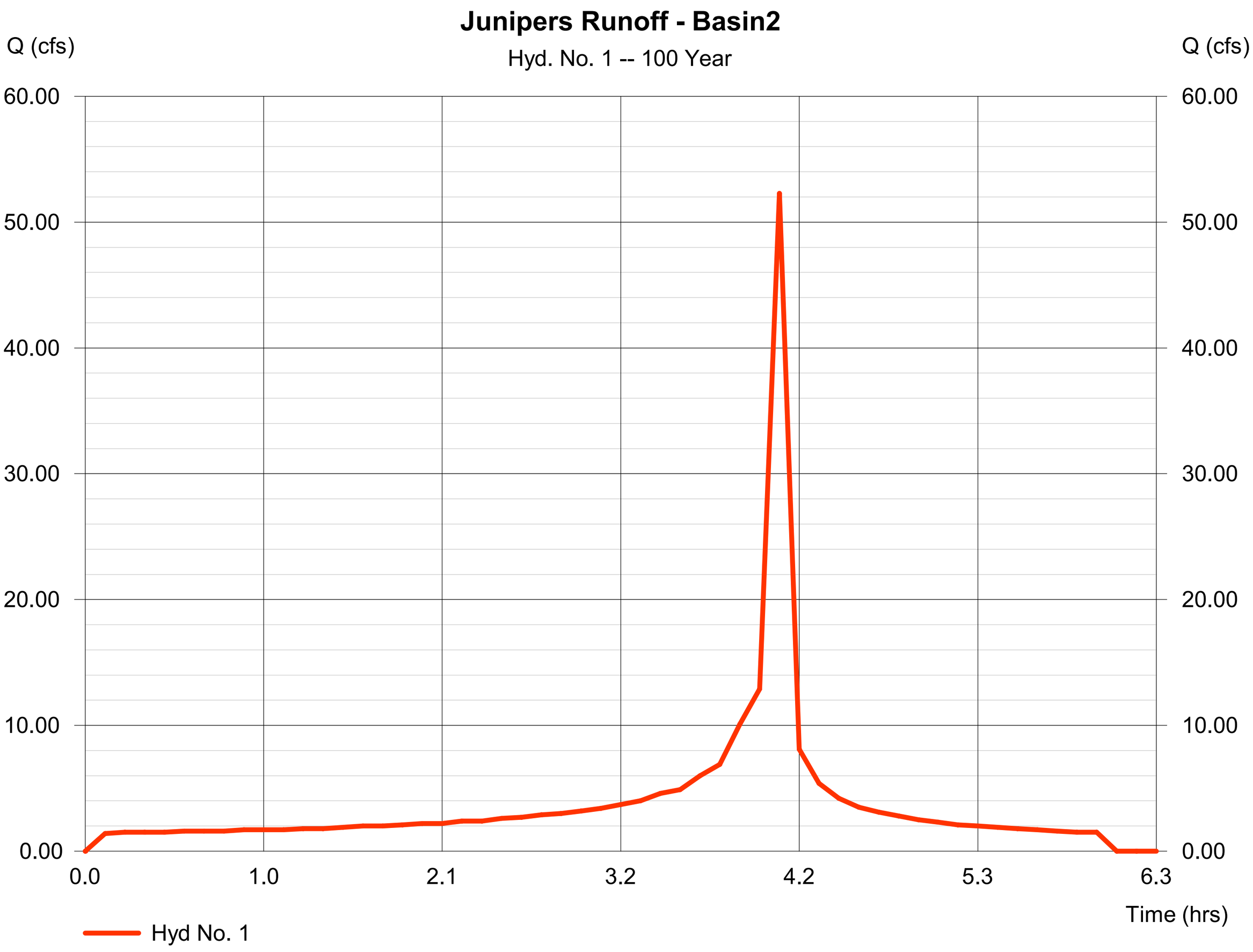
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	52.29	7	245	86,432	------	------	------	Junipers Runoff - Basin2
2	Reservoir	17.95	7	252	82,041	1	670.00	44,259	Junipers Deten Basin3

Hydrograph Report

Hyd. No. 1

Junipers Runoff - Basin2

Hydrograph type	= Manual	Peak discharge	= 52.29 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 86,432 cuft



