

The Junipers Project  
Final Environmental Impact Report  
SCH No. 2018041032 - Project No. 586670

Appendix G1

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Drainage Study

January 2021

# JUNIPERS DRAINAGE STUDY

City of San Diego, CA

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Preparation/Revision Date:  
May 16, 2019  
August 20, 2019



  
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\_\_\_\_\_  
Date



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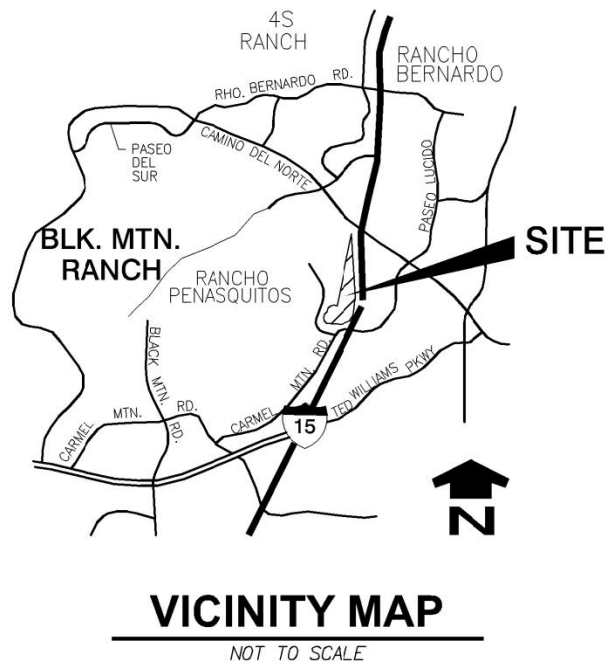
Appendix 3 – Soils Information

# 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.



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:

$$Q = C I A$$

$$I = 7.44P_6T_c^{-0.645}$$

$$T_c = T_t + T_i$$

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

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<sub>6</sub> = 6-hour precipitation (in). This value was taken from the 6-hour isopluvial maps found in Appendix B of the SDCHM.

T<sub>i</sub> = Initial time of concentration, from Table 3-2 of the SDCHM.

T<sub>t</sub> = 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 is 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

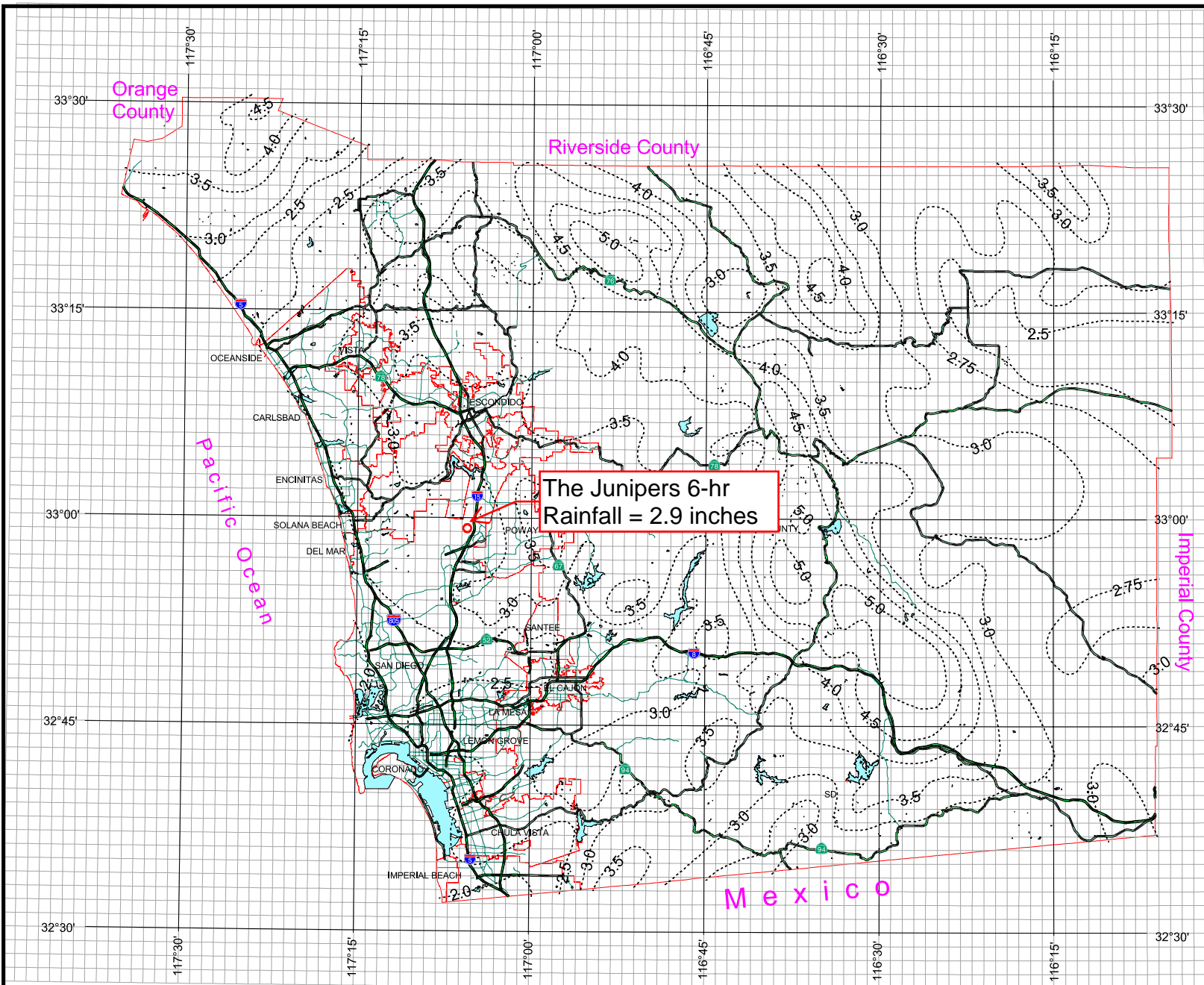
# County of San Diego Hydrology Manual



## Rainfall Isopluvials

### 100 Year Rainfall Event - 6 Hours

----- Isopluvial (inches)



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Department of Public Works  
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3 0 3 Miles

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## **RUNOFF COEFFICIENTS**

**Table 3-1  
RUNOFF COEFFICIENTS FOR URBAN AREAS**

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

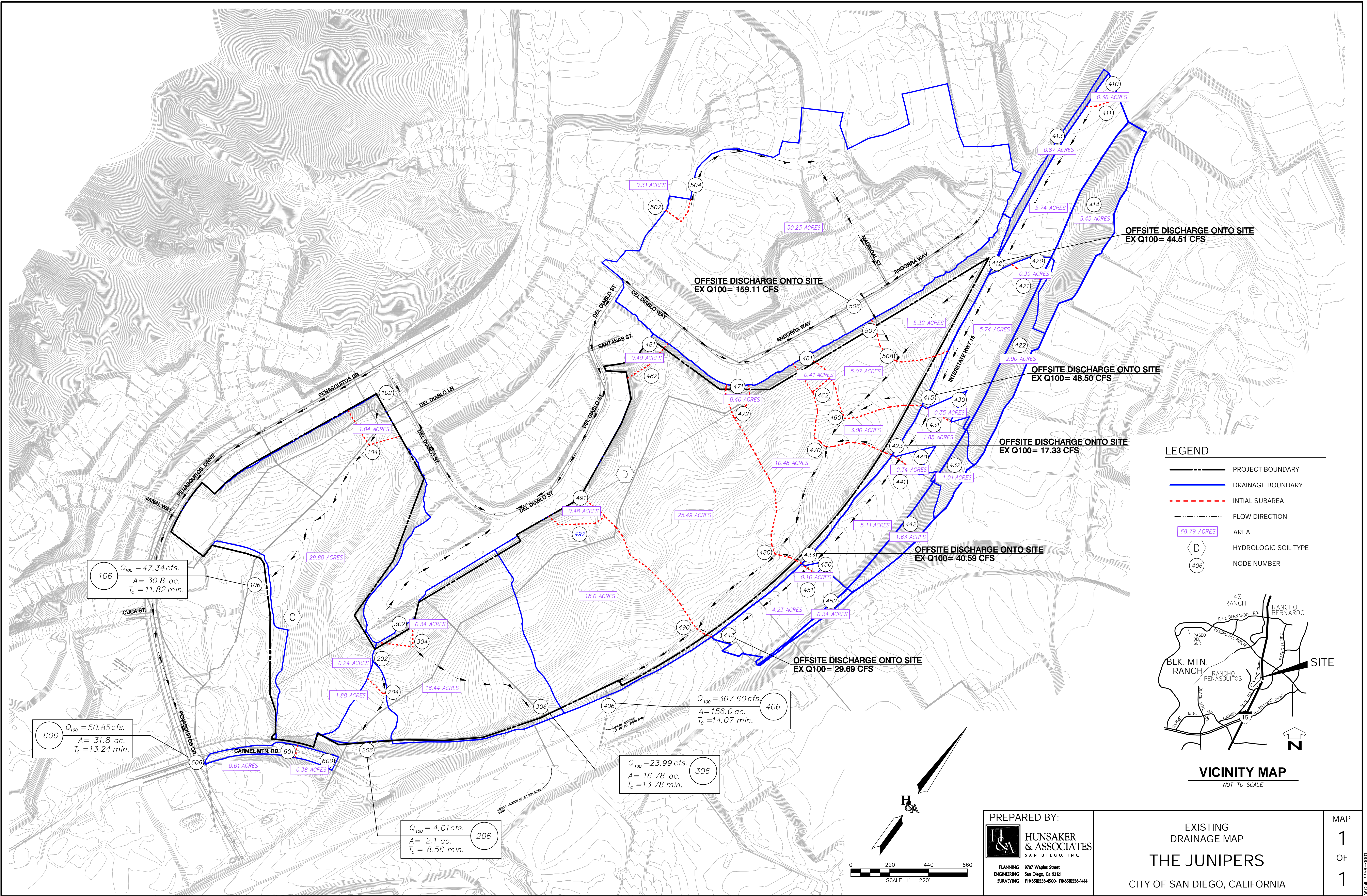
\*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient,  $C_p$ , for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the 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**