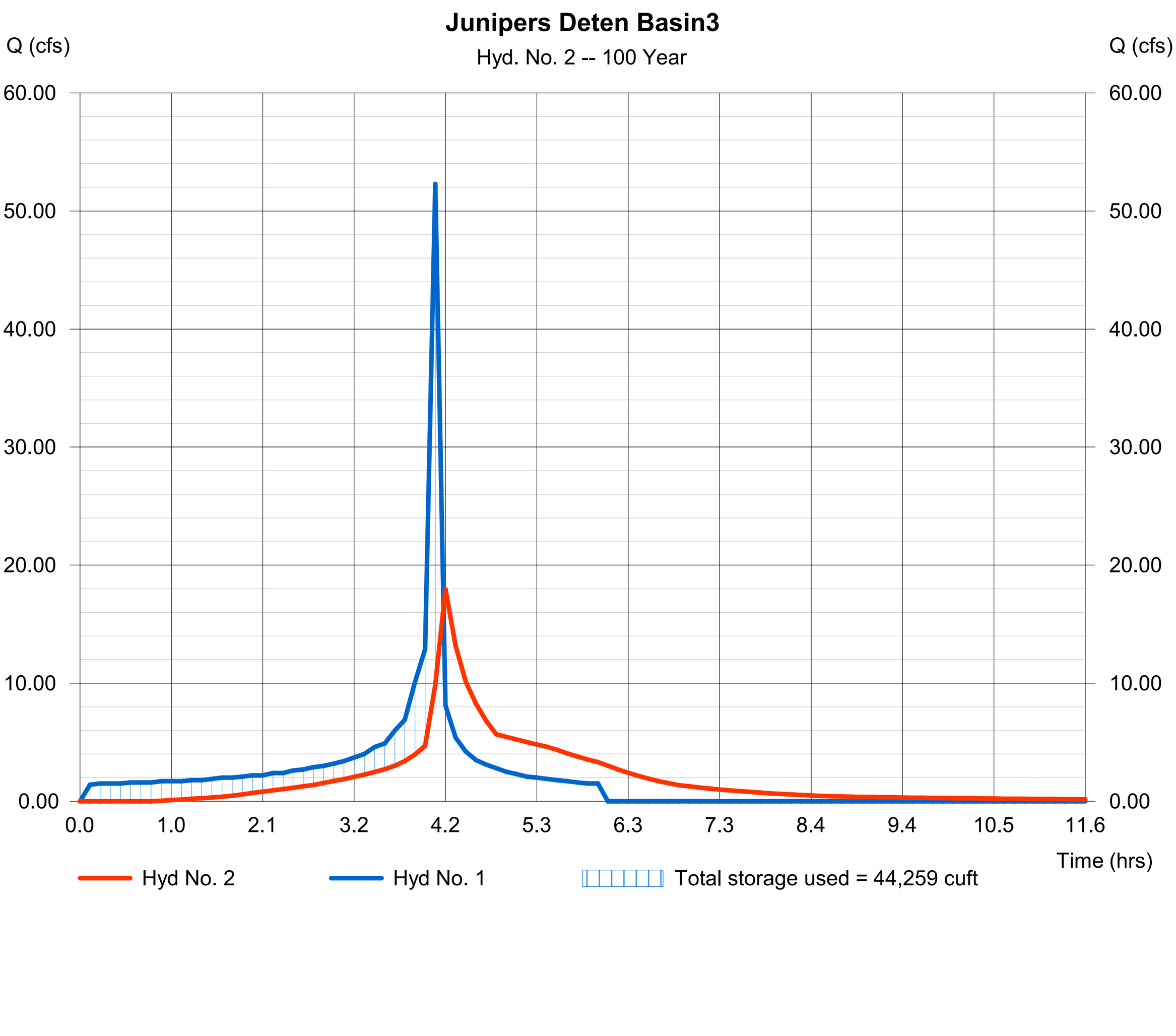
Hydrograph Report

Hyd. No. 2

Junipers Deten Basin3

Hydrograph type	=	Reservoir	Peak discharge	=	17.95 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.20 hrs
Time interval	=	7 min	Hyd. volume	=	82,041 cuft
Inflow hyd. No.	=	1 - Junipers Runoff - Basin2	Max. Elevation	=	670.00 ft
Reservoir name	=	Junipers Detention Basin2	Max. Storage	=	44,259 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Junipers Detention Basin2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 666.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	666.00	8,372	0	0
0.50	666.50	9,152	4,379	4,379
1.00	667.00	9,931	4,769	9,148
1.50	667.50	10,739	5,166	14,314
2.00	668.00	11,547	5,570	19,883
2.50	668.50	12,383	5,981	25,864
3.00	669.00	13,220	6,399	32,263
3.50	669.50	14,085	6,824	39,088
4.00	670.00	14,950	7,257	46,344
4.50	670.50	15,844	7,697	54,041
5.00	671.00	16,738	8,144	62,185

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	Inactive
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	666.00	---	---	---	---	---	---	---	---	---	---	0.000
0.50	4,379	666.50	---	---	---	---	---	---	---	---	---	---	0.000
1.00	9,148	667.00	---	---	---	---	---	---	---	---	---	0.410	0.410
1.50	14,314	667.50	---	---	---	---	---	---	---	---	---	1.370	1.370
2.00	19,883	668.00	---	---	---	---	---	---	---	---	---	2.870	2.870
2.50	25,864	668.50	---	---	---	---	---	---	---	---	---	4.550	4.550
3.00	32,263	669.00	---	---	---	---	---	---	---	---	---	5.650	5.650
3.50	39,088	669.50	---	---	---	---	---	---	---	---	---	11.25	11.25
4.00	46,344	670.00	---	---	---	---	---	---	---	---	---	20.65	20.65
4.50	54,041	670.50	---	---	---	---	---	---	---	---	---	32.51	32.51
5.00	62,185	671.00	---	---	---	---	---	---	---	---	---	46.36	46.36

BASIN 4 (BF-2-4)

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 2/26/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 12 MIN.
6 HOUR RAINFALL 2.9 INCHES
BASIN AREA 60.4 ACRES
RUNOFF COEFFICIENT 0.63
PEAK DISCHARGE 162.5 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 12	DISCHARGE (CFS) = 6.6
TIME (MIN) = 24	DISCHARGE (CFS) = 6.8
TIME (MIN) = 36	DISCHARGE (CFS) = 7.1
TIME (MIN) = 48	DISCHARGE (CFS) = 7.3
TIME (MIN) = 60	DISCHARGE (CFS) = 7.7
TIME (MIN) = 72	DISCHARGE (CFS) = 7.9
TIME (MIN) = 84	DISCHARGE (CFS) = 8.4
TIME (MIN) = 96	DISCHARGE (CFS) = 8.6
TIME (MIN) = 108	DISCHARGE (CFS) = 9.3
TIME (MIN) = 120	DISCHARGE (CFS) = 9.6
TIME (MIN) = 132	DISCHARGE (CFS) = 10.5
TIME (MIN) = 144	DISCHARGE (CFS) = 11
TIME (MIN) = 156	DISCHARGE (CFS) = 12.1
TIME (MIN) = 168	DISCHARGE (CFS) = 12.9
TIME (MIN) = 180	DISCHARGE (CFS) = 14.8
TIME (MIN) = 192	DISCHARGE (CFS) = 16
TIME (MIN) = 204	DISCHARGE (CFS) = 19.6
TIME (MIN) = 216	DISCHARGE (CFS) = 22.3
TIME (MIN) = 228	DISCHARGE (CFS) = 32.7
TIME (MIN) = 240	DISCHARGE (CFS) = 48.9
TIME (MIN) = 252	DISCHARGE (CFS) = 162.5
TIME (MIN) = 264	DISCHARGE (CFS) = 26.3
TIME (MIN) = 276	DISCHARGE (CFS) = 17.6
TIME (MIN) = 288	DISCHARGE (CFS) = 13.7
TIME (MIN) = 300	DISCHARGE (CFS) = 11.5
TIME (MIN) = 312	DISCHARGE (CFS) = 10
TIME (MIN) = 324	DISCHARGE (CFS) = 8.9
TIME (MIN) = 336	DISCHARGE (CFS) = 8.1
TIME (MIN) = 348	DISCHARGE (CFS) = 7.5
TIME (MIN) = 360	DISCHARGE (CFS) = 6.9
TIME (MIN) = 372	DISCHARGE (CFS) = 0

THE JUNIPERS - BASIN BF-2-4

Discharge vs Elevation Table

Bottom orifice diameter:	4 "	Top orifice diameter:	12 "
Number:	6	Number:	6
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.00 ft
Middle orifice diameter:	8 "	Emergency weir:	
number of orif:	6	Invert:	4.00 ft
Cg-middle:	0.61	Weir Length (ft)	32.00 ft
invert elev:	1.25 ft	Riser Box LxW	8x8