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EXISTING  
DRAINAGE MAP  
**THE JUNIPERS**  
CITY OF SAN DIEGO, CALIFORNIA

MAP  
1  
OF  
1



**100 YEAR EXISTING 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 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

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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(curbs-to-curbs) = 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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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

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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

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```

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 <<<<
=====
*****

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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(curbs-to-curbs) = 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

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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

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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)<<<<<

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=====
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(curbs-to-curbs) = 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<<<<
=====

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

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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

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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(curbs-to-curbs) = 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

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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

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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

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-----
>>>>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(curbs-to-curbs) = 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
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>>>>>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/HR)  (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/HR)
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!

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

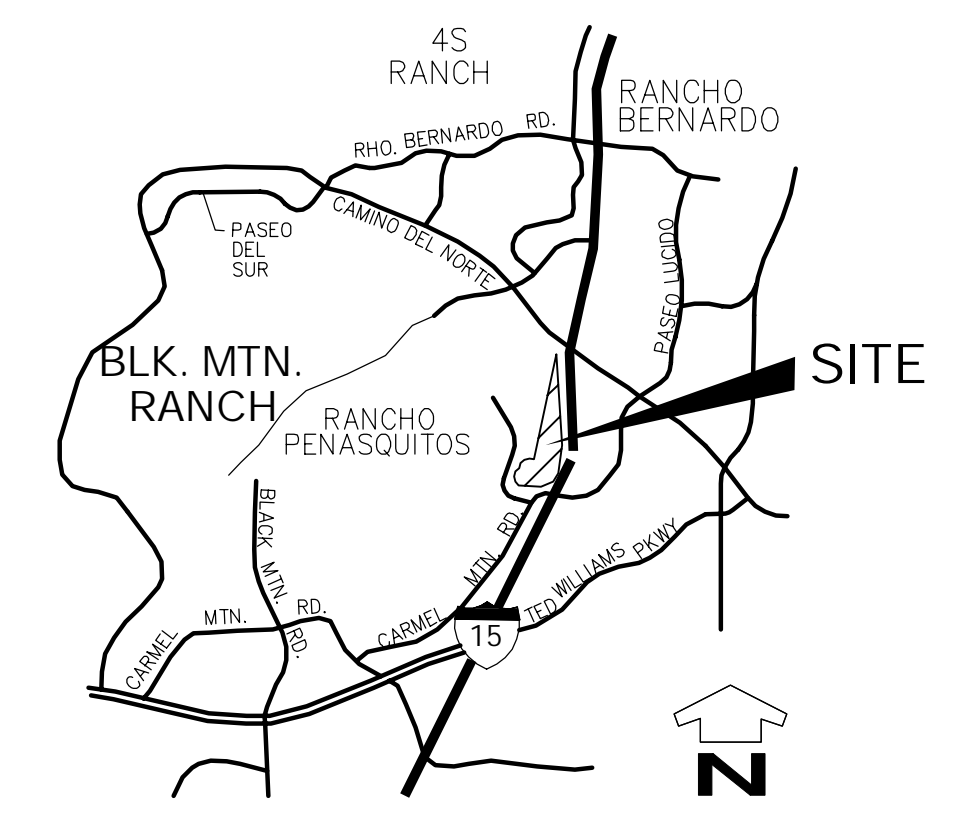
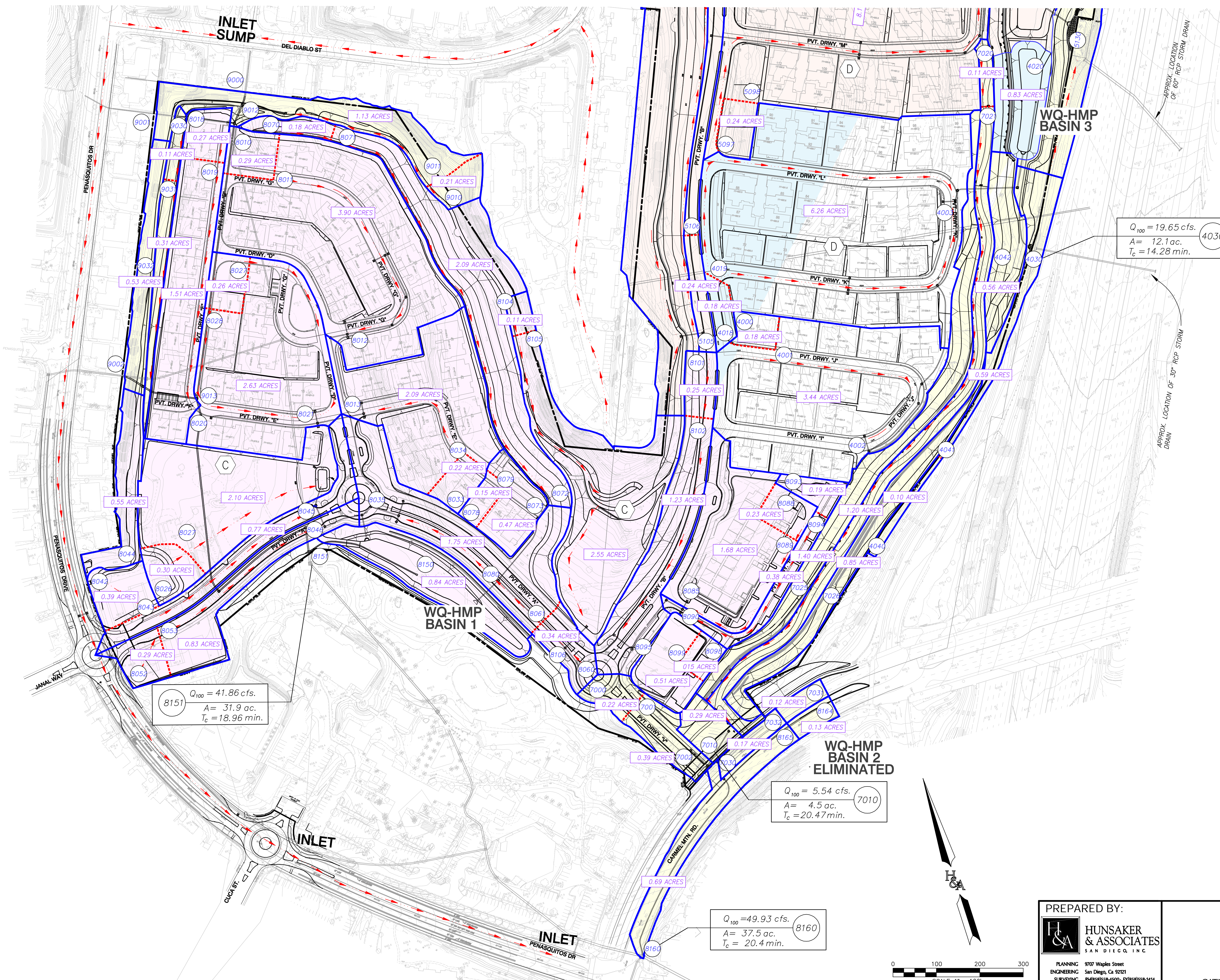
** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 294.65 9.27 5.131
2 367.60 14.07 3.920