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)	Qtot + SUB (cfs)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.097
0.55	0.15	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.029	1.126
0.60	0.30	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.112	1.209
0.65	0.45	0.00	0.00	0.00	0.00	0.24	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.242	1.339
0.70	0.60	0.00	0.00	0.00	0.47	0.41	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.413	1.510
0.75	0.75	0.00	0.00	0.00	0.74	0.62	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.615	1.712
0.80	0.90	0.00	0.00	0.00	0.94	0.84	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.841	1.938
0.85	1.05	0.00	0.00	0.00	1.10	1.08	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.081	2.178
0.90	1.20	0.00	0.00	0.00	1.24	1.33	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.238	2.335
0.95	1.35	0.00	0.00	0.00	1.36	1.57	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.364	2.461
1.00	1.50	0.00	0.00	0.00	1.48	1.80	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.480	2.577
1.05	1.65	0.00	0.00	0.00	1.59	2.01	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.587	2.684
1.10	1.80	0.00	0.00	0.00	1.69	2.20	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.687	2.784
1.15	1.95	0.00	0.00	0.00	1.78	2.36	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.782	2.879
1.20	2.10	0.00	0.00	0.00	1.87	2.49	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.872	2.969
1.25	2.25	0.00	0.00	0.00	1.96	2.58	1.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.958	3.055
1.30	2.40	0.08	0.00	0.00	2.04	2.65	2.04	0.00	0.04	0.04	0.00	0.00	0.00	0.00	2.082	3.179
1.35	2.55	0.15	0.00	0.00	2.12	2.69	2.12	0.00	0.16	0.16	0.00	0.00	0.00	0.00	2.284	3.381
1.40	2.70	0.23	0.00	0.00	2.19	2.70	2.19	0.00	0.36	0.36	0.00	0.00	0.00	0.00	2.558	3.655
1.45	2.85	0.30	0.00	0.00	2.27	2.71	2.27	0.00	0.63	0.63	0.00	0.00	0.00	0.00	2.902	3.999
1.50	3.00	0.38	0.00	0.00	2.34	2.72	2.34	0.00	0.97	0.97	0.00	0.00	0.00	0.00	3.311	4.408
1.55	3.15	0.45	0.00	0.00	2.41	2.75	2.41	0.00	1.37	1.37	0.00	0.00	0.00	0.00	3.780	4.877
1.60	3.30	0.53	0.00	0.00	2.48	2.82	2.48	1.32	1.83	1.83	0.00	0.00	0.00	0.00	4.303	5.400
1.65	3.45	0.60	0.00	0.00	2.54	2.95	2.54	2.65	2.33	2.33	0.00	0.00	0.00	0.00	4.876	5.973
1.70	3.60	0.68	0.00	0.00	2.61	3.18	2.61	3.50	2.89	2.89	0.00	0.00	0.00	0.00	5.493	6.590
1.75	3.75	0.75	0.00	0.00	2.67	3.54	2.67	4.19	3.48	3.48	0.00	0.00	0.00	0.00	6.147	7.244
1.80	3.90	0.83	0.00	0.00	2.73	4.07	2.73	4.77	4.10	4.10	0.00	0.00	0.00	0.00	6.833	7.930
1.85	4.05	0.90	0.00	0.00	2.79	4.82	2.79	5.29	4.76	4.76	0.00	0.00	0.00	0.00	7.544	8.641
1.90	4.20	0.98	0.00	0.00	2.85	5.83	2.85	5.77	5.43	5.43	0.00	0.00	0.00	0.00	8.274	9.371
1.95	4.35	1.05	0.00	0.00	2.90	7.16	2.90	6.21	6.11	6.11	0.00	0.00	0.00	0.00	9.017	10.114
2.00	4.50	1.13	0.00	0.00	2.96	8.88	2.96	6.62	6.81	6.62	0.00	0.00	0.00	0.00	9.578	10.675
2.05	4.65	1.20	0.05	0.00	3.01	11.05	3.01	7.00	7.50	7.00	0.00	0.05	0.05	0.00	10.072	11.169
2.10	4.80	1.28	0.10	0.00	3.07	13.75	3.07	7.37	8.19	7.37	0.00	0.21	0.21	0.00	10.644	11.741
2.15	4.95	1.35	0.15	0.00	3.12	17.07	3.12	7.72	8.87	7.72	0.00	0.45	0.45	0.00	11.294	12.391
2.20	5.10	1.43	0.20	0.00	3.17	21.08	3.17	8.05	9.54	8.05	0.00	0.80	0.80	0.00	12.021	13.118
2.25	5.25	1.50	0.25	0.00	3.23	25.90	3.23	8.37	10.18	8.37	0.00	1.23	1.23	0.00	12.825	13.922
2.30	5.40	1.58	0.30	0.00	3.28	31.63	3.28	8.68	10.80	8.68	0.00	1.75	1.75	0.00	13.701	14.798
2.35	5.55	1.65	0.35	0.00	3.33	38.37	3.33	8.98	11.38	8.98	0.00	2.35	2.35	0.00	14.649	15.746
2.40	5.70	1.73	0.40	0.00	3.37	46.26	3.37	9.27	11.94	9.27	0.00	3.02	3.02	0.00	15.664	16.761
2.45	5.85	1.80	0.45	0.00	3.42	55.42	3.42	9.54	12.45	9.54	0.00	3.78	3.78	0.00	16.744	17.841
2.50	6.00	1.88	0.50	0.00	3.47	66.00	3.47	9.82	12.92	9.82	0.00	4.60	4.60	0.00	17.886	18.983
2.55	6.15	1.95	0.55	0.00	3.52	78.14	3.52	10.08	13.35	10.08	5.16	5.49	5.49	0.00	19.084	20.181
2.60	6.30	2.03	0.60	0.00	3.56	92.01	3.56	10.34	13.74	10.34	7.29	6.43	6.43	0.00	20.335	21.432
2.65	6.45	2.10	0.65	0.00	3.61	107.77	3.61	10.59	14.08	10.59	8.93	7.44	7.44	0.00	21.635	22.732
2.70	6.60	2.18	0.70	0.00	3.65	125.60	3.65	10.83	14.37	10.83	10.32	8.49	8.49	0.00	22.978	24.075
2.75	6.75	2.25	0.75	0.00	3.70	145.69	3.70	11.07	14.62	11.07	11.53	9.59	9.59	0.00	24.362	25.459
2.80	6.90	2.33	0.80	0.00	3.74	168.24	3.74	11.31	14.82	11.31	12.63	10.73	10.73	0.00	25.780	26.877
2.85	7.05	2.40	0.85	0.00	3.79	193.46	3.79	11.54	14.98	11.54	13.65	11.90	11.90	0.00	27.228	28.325
2.90	7.20	2.48	0.90	0.00	3.83	221.58	3.83	11.76	15.10	11.76	14.59	13.11	13.11	0.00	28.701	29.798
2.95	7.35	2.55	0.95	0.00	3.87	252.83	3.87	11.99	15.19	11.99	15.47	14.34	14.34	0.00	30.194	31.291
3.00	7.50	2.63	1.00	0.00	3.92	287.45	3.92	12.20	15.25	12.20	16.31	15.58	15.58	0.00	31.703	32.800
3.05	7.65	2.70	1.05	0.00	3.96	325.70	3.96	12.42	15.28	12.42	17.11	16.85	16.85	0.00	33.221	34.318
3.10	7.80	2.78	1.10	0.00	4.00	367.86	4.00	12.63	15.30	12.63	17.87	18.12	17.87	0.00	34.493	35.590
3.15	7.95	2.85	1.15	0.00	4.04	414.20	4.04	12.83	15.32	12.83	18.60	19.40	18.60	0.00	35.470	36.567
3.20	8.10	2.92	1.20	0.00	4.08	465.03	4.08	13.04	15.34	13.04	19.30	20.67	19.30	0.00	36.416	37.513
3.25	8.25	3.00	1.25	0.00	4.12	520.64	4.12	13.24	15.37	13.24	19.98	21.95	19.98	0.00	37.333	38.430
3.30	8.40	3.07	1.30	0.00	4.16	581.37	4.16	13.43	15.43	13.43	20.63	23.21	20.63	0.00	38.225	39.322
3.35	8.55	3.15	1.35	0.00	4.20	647.54	4.20	13.63	15.53	13.63	21.27	24.45	21.27	0.00	39.094	40.191
3.40	8.70	3.22	1.40	0.00	4.24	719.52	4.24	13.82	15.69	13.82	21.88	25.68	21.88	0.00	39.941	41.038
3.45	8.85	3.30	1.45	0.00	4.28	797.66	4.28	14.01	15.93	14.01	22.48	26.88	22.48	0.00	40.768	41.865
3.50	9.00	3.37	1.50	0.00	4.31	882.35	4.31	14.19	16.25	14.19	23.07	28.06	23.07	0.00	41.577	42.674
3.55	9.15	3.45	1.55	0.00	4.35	973.97	4.35	14.38	16.69	14.38	23.64	29.20	23.64	0.00	42.368	43.465
3.60	9.30	3.52	1.60	0.00	4.39	1072.94	4.39	14.56	17.27	14.56	24.19	30.31	24.19	0.00	43.144	44.241
3.65	9.45	3.60	1.65	0.00	4.43	1179.69	4.43	14.74	18.00	14.74	24.74	31.37	24.74	0.00	43.904	45.001
3.70	9.60	3.67	1.70	0.00	4.46	1294.65	4.46	14.92	18.92	14.92	25.27	32.40	25.27	0.00	44.650	45.747
3.75	9.75	3.75	1.75	0.00	4.50	1418.28	4.50	15.09	20.04	15.09	25.79	33.38	25.79	0.00	45.383	46.480
3.80	9.90	3.82	1.80	0.00	4.54	1551.05	4.54	15.26	21.41	15.26	26.30	34.31	26.30	0.00	46.103	47.200
3.85	10.05	3.90	1.85	0.00	4.57	1693.46	4.57	15.44	23.05	15.44	26.80	35.19	26.80	0.00	46.812	47.909
3.90	10.20	3.97	1.90	0.00	4.61	1846.01	4.61	15.60	24.99	15.60	27.29	36.03	27.29	0.00	47.509	48.606
3.95	10.35	4.05	1.95	0.00	4.64	2009.22	4.64	15.77	27.26	15.77	27.78	36.80	27.78	0.00	48.195	49.292
4.00	10.50	4.12	2.00	0.00	4.68	2183.64	4.68	15.94	29.92	15.94	28.25	37.52	28.25	0.00	48.871	49.968