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

```

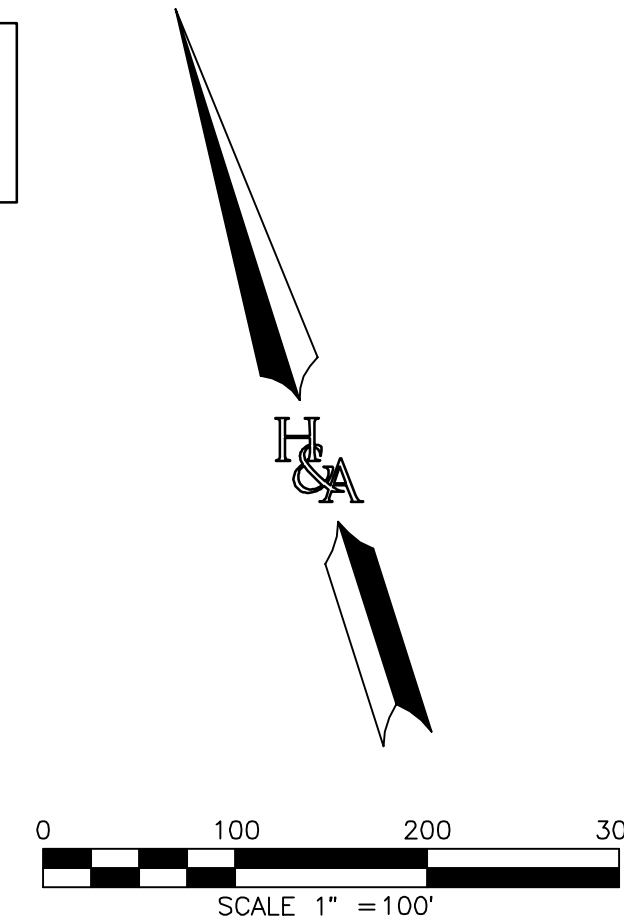
## **DEVELOPED CONDITIONS**





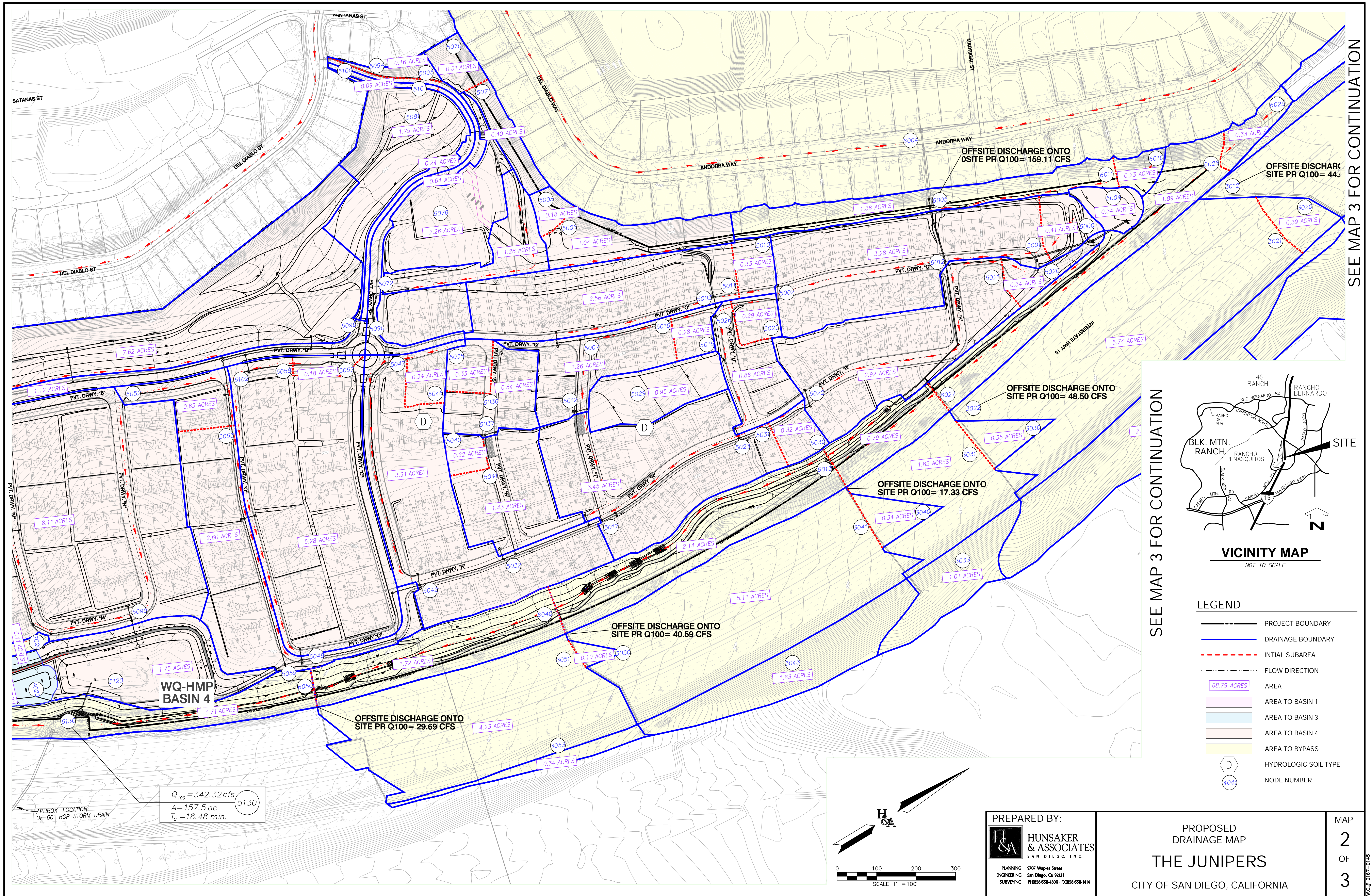
VICINITY MAP  
NOT TO SCALE

- LEGEND**
- PROJECT BOUNDARY
  - DRAINAGE BOUNDARY
  - INITIAL SUBAREA
  - FLOW DIRECTION
  - 68.79 ACRES
  - AREA TO BASIN 1
  - AREA TO BASIN 3
  - AREA TO BASIN 4
  - AREA TO BYPASS
  - HYDROLOGIC SOIL TYPE
  - NODE NUMBER



PREPARED BY: HUNSAKER & ASSOCIATES SAN DIEGO, INC. PLANNING: 9707 Waples Street ENGINEERING: San Diego, CA 92121 SURVEYING: PH(619)558-4500 • FX(619)558-1414	PROPOSED DRAINAGE MAP <b>THE JUNIPERS</b> CITY OF SAN DIEGO, CALIFORNIA		MAP <b>1</b> OF <b>2</b>



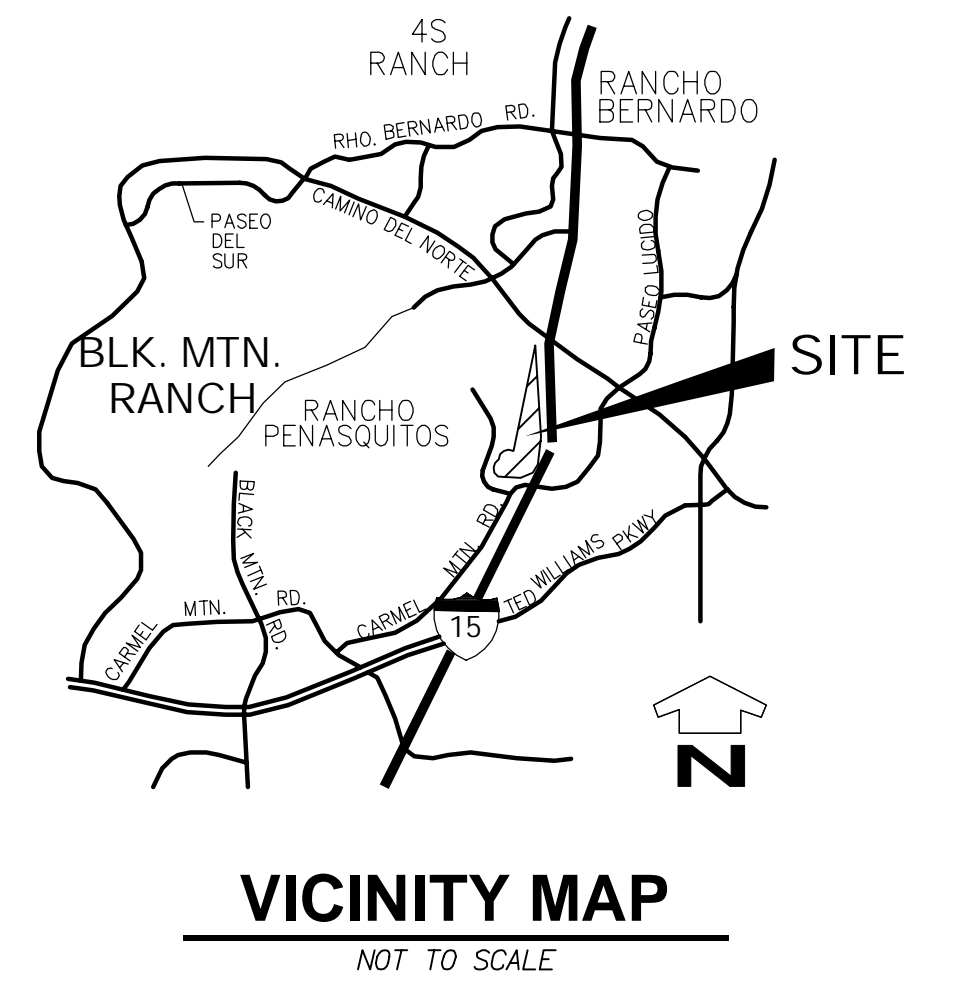
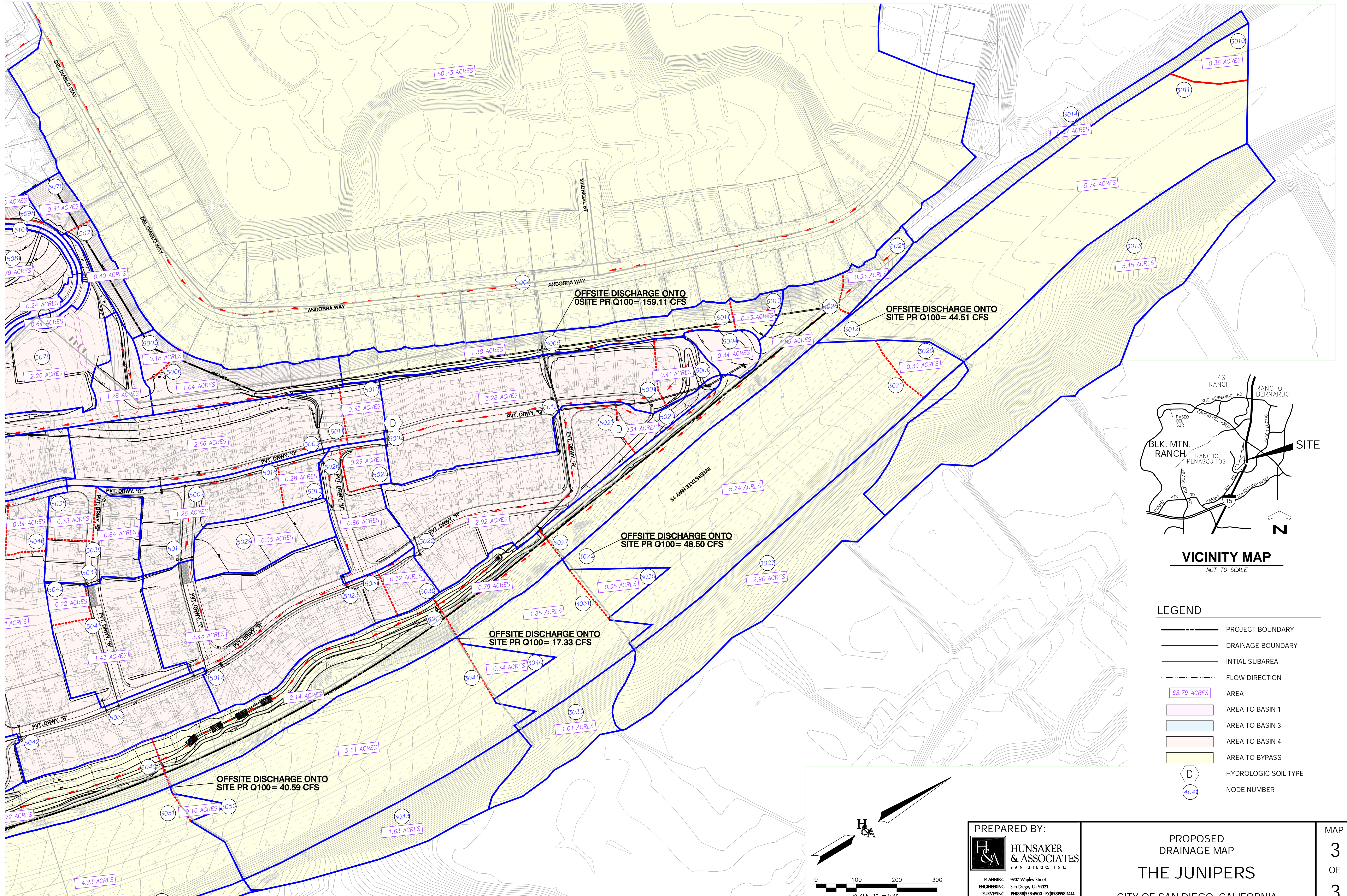


SEE MAP 3 FOR CONTINUATION

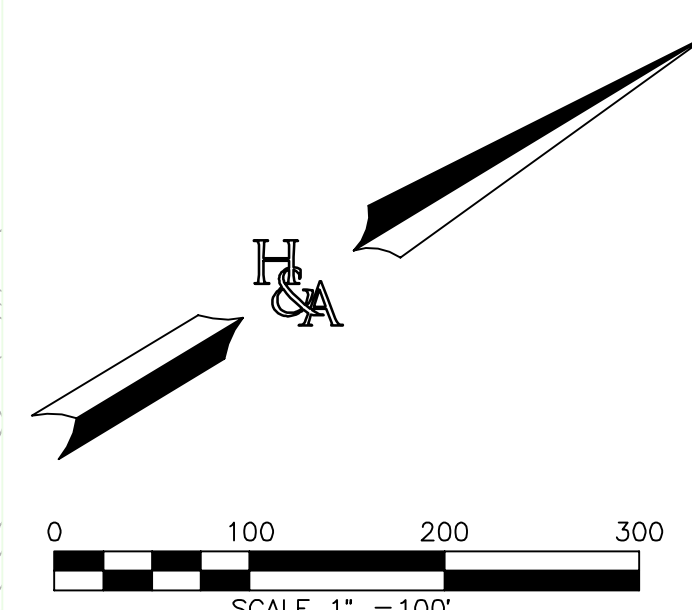
SEE MAP 3 FOR CONTINUATION



SEE MAP 2 FOR CONTINUATION



LEGEND	
	PROJECT BOUNDARY
	DRAINAGE BOUNDARY
	INITIAL SUBAREA
	FLOW DIRECTION
	AREA
	AREA TO BASIN 1
	AREA TO BASIN 3
	AREA TO BASIN 4
	AREA TO BYPASS
	HYDROLOGIC SOIL TYPE
	NODE NUMBER



PREPARED BY: <b>HUNSAKER &amp; ASSOCIATES</b> SAN DIEGO, INC.		PROPOSED DRAINAGE MAP  <b>THE JUNIPERS</b>  CITY OF SAN DIEGO, CALIFORNIA	MAP 3 OF 3
PLANNING	9707 Waples Street San Diego, Ca 92121		
ENGINEERING SURVEYING	PH(619)558-4500 • FX(619)558-1414		



**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

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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 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.

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*****
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/HR) (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/HR)
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

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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

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*****
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(curbs-to-curbs) =   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.

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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

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*****
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

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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/HR)    (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/HR)
    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

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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(curbs-to-curbs) =  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

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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/HR) (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/HR)
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/HR) = 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:

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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(curbs-to-curbs) = 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):

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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/HR) (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/HR)
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/HR) = 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 <<<<
=====

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*****
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(curbs-to-curbs) =   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<<<<

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```

=====
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

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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

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-----
>>>>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

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** CONFLUENCE DATA **
STREAM      RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)      (MIN.)      (INCH/HR)      (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/HR)
    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
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>>>>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(curbs-to-curbs) = 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

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-----
>>>>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(curbs-to-curbs) = 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

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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

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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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(curbs-to-curbs) =    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/HR)  (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/HR)  (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/HR)
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

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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(curbs-to-curbs) = 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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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(curbs-to-curbs) = 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(FT/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(FT/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

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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(curbs-to-curbs) = 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)<<<<

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=====
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

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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(curbs-to-curbs) =    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

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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/HR)    (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/HR)
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
-----

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 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(curbs-to-curbs) = 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<<<<
=====

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```

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

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-----
>>>>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(curbs-to-curbs) = 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/HR)    (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/HR)
   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/HR)    (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/HR)    (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/HR)