4.05	10.65	4.20	2.05	0.02	4.71	2369.82	4.71	16.10	32.98	16.10	28.72	38.19	28.72	1.19	50.728	51.825
4.10	10.80	4.27	2.10	0.04	4.75	2568.34	4.75	16.26	36.51	16.26	29.18	38.80	29.18	3.37	53.563	54.660
4.15	10.95	4.35	2.15	0.06	4.78	2779.80	4.78	16.43	40.52	16.43	29.63	39.35	29.63	6.19	57.031	58.128
4.20	11.10	4.42	2.20	0.07	4.82	3004.80	4.82	16.58	45.09	16.58	30.08	39.84	30.08	9.53	61.011	62.108
4.25	11.25	4.50	2.25	0.09	4.85	3243.99	4.85	16.74	50.24	16.74	30.52	40.28	30.52	13.32	65.431	66.528
4.30	11.40	4.57	2.30	0.11	4.89	3498.02	4.89	16.90	56.03	16.90	30.95	40.67	30.95	17.51	70.243	71.340
4.35	11.55	4.65	2.35	0.13	4.92	3767.55	4.92	17.05	62.52	17.05	31.38	41.00	31.38	22.06	75.413	76.510
4.40	11.70	4.72	2.40	0.15	4.95	4053.27	4.95	17.21	69.76	17.21	31.80	41.28	31.80	26.96	80.914	82.011
4.45	11.85	4.80	2.45	0.17	4.99	4355.90	4.99	17.36	77.80	17.36	32.21	41.52	32.21	32.17	86.724	87.821
4.50	12.00	4.87	2.50	0.19	5.02	4676.17	5.02	17.51	86.71	17.51	32.62	41.71	32.62	37.67	92.826	93.923
4.55	12.15	4.95	2.55	0.21	5.05	5014.83	5.05	17.66	96.54	17.66	33.03	41.86	33.03	43.46	99.203	100.300
4.60	12.30	5.02	2.60	0.22	5.08	5372.66	5.08	17.81	107.37	17.81	33.43	41.97	33.43	49.52	105.844	106.941
4.65	12.45	5.10	2.65	0.24	5.12	5750.43	5.12	17.95	119.26	17.95	33.82	42.06	33.82	55.84	112.737	113.834
4.70	12.60	5.17	2.70	0.26	5.15	6148.98	5.15	18.10	132.29	18.10	34.22	42.12	34.22	62.41	119.871	120.968
4.75	12.75	5.25	2.75	0.28	5.18	6569.13	5.18	18.24	146.52	18.24	34.60	42.16	34.60	69.21	127.239	128.336
4.80	12.90	5.32	2.80	0.30	5.21	7011.75	5.21	18.39	162.03	18.39	34.98	42.19	34.98	76.25	134.832	135.929
4.85	13.05	5.40	2.85	0.32	5.24	7477.71	5.24	18.53	178.90	18.53	35.36	42.21	35.36	83.51	142.643	143.740
4.90	13.20	5.47	2.90	0.34	5.27	7967.92	5.27	18.67	197.22	18.67	35.74	42.24	35.74	90.98	150.665	151.762
4.95	13.35	5.55	2.95	0.36	5.30	8483.31	5.30	18.81	217.06	18.81	36.11	42.29	36.11	98.67	158.893	159.990
5.00	13.50	5.62	3.00	0.37	5.34	9024.82	5.34	18.95	238.52	18.95	36.47	42.35	36.47	106.56	167.321	168.418
5.05	13.65	5.70	3.05	0.39	5.37	9593.42	5.37	19.09	261.69	19.09	36.84	42.45	36.84	114.65	175.944	177.041
5.10	13.80	5.77	3.10	0.41	5.40	10190.12	5.40	19.23	286.65	19.23	37.20	42.60	37.20	122.94	184.757	185.854
5.15	13.95	5.85	3.15	0.43	5.43	10815.92	5.43	19.36	313.52	19.36	37.55	42.80	37.55	131.41	193.756	194.853
5.20	14.10	5.92	3.20	0.45	5.46	11471.88	5.46	19.50	342.39	19.50	37.90	43.07	37.90	140.08	202.937	204.034
5.25	14.25	6.00	3.25	0.47	5.49	12159.07	5.49	19.63	373.36	19.63	38.25	43.43	38.25	148.92	212.296	213.393
5.30	14.40	6.07	3.30	0.49	5.52	12878.57	5.52	19.77	406.54	19.77	38.60	43.88	38.60	157.95	221.829	222.926
5.35	14.55	6.15	3.35	0.51	5.55	13631.51	5.55	19.90	442.05	19.90	38.94	44.45	38.94	167.15	231.534	232.631
5.40	14.70	6.22	3.40	0.52	5.58	14419.02	5.58	20.03	479.99	20.03	39.28	45.15	39.28	176.52	241.407	242.504
5.45	14.85	6.30	3.45	0.54	5.61	15242.28	5.61	20.16	520.49	20.16	39.62	46.00	39.62	186.06	251.444	252.541
5.50	15.00	6.37	3.50	0.56	5.64	16102.49	5.64	20.29	563.66	20.29	39.96	47.01	39.96	195.76	261.644	262.741
5.55	15.15	6.45	3.55	0.58	5.66	17000.85	5.66	20.42	609.63	20.42	40.29	48.20	40.29	205.63	272.003	273.100
5.60	15.30	6.52	3.60	0.60	5.69	17938.63	5.69	20.55	658.53	20.55	40.62	49.60	40.62	215.66	282.519	283.616
5.65	15.45	6.60	3.65	0.62	5.72	18917.09	5.72	20.68	710.49	20.68	40.94	51.22	40.94	225.85	293.189	294.286
5.70	15.60	6.67	3.70	0.64	5.75	19937.54	5.75	20.80	765.65	20.80	41.27	53.09	41.27	236.19	304.011	305.108
5.75	15.75	6.75	3.75	0.66	5.78	21001.31	5.78	20.93	824.14	20.93	41.59	55.23	41.59	246.69	314.983	316.080
5.80	15.90	6.82	3.80	0.67	5.81	22109.74	5.81	21.05	886.11	21.05	41.91	57.66	41.91	257.34	326.103	327.200
5.85	16.05	6.90	3.85	0.69	5.84	23264.23	5.84	21.18	951.71	21.18	42.22	60.41	42.22	268.13	337.369	338.466
5.90	16.20	6.97	3.90	0.71	5.86	24466.18	5.86	21.30	1021.09	21.30	42.54	63.51	42.54	279.08	348.778	349.875
5.95	16.35	7.05	3.95	0.73	5.89	25717.04	5.89	21.42	1094.40	21.42	42.85	66.97	42.85	290.17	360.329	361.426
6.00	16.50	7.12	4.00	0.75	5.92	27018.28	5.92	21.55	1171.80	21.55	43.16	70.84	43.16	301.40	372.020	373.117

Hydraflow Table of Contents

1286-Detention Basin4_Adam Study.gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 05 / 15 / 2019

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

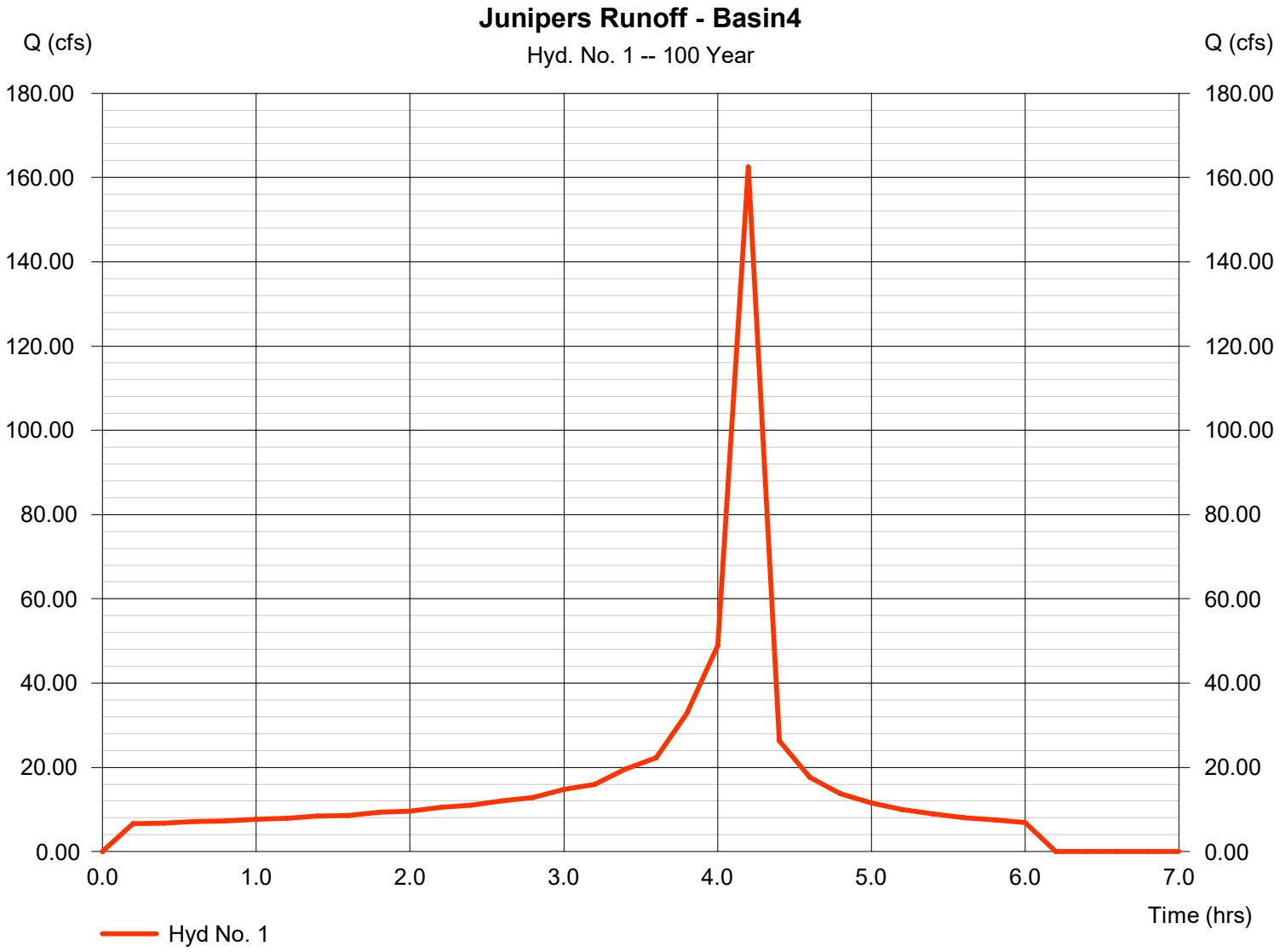
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	162.50	12	252	398,232	------	------	------	Junipers Runoff - Basin4
2	Reservoir	78.46	12	264	398,229	1	638.75	178,250	Junipers Deten Basin4

Hydrograph Report

Hyd. No. 1

Junipers Runoff - Basin4

Hydrograph type	= Manual	Peak discharge	= 162.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 12 min	Hyd. volume	= 398,232 cuft



Hydrograph Report

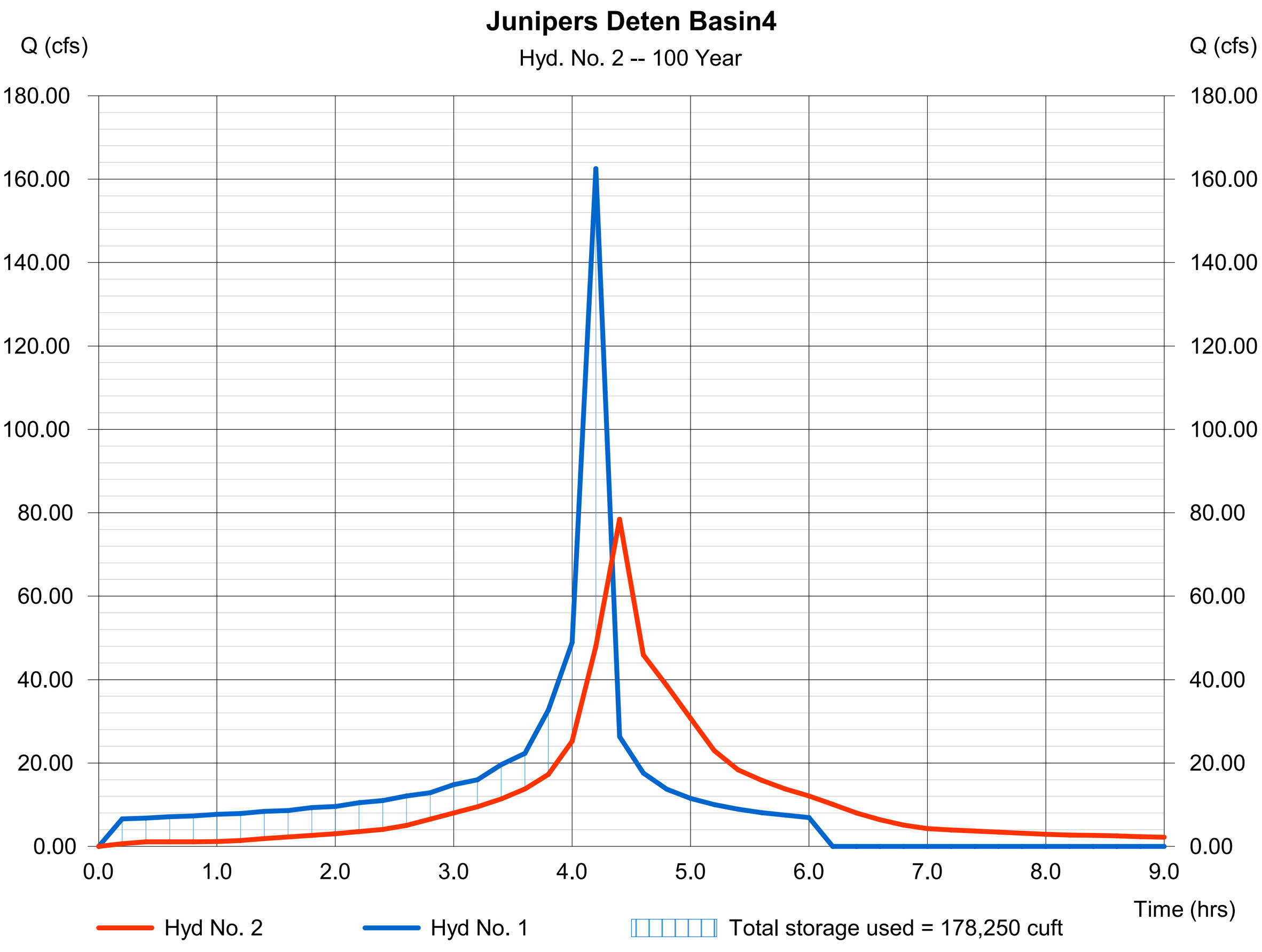
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 05 / 15 / 2019