```

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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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(curbs-to-curbs) =  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

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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(curbs-to-curbs) = 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

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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

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*****
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

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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

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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(curbs-to-curbs) = 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(FT/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(FT/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(FT/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<<<<
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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

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*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)

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      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(curbs-to-curbs) = 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

```

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*****
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(curbs-to-curbs) = 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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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(curbs-to-curbs) = 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



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    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)<<<<

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=====
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(curbs-to-curbs) = 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<<<<

```

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>>>>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

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*****
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(curbs-to-curbs) =    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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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

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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(curbs-to-curbs) = 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

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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

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-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 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(curbs-to-curbs) = 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.

*****

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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/HR)    (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/HR)
    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/HR)    (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/HR)    (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/HR)
    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)<<<<
```

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=====
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

*****

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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(curbs-to-curbs) =  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.

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*****
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(curbs-to-curbs) = 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

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*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

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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(curbs-to-curbs) = 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(FT/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(FT/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(FT) = 679.00 DOWNSTREAM(FT) = 674.00
FLOW LENGTH(FT) = 178.00 MANNING'S N = 0.013

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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(curbs-to-curbs) = 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:

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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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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/HR)    (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/HR)    (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/HR)
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/HR)    (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/HR)    (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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/HR)      (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/HR)
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/HR) = 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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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(curbs-to-curbs) = 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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (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 NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (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  
=====

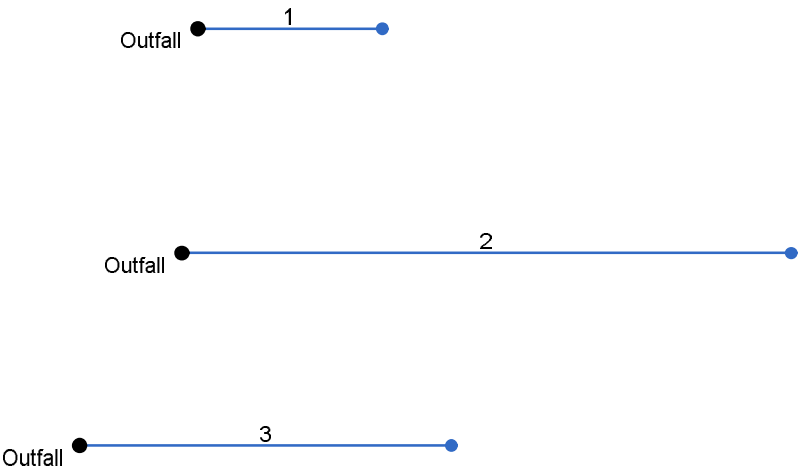
END OF RATIONAL METHOD ANALYSIS



## **Appendix 2 – Hydraulic Calculations**



# Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



# 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)**

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)	Qtot-orif (cfs)	Qtot-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



**Watershed Model Schematic..... 1**

**100 - Year**

**Hydrograph Reports..... 2**

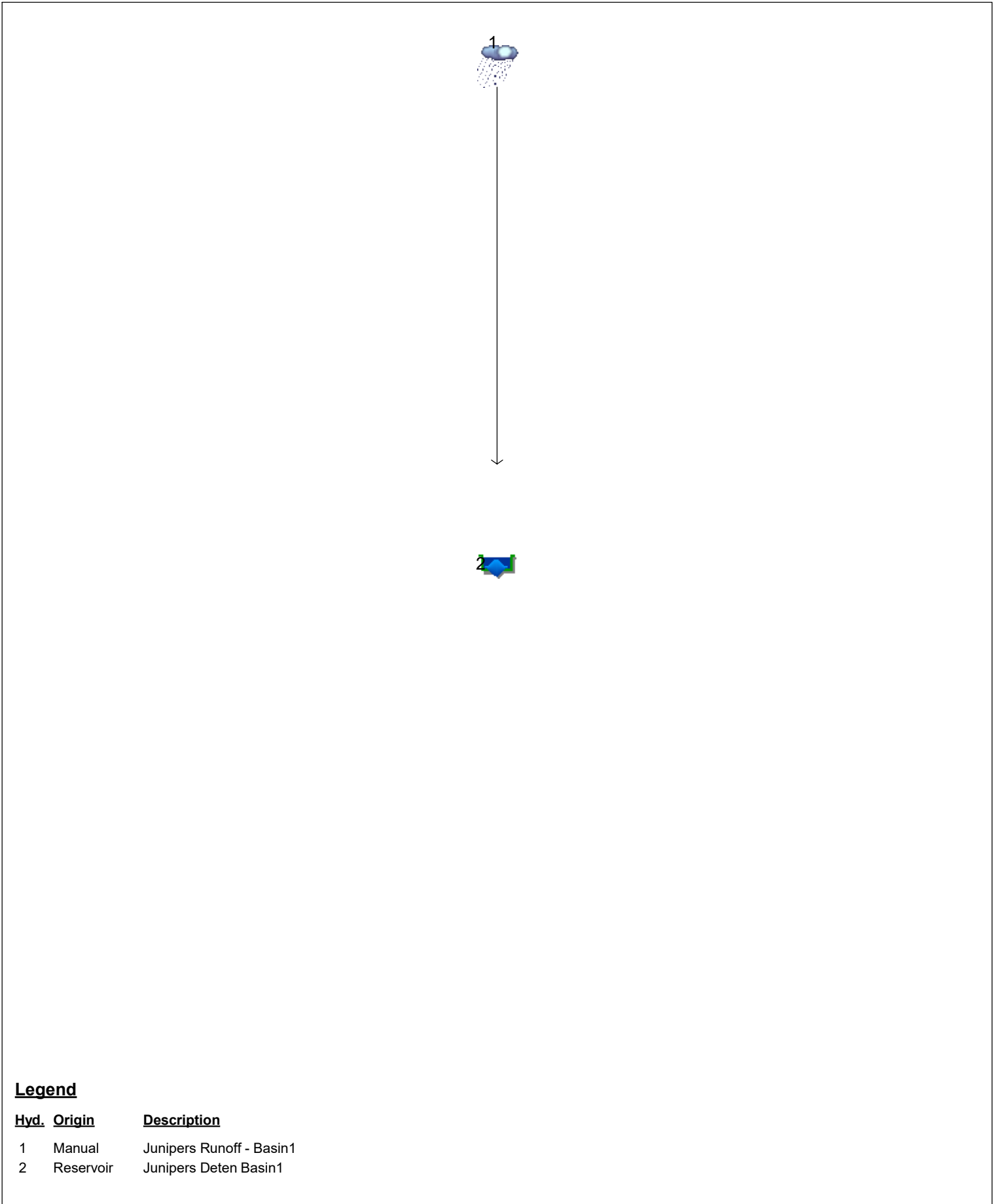
        Hydrograph No. 1, Manual, Junipers Runoff - Basin1..... 2

        Hydrograph No. 2, Reservoir, Junipers Deten Basin1..... 3

        Pond Report - Junipers Detention Basin1..... 4

# 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

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

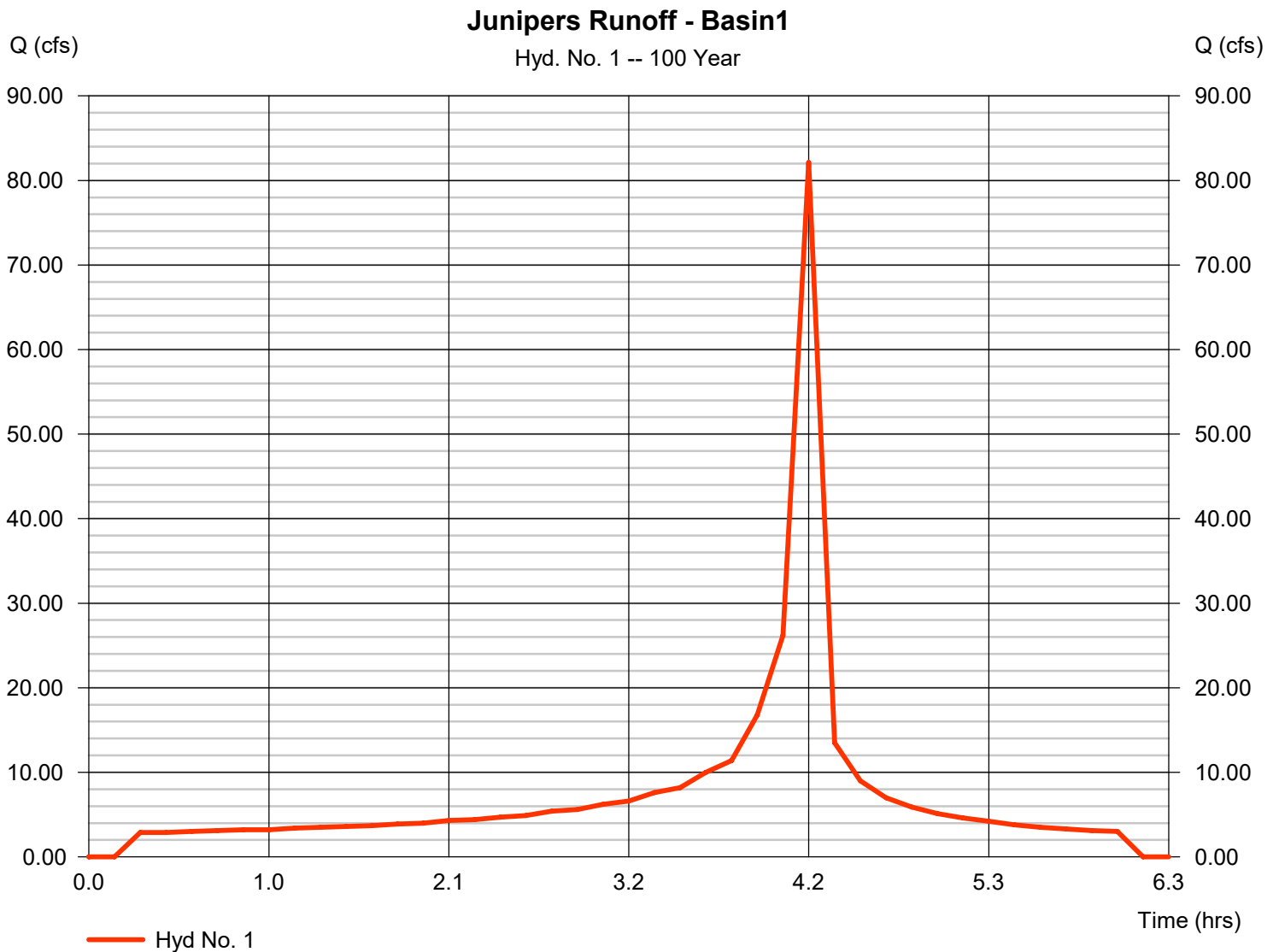
Wednesday, 05 / 1 / 2019

## Hyd. No. 1

### Junipers Runoff - Basin1

Hydrograph type = Manual  
 Storm frequency = 100 yrs  
 Time interval = 9 min

Peak discharge = 82.12 cfs  
 Time to peak = 4.20 hrs  
 Hyd. volume = 167,843 cuft



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

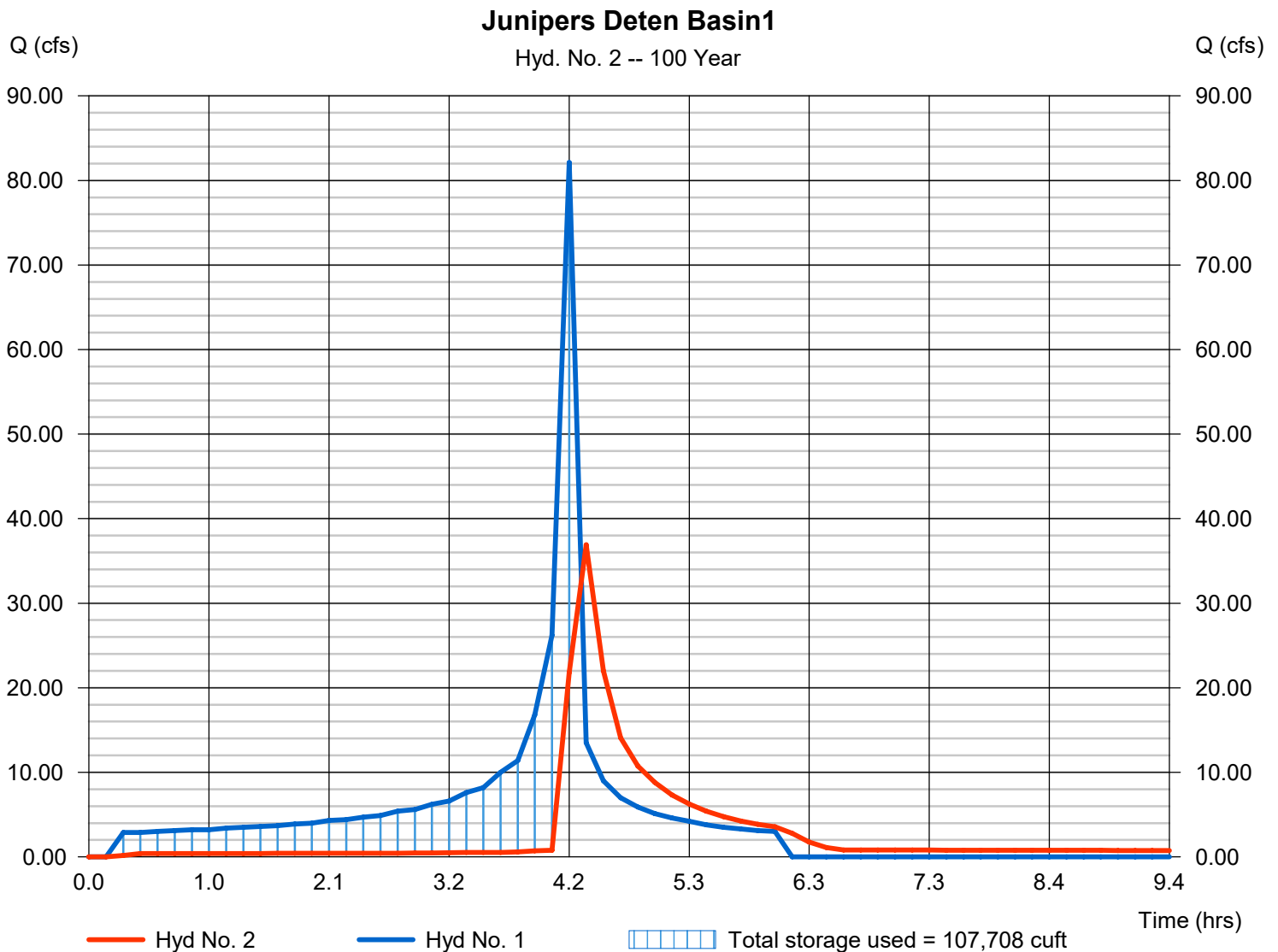
Wednesday, 05 / 1 / 2019

## 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.





## **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 (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)
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

**Watershed Model Schematic..... 1**

**100 - Year**

**Summary Report..... 2**

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Hydrograph No. 1, Manual, Junipers Runoff - Basin2..... 3

Hydrograph No. 2, Reservoir, Junipers Deten Basin3..... 4

Pond Report - Junipers Detention Basin2..... 5

# Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



**Legend**

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
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

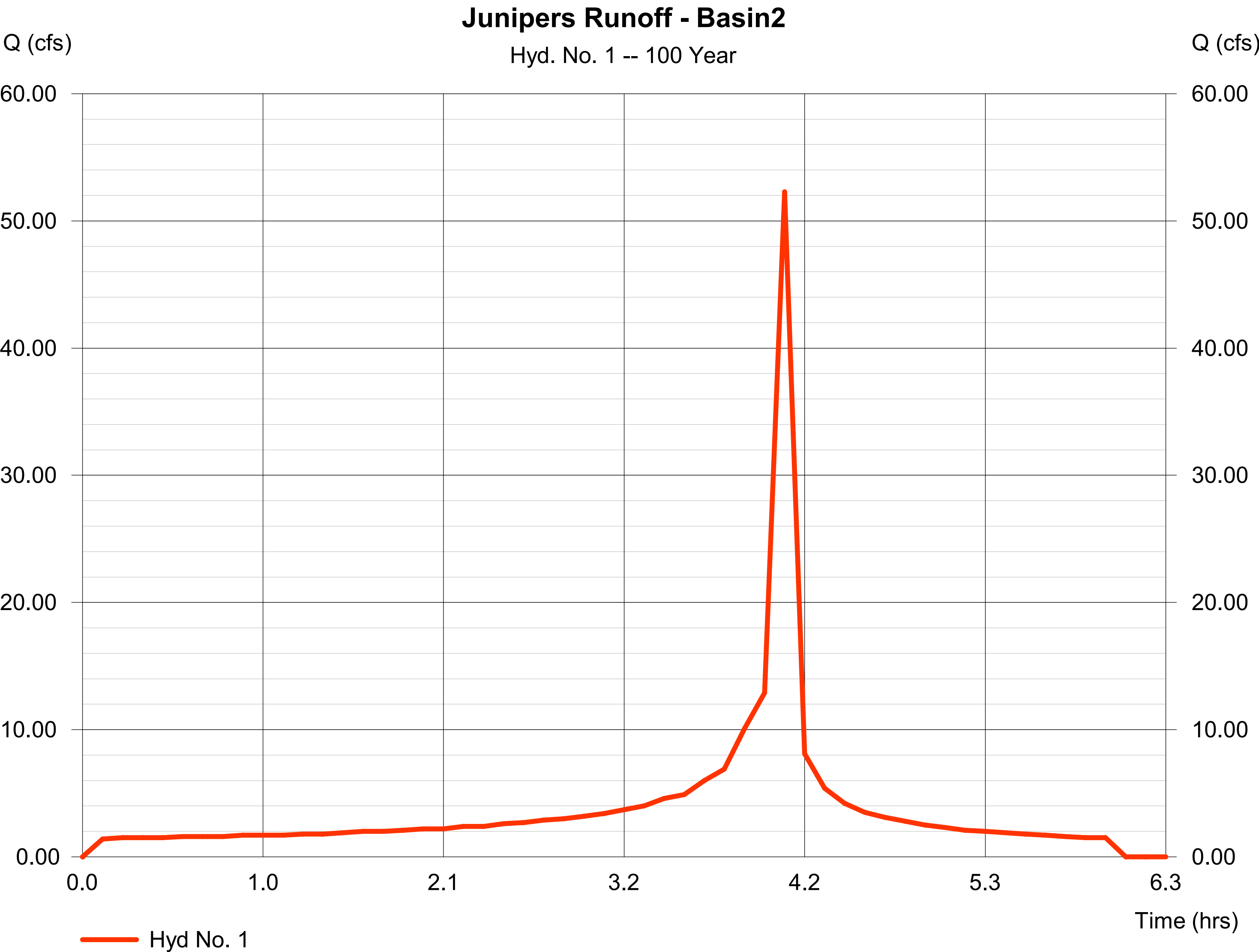
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	52.29	7	245	86,432	-----	-----	-----	Junipers Runoff - Basin2
2	Reservoir	17.95	7	252	82,041	1	670.00	44,259	Junipers Deten Basin3
1286-Detention Basin3_Study.gpw					Return Period: 100 Year			Thursday, 12 / 6 / 2018	

# 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



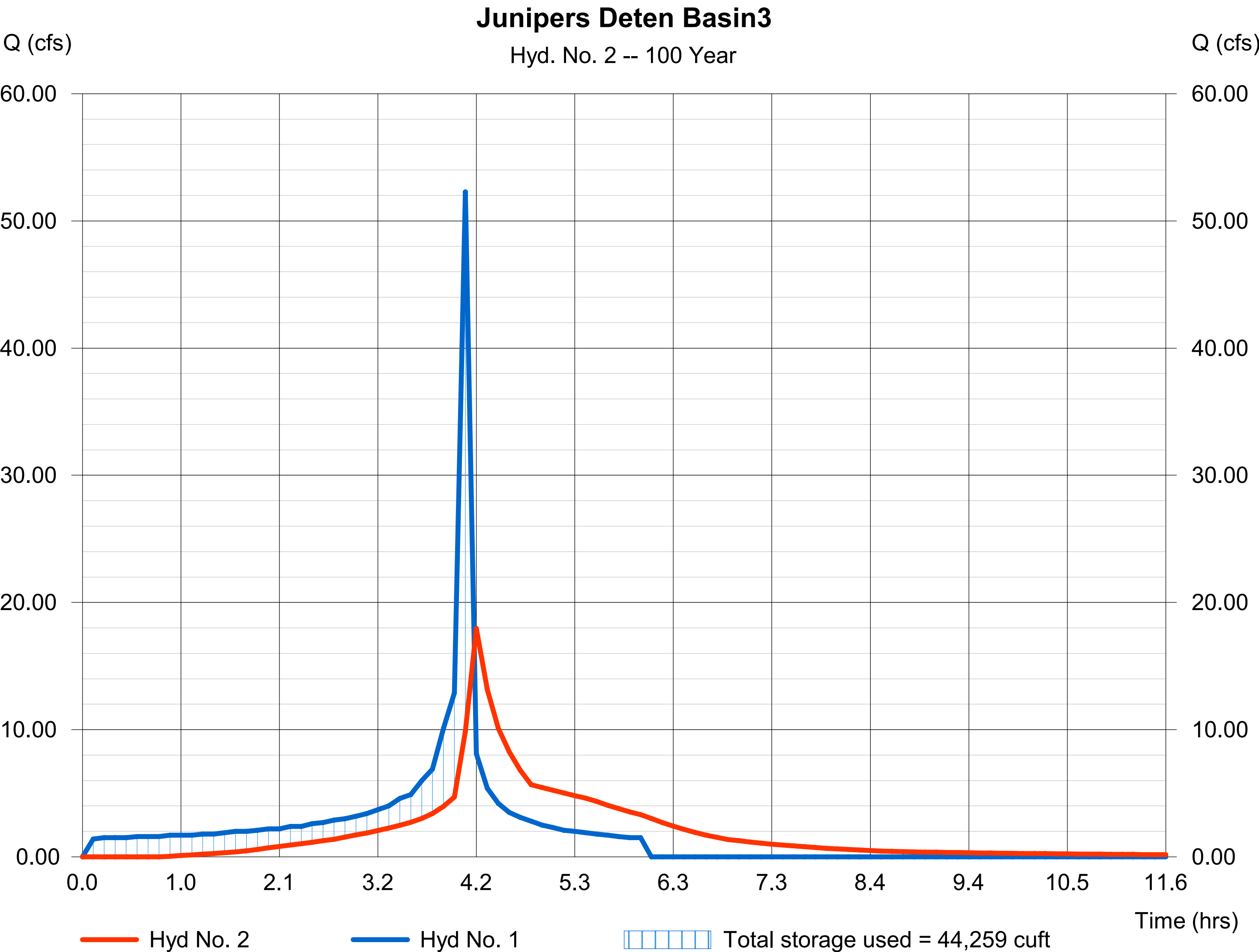
# Hydrograph Report

## 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.



[illegible]

## **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					

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

100 - Year

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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

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

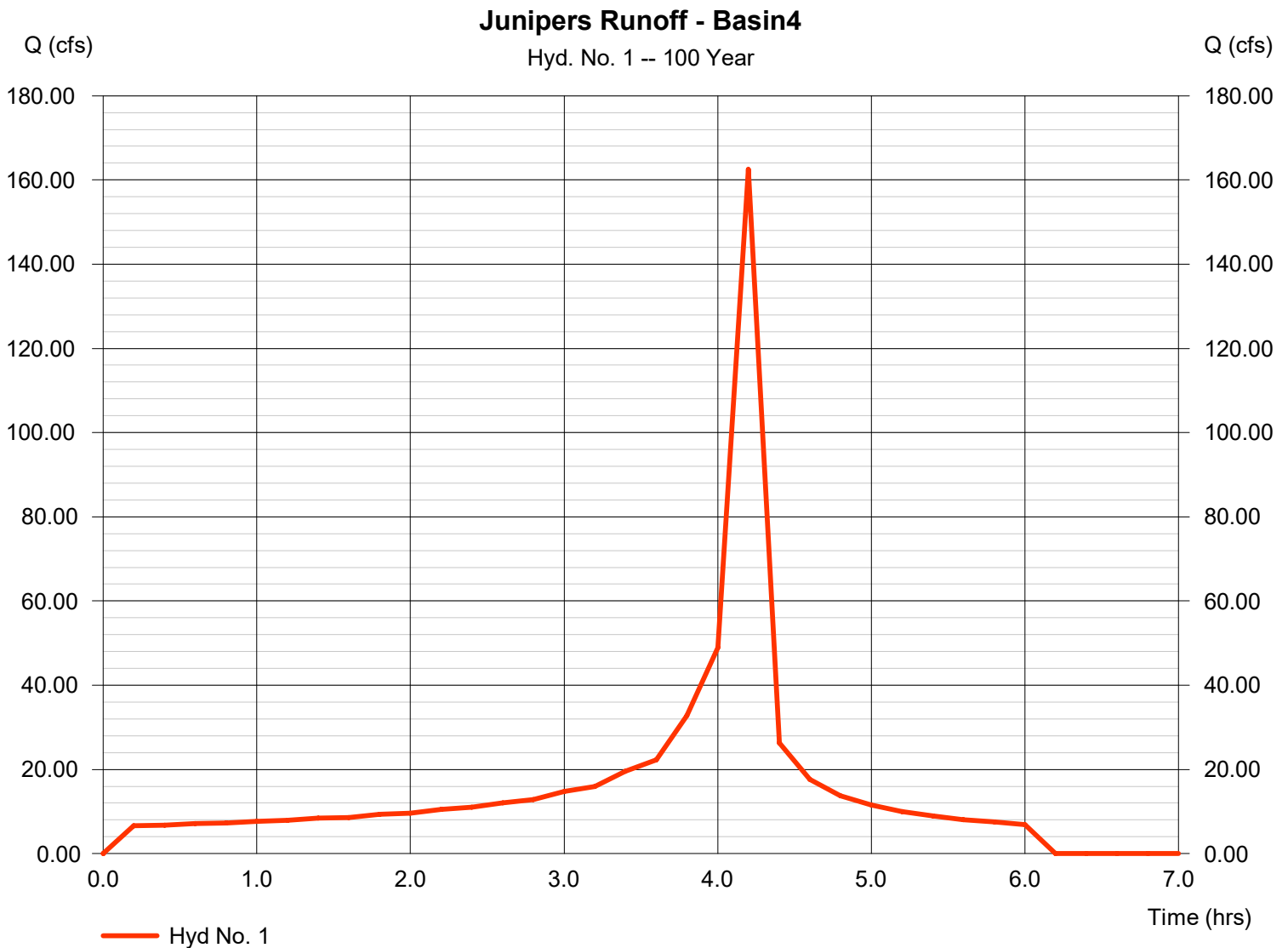
Wednesday, 05 / 15 / 2019

## Hyd. No. 1

### Junipers Runoff - Basin4

Hydrograph type = Manual  
Storm frequency = 100 yrs  
Time interval = 12 min

Peak discharge = 162.50 cfs  
Time to peak = 4.20 hrs  
Hyd. volume = 398,232 cuft



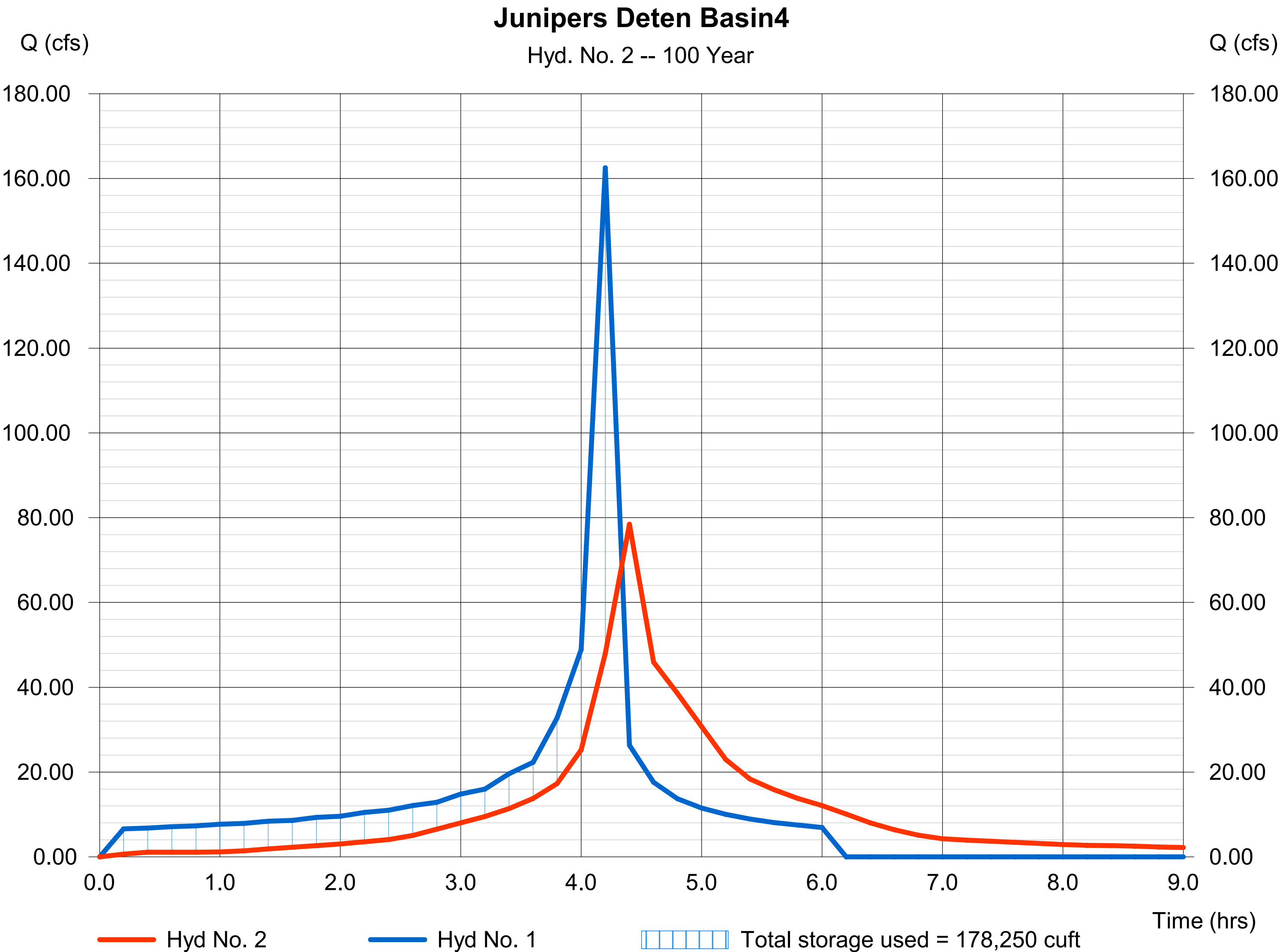
# Hydrograph Report

## 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.








## **Appendix 3 - Soils Information**

# Hydrologic Soil Group—San Diego County Area, California (The Junipers)



## 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%
<b>Totals for Area of Interest</b>			<b>117.4</b>	<b>100.0%</b>



## 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