Hyd. No. 2

Junipers Deten Basin4

Hydrograph type	=	Reservoir	Peak discharge	=	78.46 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.40 hrs
Time interval	=	12 min	Hyd. volume	=	398,229 cuft
Inflow hyd. No.	=	1 - Junipers Runoff - Basin4	Max. Elevation	=	638.75 ft
Reservoir name	=	Junipers Detention Basin3	Max. Storage	=	178,250 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Junipers Detention Basin3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 634.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	634.00	35,291	0	0
0.10	634.10	35,544	3,541	3,541
0.50	634.50	36,559	14,419	17,960
0.60	634.60	36,813	3,668	21,628
1.00	635.00	37,828	14,926	36,555
1.10	635.10	38,087	3,795	40,350
1.50	635.50	39,125	15,440	55,790
2.00	636.00	40,421	19,884	75,674
2.50	636.50	41,746	20,539	96,213
2.60	636.60	42,011	4,187	100,400
3.00	637.00	43,071	17,014	117,414
3.50	637.50	44,425	21,871	139,285
4.00	638.00	45,778	22,548	161,833
4.20	638.20	46,331	9,210	171,043
4.50	638.50	47,160	14,022	185,065
4.70	638.70	47,712	9,486	194,551
5.00	639.00	48,541	14,436	208,988
5.20	639.20	48,964	9,749	218,737
5.50	639.50	49,951	14,836	233,573
5.70	639.70	50,374	10,031	243,604
6.00	640.00	51,220	15,237	258,841

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	Inactive
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	634.00	---	---	---	---	---	---	---	---	---	---	0.000
0.10	3,541	634.10	---	---	---	---	---	---	---	---	---	1.097	1.097
0.50	17,960	634.50	---	---	---	---	---	---	---	---	---	1.098	1.098
0.60	21,628	634.60	---	---	---	---	---	---	---	---	---	1.209	1.209
1.00	36,555	635.00	---	---	---	---	---	---	---	---	---	2.577	2.577
1.10	40,350	635.10	---	---	---	---	---	---	---	---	---	2.784	2.784
1.50	55,790	635.50	---	---	---	---	---	---	---	---	---	4.408	4.408
2.00	75,674	636.00	---	---	---	---	---	---	---	---	---	10.68	10.68
2.50	96,213	636.50	---	---	---	---	---	---	---	---	---	18.98	18.98
2.60	100,400	636.60	---	---	---	---	---	---	---	---	---	21.43	21.43
3.00	117,414	637.00	---	---	---	---	---	---	---	---	---	32.80	32.80
3.50	139,285	637.50	---	---	---	---	---	---	---	---	---	42.67	42.67
4.00	161,833	638.00	---	---	---	---	---	---	---	---	---	49.97	49.97
4.20	171,043	638.20	---	---	---	---	---	---	---	---	---	62.11	62.11
4.50	185,065	638.50	---	---	---	---	---	---	---	---	---	93.92	93.92
4.70	194,551	638.70	---	---	---	---	---	---	---	---	---	120.97	120.97
5.00	208,988	639.00	---	---	---	---	---	---	---	---	---	168.42	168.42
5.20	218,737	639.20	---	---	---	---	---	---	---	---	---	204.03	204.03
5.50	233,573	639.50	---	---	---	---	---	---	---	---	---	262.74	262.74
5.70	243,604	639.70	---	---	---	---	---	---	---	---	---	305.11	305.11
6.00	258,841	640.00	---	---	---	---	---	---	---	---	---	373.12	373.12

Appendix 3 - Soils Information

Hydrologic Soil Group—San Diego County Area, California
(The Junipers)



Map Scale: 1:8,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DaC	Diablo clay, 2 to 9 percent slopes	D	60.4	51.5%
DaD	Diablo clay, 9 to 15 percent slopes, warm MAAT, MLRA 20	C	31.5	26.8%
DaE	Diablo clay, 15 to 30 percent slopes	D	9.0	7.6%
EsC	Escondido very fine sandy loam, 5 to 9 percent slopes	C	10.1	8.6%
ExE	Exchequer rocky silt loam, 9 to 30 percent slopes	D	6.1	5.2%
LsE	Linne clay loam, 9 to 30 percent slopes	C	0.3	0.2%
Totals for Area of Interest			**117.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher