Appendix F

Drainage Study

DRAINAGE STUDY
for
THE FARM AT POWAY

Assessor's Parcel Number
213-110-07-00, 08 & 18

1716 Stone Ridge Country Club Ln,
Poway, CA 92064

Prepared for:

SMA VENTURES
12919 Corte Juana
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Prepared by:

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January 16th, 2020



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Appendix 3 – Hydraulic calculations for Proposed Basin/Outlet Structures

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NOTE: Hydraulic Calculations for the proposed storm drain network will be provided during Final Engineering.

1 Scope

The purpose of this study is to provide hydrologic and hydraulic calculations in support of The Farms – a proposed development that will create single family residential units on a 117-acre site in the City of Poway, California. This report will quantify proposed runoff for the 100-year frequency storm event for the proposed development and existing site. 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 Farm”.

2 Existing Conditions

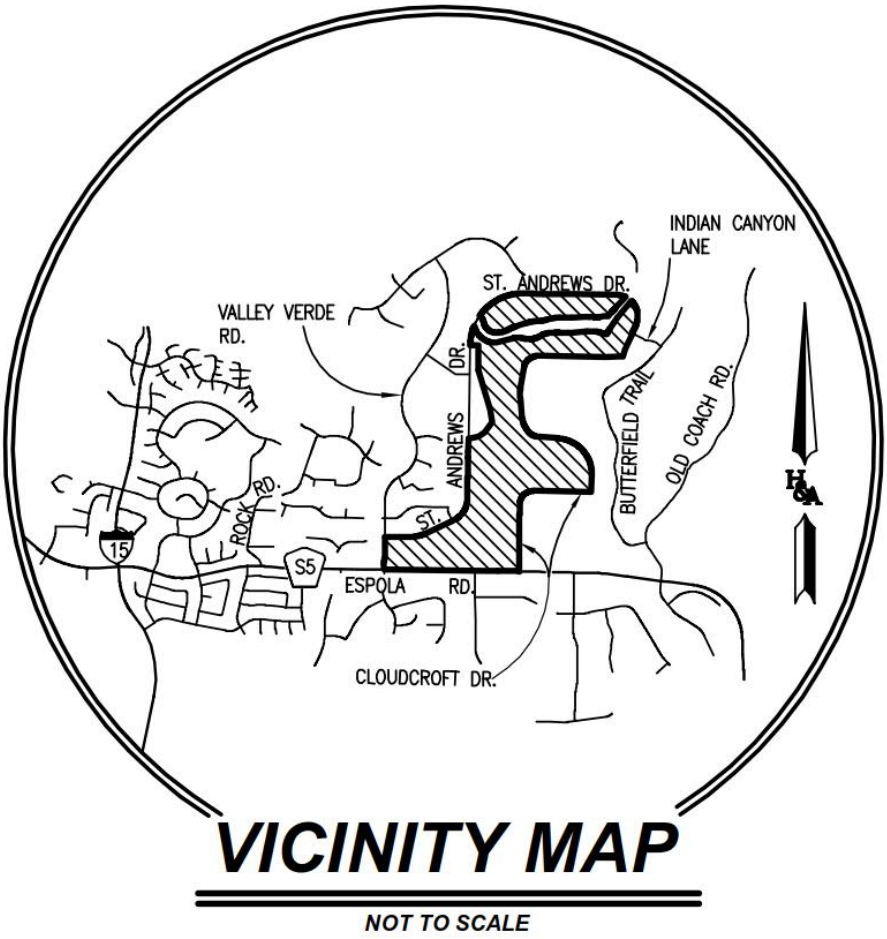
The project site is currently the Stoneridge Country Club that includes a golf course with water features and vegetated areas, tennis courts, and a club house.

Stoneridge Golf has 3 total concrete brow ditches that convey onsite and offsite flow to two separate outflow locations – one to the north and one to the south.

An existing brow ditch conveys offsite flows from St. Andrews Drive and flows from the southern portion of the stone ridge golf course south through the site discharging into a triple arch culvert beneath Espola Road.

Additionally, flows from Tom O’shanter Drive and Cloudcroft Court also are conveyed through the site southerly and are discharged into the same triple arch culvert beneath Espola Road as described above.

In the northern portion of the site, flows from Boca Raton Lane flow into a brow ditch and are routed to a pipe that conveys the flow underneath Valle De Lobo Dr & Villamoura Dr, eventually discharging into the open space north of Glen Arven Lane. The surrounding northern area on-site also discharges into the same outfall.



3 Proposed Development

All existing structures will be replaced and (160) single family developed lots with homes, roads, and associated landscape areas will be developed. The project proposes the construction of an internal storm drain system.

All onsite runoff from the residential areas will be collected and routed to one of the six-biofiltration basins that will detain and attenuate 100-year peak flows per City of Poway design standards.

Flow generated from onsite agricultural areas during the 100-year event will be conveyed to one of three outfall locations via storm drain.

Treatment of storm water runoff from the site is addressed in a separate report - the “Priority Development Project Storm Water Quality Management Plan for The Farm” prepared by Hunsaker & Associates San Diego Inc.

4 Methodology

4.1 Hydrology

Rational Method Hydrologic Analysis

Computer Software Package – AES-2015

Design Storm - 100-year return interval

Land Use – Multi-family residential onsite;

Soil Type – Hydrologic soil group C was assumed for all areas. 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.

Runoff Coefficient - In accordance with the County of San Diego standards, runoff coefficients were based on land use and slope.

Rainfall Intensity - Initial time of concentration values were determined using the County of San Diego standards. The rainfall intensity-duration-frequency curve for the San Diego County was used to determine rainfall intensities.

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

Q = CIA, where:

- Q = The peak runoff rate in cubic feet per second at the point of analysis.
- C = A runoff coefficient representing the area - averaged ratio of runoff to rainfall intensity.
- I = The time-averaged rainfall intensity in inches per hour corresponding to the time of concentration.
- A = The drainage basin area in acres.

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

The procedure for the subarea summation model is as follows:

(1) Subdivide the watershed into an initial subarea (generally 1 lot) and subsequent subareas, which are generally less than 10 acres in size. Assign upstream and downstream node numbers to each subarea.

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

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

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

The nodes are joined together by links, which may be street gutter flows, drainage swales, drainage ditches, pipe flow, or various channel flows. The AES-2003 computer subarea menu is as follows:

SUBAREA HYDROLOGIC PROCESS

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

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

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

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

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

(i). The most frequent case is where the collection stream with the longer time of concentration has the larger Q. The smaller Q value is adjusted by the ratio of rainfall intensities.

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

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

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

5 Results

Per the San Diego County isopluvial maps, the rainfall depth for the 100 – year flow event is 3.3 inches. Refer to the isopluvial map included in Appendix 2.

Table 1 - Summary of Rational Method Hydrologic Analysis

	Existing Condition		Proposed Condition	
Node	Area (ac)	100-Year Peak Flow (cfs)	Area (ac)	100-Year Peak Flow (cfs)
100	159.9	258.11	159.7	243.1* (306.47)**
300	91.2	177.11	90.8	174.95* (200.69)**
400	5.4	9.05	5.7	7.13* (25.53)**
Totals	256.5	-	256.2	-

*Post Mitigated (attenuated) Flow
** Post-condition (unattenuated) Flow

As illustrated by the Table 1, the attenuation provided by each of the six proposed basins reduces flow at each of the outfalls when compared to the existing condition.

Conclusions;

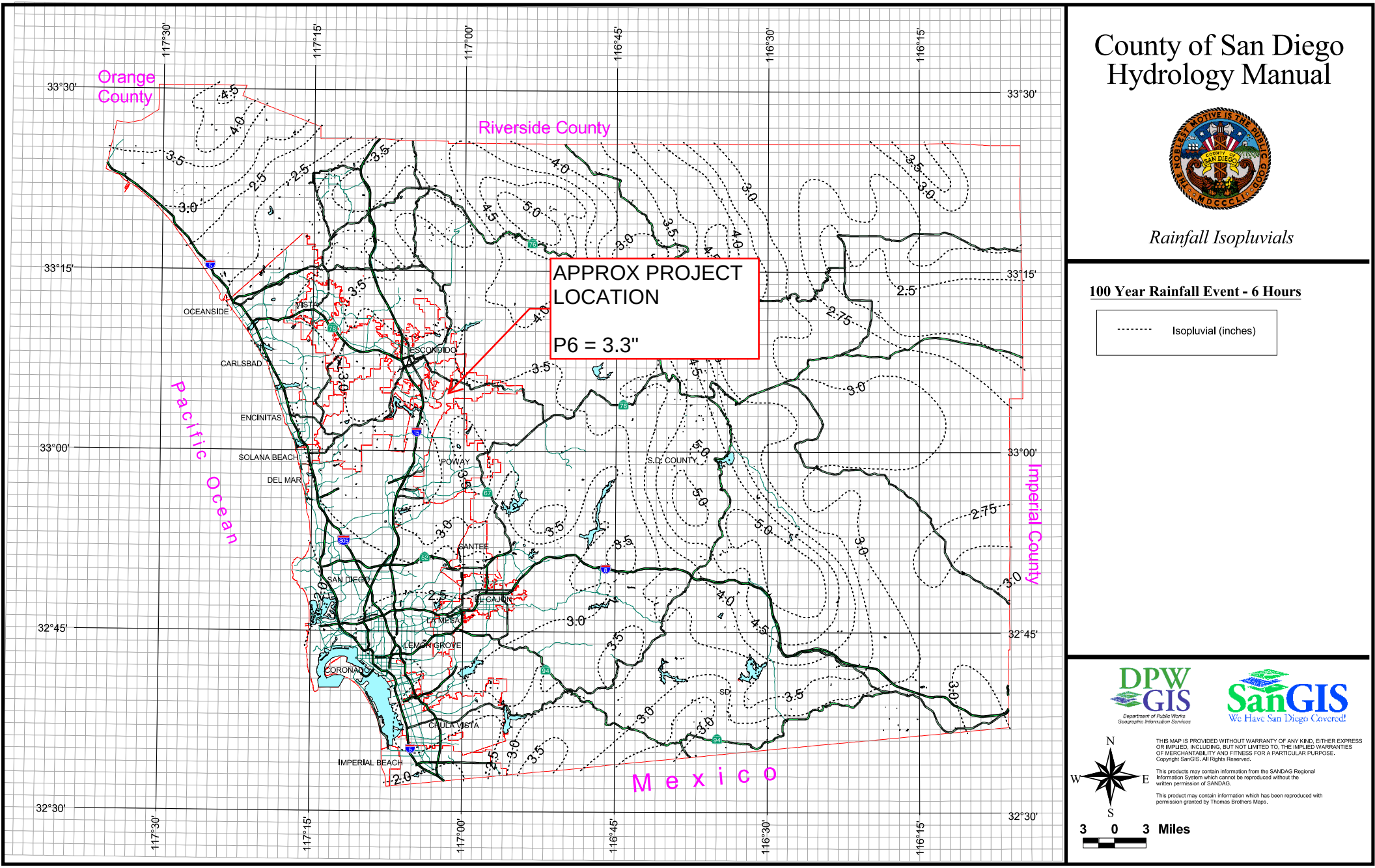
The project does not increase runoff in the 100-year storm event because of the onsite flood attenuation.

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

6 Appendices

Appendix 1 – Hydrology Calculations and Exhibits

Rainfall DATA



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

DPW GIS
Department of Public Works
Geographic Information Services

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3 0 3 Miles

RUNOFF COEFFICIENTS

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

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

EXISTING & PROPOSED CONDITION ONSITE

EXISTING & PROPOSED CONDITION OFFSITE (BYPASS)

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

EXISTING CONDITION

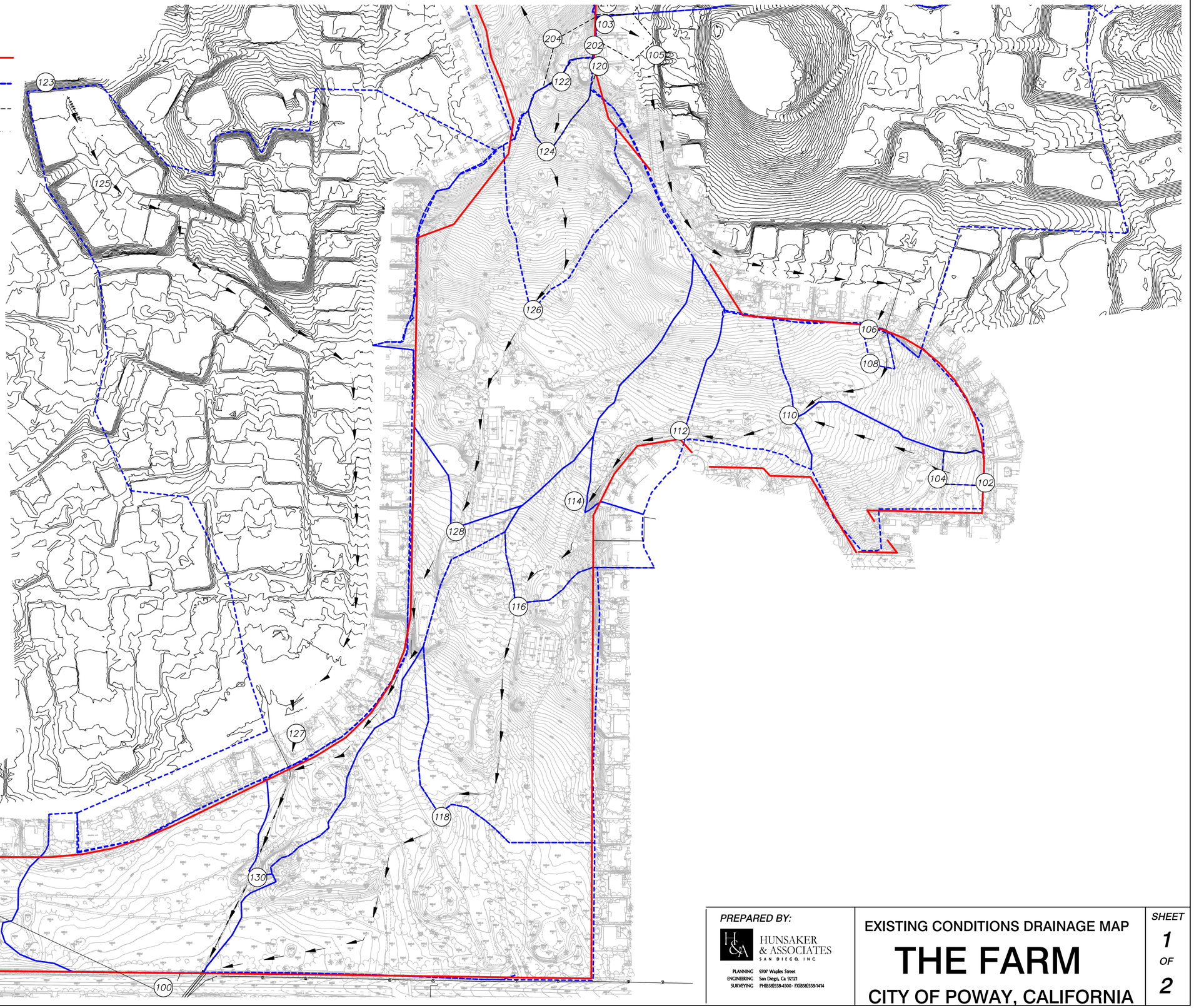
LEGEND

PROJECT BOUNDARY

WATERSHED BOUNDARY

WATERSHED SUB-BOUNDARY

FLOWLINE



H&A

0 150 300 450

SCALE 1" = 150'

100 Q_{100}=258.1cfs. A=159.9 ac. T_c = 22.6min.

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EXISTING CONDITIONS DRAINAGE MAP

THE FARM

CITY OF POWAY, CALIFORNIA

SHEET 1 OF 2

W.O. 3355-01

LEGEND

PROJECT BOUNDARY

WATERSHED BOUNDARY

WATERSHED SUB-BOUNDARY

FLOWLINE

300 — Q_{100} = 177.1cfs. A=91.20 ac. T_c =13.15min.

400 — Q_{100} = 9.05cfs. A= 5.4 ac. T_c = 9.95 min.

0 150 300 450

SCALE 1" = 150'

THE FARM

EXISTING CONDITIONS DRAINAGE MAP

CITY OF POWAY, CALIFORNIA

SHEET 2 OF 2

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W.O. 3355-01

100 YEAR EXISTING CONDITIONS

HYDROLOGY ANALYSIS

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

                           Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* THE FARM                                                              *
* EXISTING CONDITIONS HYDROLOGY - INCLUDES OFFSITE ANALYSIS             *
*                                                                       *
 ************************************************************************

  FILE NAME: H:\AES2010\1390\2018\E2\EX-100.DAT
  TIME/DATE OF STUDY: 11:10 03/31/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.300
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    104.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =    741.00
  DOWNSTREAM ELEVATION(FEET) =    735.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.593
```



```
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.641
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    110.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    697.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   683.00   CHANNEL SLOPE =  0.0556
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0556 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.56
  FLOW VELOCITY(FEET/SEC) =   1.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.62   Tc(MIN.) =   16.21
  LONGEST FLOWPATH FROM NODE    102.00 TO NODE    110.00 =     778.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.071
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =    3.62   SUBAREA RUNOFF(CFS) =    4.42
  TOTAL AREA(ACRES) =        3.9   TOTAL RUNOFF(CFS) =       4.76
  TC(MIN.) =   16.21

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.21
  RAINFALL INTENSITY(INCH/HR) =   4.07
  TOTAL STREAM AREA(ACRES) =     3.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.76

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   187.00
  UPSTREAM ELEVATION(FEET) =    810.00
  DOWNSTREAM ELEVATION(FEET) =    803.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.389
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    96.86
           (Reference: Table 3-1B of Hydrology Manual)
```

```
         THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.423
SUBAREA RUNOFF(CFS) =      1.84
TOTAL AREA(ACRES) =      0.46   TOTAL RUNOFF(CFS) =      1.84

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  803.00  DOWNSTREAM ELEVATION(FEET) =  720.00
 STREET LENGTH(FEET) =  1698.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.62
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.52
   HALFSTREET FLOOD WIDTH(FEET) =   19.88
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.06
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.66
 STREET FLOW TRAVEL TIME(MIN.) =   4.01   Tc(MIN.) =   10.40
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.423
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
 SUBAREA AREA(ACRES) =   34.10      SUBAREA RUNOFF(CFS) =   99.86
 TOTAL AREA(ACRES) =       34.6        PEAK FLOW RATE(CFS) =     101.20

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  25.74
 FLOW VELOCITY(FEET/SEC.) =  8.28   DEPTH*VELOCITY(FT*FT/SEC.) =   5.15
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1698.0 FT WITH ELEVATION-DROP =  83.0 FT, IS  143.4 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    106.00
 LONGEST FLOWPATH FROM NODE    103.00 TO NODE    106.00 =    1885.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.40
 RAINFALL INTENSITY(INCH/HR) =   5.42
 TOTAL STREAM AREA(ACRES) =    34.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    101.20

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    108.00 IS CODE =  21
----------------------------------------------------------------------------
```



```
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
 UPSTREAM ELEVATION(FEET) =    720.00
 DOWNSTREAM ELEVATION(FEET) =    708.00
 ELEVATION DIFFERENCE(FEET) =     12.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.865
 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) =  7.087
 SUBAREA RUNOFF(CFS) =      0.57
 TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    110.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    717.00  DOWNSTREAM(FEET) =    697.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   506.00   CHANNEL SLOPE =  0.0395
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0395 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.57
 FLOW VELOCITY(FEET/SEC) =   1.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.57   Tc(MIN.) =   14.44
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    110.00 =     636.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.387
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    3.90   SUBAREA RUNOFF(CFS) =    5.13
 TOTAL AREA(ACRES) =       4.2   TOTAL RUNOFF(CFS) =       5.49
 TC(MIN.) =   14.44

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 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.) =   14.44
 RAINFALL INTENSITY(INCH/HR) =   4.39
 TOTAL STREAM AREA(ACRES) =     4.17
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.49

 ** CONFLUENCE DATA **
```

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	4.76	16.21	4.071	3.90
2	101.20	10.40	5.423	34.56
3	5.49	14.44	4.387	4.17

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	108.21	10.40	5.423
2	91.60	14.44	4.387
3	85.84	16.21	4.071

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 108.21 Tc(MIN.) = 10.40
TOTAL AREA(ACRES) = 42.6
LONGEST FLOWPATH FROM NODE 103.00 TO NODE 110.00 = 1885.00 FEET.

****
FLOW PROCESS FROM NODE 110.00 TO NODE 112.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 697.00 DOWNSTREAM(FEET) = 689.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 374.00 CHANNEL SLOPE = 0.0214
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0214 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 108.21
FLOW VELOCITY(FEET/SEC) = 3.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.60 Tc(MIN.) = 12.00
LONGEST FLOWPATH FROM NODE 103.00 TO NODE 112.00 = 2259.00 FEET.

****
FLOW PROCESS FROM NODE 110.00 TO NODE 112.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.945
RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) = 80
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4916
SUBAREA AREA(ACRES) = 2.99 SUBAREA RUNOFF(CFS) = 6.65
TOTAL AREA(ACRES) = 45.6 TOTAL RUNOFF(CFS) = 110.90
TC(MIN.) = 12.00

****
FLOW PROCESS FROM NODE 112.00 TO NODE 114.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 689.00 DOWNSTREAM(FEET) = 671.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 449.00 CHANNEL SLOPE = 0.0401
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0401 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 110.90
FLOW VELOCITY(FEET/SEC) = 5.38 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

TRAVEL TIME(MIN.) = 1.39 Tc(MIN.) = 13.39
LONGEST FLOWPATH FROM NODE 103.00 TO NODE 114.00 = 2708.00 FEET.

****
FLOW PROCESS FROM NODE 112.00 TO NODE 114.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.607
RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) = 80
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4883
SUBAREA AREA(ACRES) = 3.97 SUBAREA RUNOFF(CFS) = 8.23
TOTAL AREA(ACRES) = 49.6 TOTAL RUNOFF(CFS) = 111.55
TC(MIN.) = 13.39

****
FLOW PROCESS FROM NODE 114.00 TO NODE 116.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 671.00 DOWNSTREAM(FEET) = 643.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 395.00 CHANNEL SLOPE = 0.0709
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0709 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 111.55
FLOW VELOCITY(FEET/SEC) = 7.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.92 Tc(MIN.) = 14.31
LONGEST FLOWPATH FROM NODE 103.00 TO NODE 116.00 = 3103.00 FEET.

****
FLOW PROCESS FROM NODE 114.00 TO NODE 116.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.414
RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) = 80
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4860
SUBAREA AREA(ACRES) = 3.16 SUBAREA RUNOFF(CFS) = 6.28
TOTAL AREA(ACRES) = 52.8 TOTAL RUNOFF(CFS) = 113.15
TC(MIN.) = 14.31

****
FLOW PROCESS FROM NODE 116.00 TO NODE 118.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 643.00 DOWNSTREAM(FEET) = 601.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 842.00 CHANNEL SLOPE = 0.0499
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0499 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 113.15
FLOW VELOCITY(FEET/SEC) = 6.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.32 Tc(MIN.) = 16.63
LONGEST FLOWPATH FROM NODE 103.00 TO NODE 118.00 = 3945.00 FEET.

****

```
 FLOW PROCESS FROM NODE    116.00 TO NODE    118.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.005
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  80
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4797
 SUBAREA AREA(ACRES) =   11.20   SUBAREA RUNOFF(CFS) =   20.19
 TOTAL AREA(ACRES) =       64.0   TOTAL RUNOFF(CFS) =     122.87
 TC(MIN.) =   16.63

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    100.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    601.00  DOWNSTREAM(FEET) =    587.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1085.00   CHANNEL SLOPE =  0.0129
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0129 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     122.87
 FLOW VELOCITY(FEET/SEC) =   3.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.73   Tc(MIN.) =   22.36
 LONGEST FLOWPATH FROM NODE    103.00 TO NODE    100.00 =    5030.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.309
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  80
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4740
 SUBAREA AREA(ACRES) =   15.34   SUBAREA RUNOFF(CFS) =   22.84
 TOTAL AREA(ACRES) =       79.3   TOTAL RUNOFF(CFS) =     124.36
 TC(MIN.) =   22.36

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    120.00 TO NODE    122.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  80
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    98.00
 UPSTREAM ELEVATION(FEET) =    795.00
 DOWNSTREAM ELEVATION(FEET) =    785.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.376
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```



```
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.297
 SUBAREA RUNOFF(CFS) =      1.23
 TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.23

****************************************************************************
 FLOW PROCESS FROM NODE    122.00 TO NODE    124.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    785.00  DOWNSTREAM(FEET) =    749.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   364.00   CHANNEL SLOPE =  0.0989
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0989 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =       1.23
 FLOW VELOCITY(FEET/SEC) =   1.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.21   Tc(MIN.) =    8.59
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    124.00 =     462.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    122.00 TO NODE    124.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.133
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  80
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500
 SUBAREA AREA(ACRES) =    0.85   SUBAREA RUNOFF(CFS) =    2.35
 TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       3.26
 TC(MIN.) =    8.59

****************************************************************************
 FLOW PROCESS FROM NODE    124.00 TO NODE    126.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    749.00  DOWNSTREAM(FEET) =    699.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   578.00   CHANNEL SLOPE =  0.0865
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0865 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =       3.26
 FLOW VELOCITY(FEET/SEC) =   2.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.95   Tc(MIN.) =   12.54
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    126.00 =    1040.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    124.00 TO NODE    126.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.806
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  80
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500
 SUBAREA AREA(ACRES) =    4.15   SUBAREA RUNOFF(CFS) =    8.97
 TOTAL AREA(ACRES) =        5.3   TOTAL RUNOFF(CFS) =      11.53
 TC(MIN.) =   12.54
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    128.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    699.00  DOWNSTREAM(FEET) =    647.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   805.00   CHANNEL SLOPE =  0.0646
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0646 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      11.53
  FLOW VELOCITY(FEET/SEC) =   3.21 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.18   Tc(MIN.) =   16.71
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    128.00 =    1845.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    128.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.992
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  80
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500
  SUBAREA AREA(ACRES) =   16.30   SUBAREA RUNOFF(CFS) =   29.28
  TOTAL AREA(ACRES) =       21.6   TOTAL RUNOFF(CFS) =      38.86
  TC(MIN.) =   16.71

**************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    130.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    647.00  DOWNSTREAM(FEET) =    589.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1400.00   CHANNEL SLOPE =  0.0414
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0414 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      38.86
  FLOW VELOCITY(FEET/SEC) =   3.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.05   Tc(MIN.) =   22.77
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    130.00 =    3245.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    130.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.271
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  80
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500
  SUBAREA AREA(ACRES) =    4.44   SUBAREA RUNOFF(CFS) =    6.53
  TOTAL AREA(ACRES) =       26.1   TOTAL RUNOFF(CFS) =      38.86
  TC(MIN.) =   22.77
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =   1
--------------------------------------------------------------------------
```



```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.77
  RAINFALL INTENSITY(INCH/HR) =   3.27
  TOTAL STREAM AREA(ACRES) =    26.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.86

**************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    125.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =    720.00
  DOWNSTREAM ELEVATION(FEET) =    710.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.606
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    95.83
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.265
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.59

**************************************************************************
  FLOW PROCESS FROM NODE    125.00 TO NODE    127.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  720.00  DOWNSTREAM ELEVATION(FEET) =  600.00
  STREET LENGTH(FEET) =  2167.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.66
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.54
    HALFSTREET FLOOD WIDTH(FEET) =   21.21
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.22
  STREET FLOW TRAVEL TIME(MIN.) =   4.63   Tc(MIN.) =   11.24
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.157
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  SUBAREA AREA(ACRES) =   45.83      SUBAREA RUNOFF(CFS) =  127.62
```

```
 TOTAL AREA(ACRES) =       46.0        PEAK FLOW RATE(CFS) =     128.04

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  27.54
 FLOW VELOCITY(FEET/SEC.) =  9.19   DEPTH*VELOCITY(FT*FT/SEC.) =   6.01
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 2167.0 FT WITH ELEVATION-DROP = 120.0 FT, IS  197.8 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    127.00
 LONGEST FLOWPATH FROM NODE    123.00 TO NODE    127.00 =    2467.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    127.00 TO NODE    130.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    600.00  DOWNSTREAM(FEET) =    589.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   371.00   CHANNEL SLOPE =  0.0296
 CHANNEL FLOW THRU SUBAREA(CFS) =     128.04
 FLOW VELOCITY(FEET/SEC) =   8.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   11.94
 LONGEST FLOWPATH FROM NODE    123.00 TO NODE    130.00 =    2838.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =   11.94
 RAINFALL INTENSITY(INCH/HR) =   4.96
 TOTAL STREAM AREA(ACRES) =    45.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    128.04

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       38.86    22.77        3.271         26.07
     2      128.04    11.94        4.959         45.98

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      148.42    11.94       4.959
     2      123.30    22.77       3.271

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     148.42   Tc(MIN.) =   11.94
 TOTAL AREA(ACRES) =       72.1
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    130.00 =    3245.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    100.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
 ELEVATION DATA: UPSTREAM(FEET) =    589.00  DOWNSTREAM(FEET) =    587.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   354.00   CHANNEL SLOPE =  0.0056
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0056 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     148.42
 FLOW VELOCITY(FEET/SEC) =   2.22 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =   14.59
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    100.00 =    3599.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.357
 RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  80
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5013
 SUBAREA AREA(ACRES) =    8.57   SUBAREA RUNOFF(CFS) =   16.80
 TOTAL AREA(ACRES) =       80.6   TOTAL RUNOFF(CFS) =     176.11
 TC(MIN.) =   14.59

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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      176.11    14.59       4.357       80.62
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    100.00 =    3599.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      124.36    22.36       3.309       79.29
 LONGEST FLOWPATH FROM NODE    103.00 TO NODE    100.00 =    5030.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     257.29      14.59        4.357
     2     258.11      22.36        3.309

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     258.11   Tc(MIN.) =   22.36
 TOTAL AREA(ACRES) =      159.9

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

+----------------------------------------------------------------------------+
| BEGIN 200 SERIES HYDROLOGY                                                 |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    204.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =  80
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   255.00
 UPSTREAM ELEVATION(FEET) =    800.00
 DOWNSTREAM ELEVATION(FEET) =    765.00
 ELEVATION DIFFERENCE(FEET) =     35.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.517
 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) =  7.328
 SUBAREA RUNOFF(CFS) =      0.94
 TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.94

****************************************************************************
 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) =    765.00  DOWNSTREAM(FEET) =    705.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   601.00   CHANNEL SLOPE =  0.0998
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.94
 FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =    8.63
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    206.00 =     856.00 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) =  6.114
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =  80
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3200
 SUBAREA AREA(ACRES) =    7.08   SUBAREA RUNOFF(CFS) =   13.85
 TOTAL AREA(ACRES) =       7.5   TOTAL RUNOFF(CFS) =      14.63
 TC(MIN.) =    8.63

****************************************************************************
 FLOW PROCESS FROM NODE    206.00 TO NODE    208.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    705.00  DOWNSTREAM(FEET) =    663.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   750.00   CHANNEL SLOPE =  0.0560
 CHANNEL FLOW THRU SUBAREA(CFS) =      14.63
 FLOW VELOCITY(FEET/SEC) =   6.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.92   Tc(MIN.) =   10.55
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    208.00 =    1606.00 FEET.
```



```
****************************************************************************
 FLOW PROCESS FROM NODE    206.00 TO NODE    208.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.373
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3741
 SUBAREA AREA(ACRES) =    8.81   SUBAREA RUNOFF(CFS) =   19.88
 TOTAL AREA(ACRES) =      16.3   TOTAL RUNOFF(CFS) =      32.74
 TC(MIN.) =   10.55

****************************************************************************
 FLOW PROCESS FROM NODE    208.00 TO NODE    200.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  663.00  DOWNSTREAM ELEVATION(FEET) =  647.00
 STREET LENGTH(FEET) =   608.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.37
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.52
   HALFSTREET FLOOD WIDTH(FEET) =   20.04
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.21
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.71
 STREET FLOW TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =   12.49
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.817
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.414
 SUBAREA AREA(ACRES) =    5.10      SUBAREA RUNOFF(CFS) =   13.27
 TOTAL AREA(ACRES) =       21.4        PEAK FLOW RATE(CFS) =      42.62

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  20.74
 FLOW VELOCITY(FEET/SEC.) =  5.28   DEPTH*VELOCITY(FT*FT/SEC.) =   2.81
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =    2214.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.49
```

```
 RAINFALL INTENSITY(INCH/HR) =   4.82
 TOTAL STREAM AREA(ACRES) =    21.39
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.62

****************************************************************************
 FLOW PROCESS FROM NODE    210.00 TO NODE    212.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =  84
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   190.00
 UPSTREAM ELEVATION(FEET) =    745.00
 DOWNSTREAM ELEVATION(FEET) =    735.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.072
 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) =  6.384
 SUBAREA RUNOFF(CFS) =      0.33
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
 FLOW PROCESS FROM NODE    212.00 TO NODE    200.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  735.00  DOWNSTREAM ELEVATION(FEET) =  646.00
 STREET LENGTH(FEET) =  1400.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.33
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =    9.72
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.46
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.84
 STREET FLOW TRAVEL TIME(MIN.) =   4.27   Tc(MIN.) =   12.35
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.854
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.320
 SUBAREA AREA(ACRES) =   14.00      SUBAREA RUNOFF(CFS) =   21.74
 TOTAL AREA(ACRES) =       14.2        PEAK FLOW RATE(CFS) =      21.99

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.16
 FLOW VELOCITY(FEET/SEC.) =  6.32   DEPTH*VELOCITY(FT*FT/SEC.) =   2.51
```



```
 LONGEST FLOWPATH FROM NODE    210.00 TO NODE    200.00 =    1590.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 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.) =   12.35
 RAINFALL INTENSITY(INCH/HR) =   4.85
 TOTAL STREAM AREA(ACRES) =    14.16
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.99

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       42.62    12.49        4.817         21.39
     2       21.99    12.35        4.854         14.16

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       64.11    12.35       4.854
     2       64.44    12.49       4.817

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      64.44   Tc(MIN.) =   12.49
 TOTAL AREA(ACRES) =       35.6
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =    2214.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    214.00 TO NODE    216.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   156.00
 UPSTREAM ELEVATION(FEET) =    735.00
 DOWNSTREAM ELEVATION(FEET) =    730.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.767
 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) =  5.645
 SUBAREA RUNOFF(CFS) =      0.51
 TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.51
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    216.00 TO NODE    218.00 IS CODE =  52
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    730.00  DOWNSTREAM(FEET) =    660.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1051.00   CHANNEL SLOPE =  0.0666
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.51
 FLOW VELOCITY(FEET/SEC) =   3.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.52   Tc(MIN.) =   14.29
 LONGEST FLOWPATH FROM NODE    214.00 TO NODE    218.00 =    1207.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    216.00 TO NODE    218.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.416
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    9.50   SUBAREA RUNOFF(CFS) =   12.59
 TOTAL AREA(ACRES) =        9.8   TOTAL RUNOFF(CFS) =      12.98
 TC(MIN.) =   14.29

**************************************************************************
 FLOW PROCESS FROM NODE    216.00 TO NODE    218.00 IS CODE =  10
--------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==========================================================================

**************************************************************************
 FLOW PROCESS FROM NODE    213.00 TO NODE    215.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   206.00
 UPSTREAM ELEVATION(FEET) =    810.00
 DOWNSTREAM ELEVATION(FEET) =    808.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.152
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    64.13
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.343
 SUBAREA RUNOFF(CFS) =      1.44
 TOTAL AREA(ACRES) =      0.42   TOTAL RUNOFF(CFS) =      1.44

**************************************************************************
 FLOW PROCESS FROM NODE    215.00 TO NODE    217.00 IS CODE =  62
--------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
 UPSTREAM ELEVATION(FEET) =  808.00  DOWNSTREAM ELEVATION(FEET) =  690.00
```



```
 STREET LENGTH(FEET) =  1360.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.64
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.29
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.77
 STREET FLOW TRAVEL TIME(MIN.) =   2.73   Tc(MIN.) =   10.88
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.267
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
 SUBAREA AREA(ACRES) =   28.77      SUBAREA RUNOFF(CFS) =   81.82
 TOTAL AREA(ACRES) =       29.2        PEAK FLOW RATE(CFS) =      83.02

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  21.29
 FLOW VELOCITY(FEET/SEC.) =  9.79   DEPTH*VELOCITY(FT*FT/SEC.) =   5.31
 LONGEST FLOWPATH FROM NODE    213.00 TO NODE    217.00 =    1566.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    216.00 TO NODE    218.00 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       83.02    10.88       5.267       29.19
 LONGEST FLOWPATH FROM NODE    213.00 TO NODE    218.00 =    1566.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       12.98    14.29       4.416        9.80
 LONGEST FLOWPATH FROM NODE    214.00 TO NODE    218.00 =    1207.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      92.90      10.88        5.267
     2      82.60      14.29        4.416

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      92.90   Tc(MIN.) =   10.88
 TOTAL AREA(ACRES) =       39.0

**************************************************************************
 FLOW PROCESS FROM NODE    216.00 TO NODE    218.00 IS CODE =  12
```

```
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    200.00 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) =   645.00
  FLOW LENGTH(FEET) =   667.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.13
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      92.90
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =   11.61
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    200.00 =    2233.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       92.90    11.61       5.049       38.99
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    200.00 =    2233.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       64.44    12.49       4.817       35.55
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =    2214.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     152.80      11.61        5.049
      2     153.06      12.49        4.817

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     153.06   Tc(MIN.) =   12.49
  TOTAL AREA(ACRES) =       74.5

********************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
================================================================================

+------------------------------------------------------------------------------+
| BEGIN 300 SERIES                                                             |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    300.00 IS CODE =  52
--------------------------------------------------------------------------------
```



```
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    645.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00   CHANNEL SLOPE =  0.0444
  CHANNEL FLOW THRU SUBAREA(CFS) =     153.06
  FLOW VELOCITY(FEET/SEC) =  11.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =   13.15
  LONGEST FLOWPATH FROM NODE    213.00 TO NODE    300.00 =    2683.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =   13.15
  RAINFALL INTENSITY(INCH/HR) =   4.66
  TOTAL STREAM AREA(ACRES) =    74.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    153.06

********************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    304.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   139.00
  UPSTREAM ELEVATION(FEET) =    745.00
  DOWNSTREAM ELEVATION(FEET) =    740.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.989
  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) =  6.427
  SUBAREA RUNOFF(CFS) =      0.81
  TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.81

********************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    300.00 IS CODE =  52
--------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1715.00   CHANNEL SLOPE =  0.0671
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.81
  FLOW VELOCITY(FEET/SEC) =   3.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.36   Tc(MIN.) =   15.35
  LONGEST FLOWPATH FROM NODE    302.00 TO NODE    300.00 =    1854.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    300.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.218
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4200
 SUBAREA AREA(ACRES) =   10.80   SUBAREA RUNOFF(CFS) =   19.13
 TOTAL AREA(ACRES) =       11.1   TOTAL RUNOFF(CFS) =      19.66
 TC(MIN.) =   15.35

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =   15.35
 RAINFALL INTENSITY(INCH/HR) =   4.22
 TOTAL STREAM AREA(ACRES) =    11.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.66

****************************************************************************
 FLOW PROCESS FROM NODE    306.00 TO NODE    308.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   143.00
 UPSTREAM ELEVATION(FEET) =    675.00
 DOWNSTREAM ELEVATION(FEET) =    670.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.488
 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) =  5.752
 SUBAREA RUNOFF(CFS) =      0.52
 TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
 FLOW PROCESS FROM NODE    308.00 TO NODE    300.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    670.00  DOWNSTREAM(FEET) =    625.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   871.00   CHANNEL SLOPE =  0.0517
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.52
 FLOW VELOCITY(FEET/SEC) =   3.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.26   Tc(MIN.) =   13.75
 LONGEST FLOWPATH FROM NODE    306.00 TO NODE    300.00 =    1014.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    308.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.529
```



```
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    5.24   SUBAREA RUNOFF(CFS) =    7.12
 TOTAL AREA(ACRES) =        5.5   TOTAL RUNOFF(CFS) =       7.53
 TC(MIN.) =   13.75

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =   13.75
 RAINFALL INTENSITY(INCH/HR) =   4.53
 TOTAL STREAM AREA(ACRES) =     5.54
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.53

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      153.06    13.15        4.660         74.54
     2       19.66    15.35        4.218         11.10
     3        7.53    13.75        4.529          5.54

 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      177.11    13.15       4.660
     2      173.90    13.75       4.529
     3      165.22    15.35       4.218

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     177.11   Tc(MIN.) =   13.15
 TOTAL AREA(ACRES) =       91.2
 LONGEST FLOWPATH FROM NODE    213.00 TO NODE    300.00 =    2683.00 FEET.

+----------------------------------------------------------------------------+
| BEGIN 400 SERIES                                                           |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

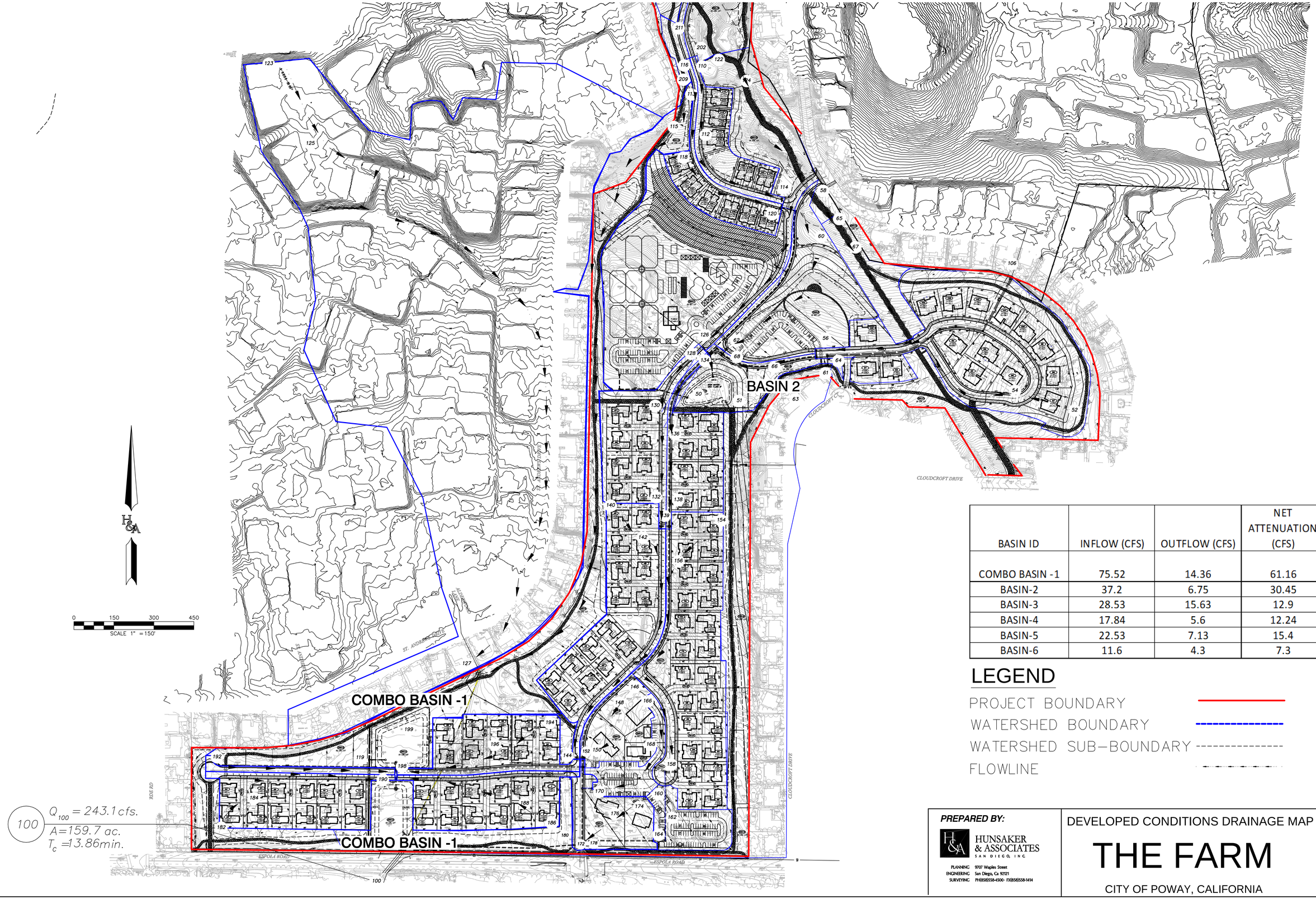
****************************************************************************
 FLOW PROCESS FROM NODE    402.00 TO NODE    404.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
 UPSTREAM ELEVATION(FEET) =    745.00
 DOWNSTREAM ELEVATION(FEET) =    735.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.295
```

```
 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) =  6.814
 SUBAREA RUNOFF(CFS) =      0.41
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
 FLOW PROCESS FROM NODE    404.00 TO NODE    400.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    735.00  DOWNSTREAM(FEET) =    685.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   658.00   CHANNEL SLOPE =  0.0760
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.41
 FLOW VELOCITY(FEET/SEC) =   4.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =    9.95
 LONGEST FLOWPATH FROM NODE    402.00 TO NODE    400.00 =     788.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    404.00 TO NODE    400.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.579
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    5.21   SUBAREA RUNOFF(CFS) =    8.72
 TOTAL AREA(ACRES) =        5.4   TOTAL RUNOFF(CFS) =       9.05
 TC(MIN.) =    9.95
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        5.4  TC(MIN.) =      9.95
 PEAK FLOW RATE(CFS)   =       9.05
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

DEVELOPED CONDITIONS



BASIN ID	INFLOW (CFS)	OUTFLOW (CFS)	NET ATTENUATION (CFS)
COMBO BASIN -1	75.52	14.36	61.16
BASIN-2	37.2	6.75	30.45
BASIN-3	28.53	15.63	12.9
BASIN-4	17.84	5.6	12.24
BASIN-5	22.53	7.13	15.4
BASIN-6	11.6	4.3	7.3

LEGEND

PROJECT BOUNDARY

WATERSHED BOUNDARY

WATERSHED SUB-BOUNDARY

FLOWLINE

PREPARED BY:

HUNSAKER & ASSOCIATES SAN DIEGO, INC

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

DEVELOPED CONDITIONS DRAINAGE MAP

THE FARM

CITY OF POWAY, CALIFORNIA

SHEET 1 OF 2

W.O. 3355-01

LEGEND

PROJECT BOUNDARY

WATERSHED BOUNDARY

WATERSHED SUB-BOUNDARY

FLOWLINE

0 150 300 450

SCALE 1" =150'

Q_{100} =174.95cfs.
A= 90.8 ac.
T_c =13.4 min.
300

Q_{100} =7.13 cfs.
A= 5.7 ac.
T_c = 6.0 min.
400

BASIN 6

BASIN 4

BASIN 3

BASIN 5

ST. ANDREWS DRIVE

GLEN ARVEN LANE

BURNING HILLS DRIVE

DEL MAR MESA ROAD

TIERRA CANYON

BASIN ID	INFLOW (CFS)	OUTFLOW (CFS)	NET ATTENUATION (CFS)
COMBO BASIN -1	75.52	14.36	61.16
BASIN-2	37.2	6.75	30.45
BASIN-3	28.53	15.63	12.9
BASIN-4	17.84	5.6	12.24
BASIN-5	22.53	7.13	15.4
BASIN-6	11.6	4.3	7.3

PREPARED BY:

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PLANNING 9707 Waples Street
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SURVEYING PH(858)558-4500 - FX(858)558-1414

DEVELOPED CONDITIONS DRAINAGE MAP

THE FARM

CITY OF POWAY, CALIFORNIA

SHEET 2 OF 2

W.O. 3355-01

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:




 ************************** DESCRIPTION OF STUDY **************************
* THE FARMS AT STONERIDGE - POWAY, CA                                      *
* PROPOSED CONDITION HYDROLOGY                                             *
*                                                                          *
 **************************************************************************

  FILE NAME: H:\AES2010\1390\2019\P2\Q100.DAT
  TIME/DATE OF STUDY: 10:06 09/23/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.300
  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 0.0312 0.125 0.0160
  2   15.0      7.5    0.020/0.020/0.020   0.50    1.50 0.0312 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.*

+----------------------------------------------------------------------------+
| BEGIN ONSITE 50 SERIES                                                     |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    714.00
  DOWNSTREAM ELEVATION(FEET) =    712.50
```



```
  ELEVATION DIFFERENCE(FEET) =      1.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.443
  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) =  6.201
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     56.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  712.50  DOWNSTREAM ELEVATION(FEET) =  690.00
  STREET LENGTH(FEET) =   600.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.38
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.57
  STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   10.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.394
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
  SUBAREA AREA(ACRES) =    7.64      SUBAREA RUNOFF(CFS) =   19.78
  TOTAL AREA(ACRES) =        7.8        PEAK FLOW RATE(CFS) =      20.17

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.80
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.19
  LONGEST FLOWPATH FROM NODE     52.00 TO NODE     56.00 =     700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 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.) =   10.48
  RAINFALL INTENSITY(INCH/HR) =   5.39
  TOTAL STREAM AREA(ACRES) =     7.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.17

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     67.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
```

```
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.50
 UPSTREAM ELEVATION(FEET) =    746.00
 DOWNSTREAM ELEVATION(FEET) =    740.00
 ELEVATION DIFFERENCE(FEET) =      6.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.660
 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) =  6.101
 SUBAREA RUNOFF(CFS) =      0.27
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
 FLOW PROCESS FROM NODE     67.00 TO NODE     56.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    740.00  DOWNSTREAM(FEET) =    690.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   394.00   CHANNEL SLOPE =  0.1269
 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) =       0.27
 FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   10.04
 LONGEST FLOWPATH FROM NODE     65.00 TO NODE     56.00 =     524.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     67.00 TO NODE     56.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.544
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    1.19   SUBAREA RUNOFF(CFS) =    1.98
 TOTAL AREA(ACRES) =       1.3   TOTAL RUNOFF(CFS) =       2.23
 TC(MIN.) =   10.04

****************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.04
 RAINFALL INTENSITY(INCH/HR) =   5.54
 TOTAL STREAM AREA(ACRES) =     1.34
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.23

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       20.17    10.48        5.394          7.79
     2        2.23    10.04        5.544          1.34

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

 ** PEAK FLOW RATE TABLE **
```



```
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       21.55    10.04       5.544
     2       22.34    10.48       5.394

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      22.34   Tc(MIN.) =   10.48
 TOTAL AREA(ACRES) =        9.1
 LONGEST FLOWPATH FROM NODE     52.00 TO NODE     56.00 =     700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     68.00 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) =   200.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.76
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      22.34
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   10.65
 LONGEST FLOWPATH FROM NODE     52.00 TO NODE     68.00 =     900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     68.00 TO NODE     68.00 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.) =   10.65
 RAINFALL INTENSITY(INCH/HR) =   5.34
 TOTAL STREAM AREA(ACRES) =     9.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.34

****************************************************************************
 FLOW PROCESS FROM NODE     58.00 TO NODE     60.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 UPSTREAM ELEVATION(FEET) =    744.50
 DOWNSTREAM ELEVATION(FEET) =    734.00
 ELEVATION DIFFERENCE(FEET) =     10.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.834
 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) =  7.871
 SUBAREA RUNOFF(CFS) =      0.57
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     62.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  734.00  DOWNSTREAM ELEVATION(FEET) =  672.00
 STREET LENGTH(FEET) =   500.00   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) =       7.87
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.89
  STREET FLOW TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =    6.96
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.025
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.538
  SUBAREA AREA(ACRES) =    3.85      SUBAREA RUNOFF(CFS) =   14.61
  TOTAL AREA(ACRES) =        4.0        PEAK FLOW RATE(CFS) =      15.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.76
  FLOW VELOCITY(FEET/SEC.) =  8.53   DEPTH*VELOCITY(FT*FT/SEC.) =   2.57
  LONGEST FLOWPATH FROM NODE     58.00 TO NODE     62.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     68.00 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) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.56
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.11
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    6.98
  LONGEST FLOWPATH FROM NODE     58.00 TO NODE     68.00 =     675.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     68.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.98
  RAINFALL INTENSITY(INCH/HR) =   7.01
  TOTAL STREAM AREA(ACRES) =     4.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.11

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
```



```
  UPSTREAM ELEVATION(FEET) =    690.00
  DOWNSTREAM ELEVATION(FEET) =    682.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.388
  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) =  7.424
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     68.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  682.00  DOWNSTREAM ELEVATION(FEET) =  670.00
  STREET LENGTH(FEET) =   200.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    3.89
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.57
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.93
  STREET FLOW TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =    7.12
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.924
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
  SUBAREA AREA(ACRES) =    1.16      SUBAREA RUNOFF(CFS) =    3.86
  TOTAL AREA(ACRES) =        1.3        PEAK FLOW RATE(CFS) =       4.35

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.67
  FLOW VELOCITY(FEET/SEC.) =  4.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
  LONGEST FLOWPATH FROM NODE     64.00 TO NODE     68.00 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     68.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.12
  RAINFALL INTENSITY(INCH/HR) =   6.92
  TOTAL STREAM AREA(ACRES) =     1.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.35

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

```
     1       22.34    10.65        5.338          9.13
     2       15.11     6.98        7.009          4.00
     3        4.35     7.12        6.924          1.31

  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       36.40     6.98       7.009
     2       36.50     7.12       6.924
     3       37.20    10.65       5.338

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      37.20   Tc(MIN.) =   10.65
  TOTAL AREA(ACRES) =       14.4
  LONGEST FLOWPATH FROM NODE     52.00 TO NODE     68.00 =     900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     50.00 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) =   647.40
  FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.68
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      37.20
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   10.73
  LONGEST FLOWPATH FROM NODE     52.00 TO NODE     50.00 =    1025.00 FEET.

+----------------------------------------------------------------------------+
| THE FOLLOWING CODE 7 IS THE ATTENUATED FLOW FROM BASIN 2                   |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  11.00   RAIN INTENSITY(INCH/HOUR) =  5.23
  TOTAL AREA(ACRES) =    14.40   TOTAL RUNOFF(CFS) =      6.75

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.00  DOWNSTREAM(FEET) =   645.00
  FLOW LENGTH(FEET) =    45.00   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.) =   8.37
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.75
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   11.09
  LONGEST FLOWPATH FROM NODE     52.00 TO NODE     51.00 =    1070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     51.00 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.) =   11.09
  RAINFALL INTENSITY(INCH/HR) =   5.20
  TOTAL STREAM AREA(ACRES) =    14.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.75

+----------------------------------------------------------------------------+
| THE FOLLOWING CODE 7 IS TAKEN FROM NODE 106 IN EXISTING CONDITIONS         |
| HYDROLOGY                                                                  |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.40   RAIN INTENSITY(INCH/HOUR) =  5.42
  TOTAL AREA(ACRES) =    34.60   TOTAL RUNOFF(CFS) =    101.20

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE     51.00 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) =   575.00
  FLOW LENGTH(FEET) =  1233.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.69
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     101.20
  PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =   11.09
  LONGEST FLOWPATH FROM NODE     58.00 TO NODE     51.00 =    1908.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     51.00 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.) =   11.09
  RAINFALL INTENSITY(INCH/HR) =   5.20
  TOTAL STREAM AREA(ACRES) =    34.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    101.20

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1         6.75    11.09        5.201         14.40
     2       101.20    11.09        5.201         34.60

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       107.93    11.09       5.201
     2       107.95    11.09       5.201
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     107.95   Tc(MIN.) =   11.09
 TOTAL AREA(ACRES) =       49.0
 LONGEST FLOWPATH FROM NODE     58.00 TO NODE     51.00 =    1908.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     51.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   645.00  DOWNSTREAM(FEET) =   575.00
 FLOW LENGTH(FEET) =  2840.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.11
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     107.95
 PIPE TRAVEL TIME(MIN.) =   2.77    Tc(MIN.) =   13.86
 LONGEST FLOWPATH FROM NODE     58.00 TO NODE    100.00 =    4748.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   13.86
 RAINFALL INTENSITY(INCH/HR) =   4.50
 TOTAL STREAM AREA(ACRES) =    49.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    107.95

****************************************************************************
 FLOW PROCESS FROM NODE     61.00 TO NODE     63.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   160.00
 UPSTREAM ELEVATION(FEET) =    688.00
 DOWNSTREAM ELEVATION(FEET) =    682.00
 ELEVATION DIFFERENCE(FEET) =      6.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.070
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    96.88
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.953
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE    100.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    600.00  DOWNSTREAM(FEET) =    575.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3009.00   CHANNEL SLOPE =  0.0083
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.50
 FLOW VELOCITY(FEET/SEC) =   1.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  36.68   Tc(MIN.) =   43.75
 LONGEST FLOWPATH FROM NODE     61.00 TO NODE    100.00 =    3169.00 FEET.
```



```
****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.146
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3027
 SUBAREA AREA(ACRES) =    9.77   SUBAREA RUNOFF(CFS) =    6.29
 TOTAL AREA(ACRES) =        9.9   TOTAL RUNOFF(CFS) =       6.44
 TC(MIN.) =   43.75

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   43.75
 RAINFALL INTENSITY(INCH/HR) =   2.15
 TOTAL STREAM AREA(ACRES) =     9.92
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.44

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      107.95    13.86        4.505         49.00
     2        6.44    43.75        2.146          9.92

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      109.99    13.86        4.505
     2       57.87    43.75        2.146

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     109.99   Tc(MIN.) =   13.86
 TOTAL AREA(ACRES) =       58.9
 LONGEST FLOWPATH FROM NODE     58.00 TO NODE    100.00 =    4748.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| BEGIN ONSITE 100 SERIES                                                  |
| TRIBUTARY TO COMBO BASIN                                                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
```

```
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 UPSTREAM ELEVATION(FEET) =    776.00
 DOWNSTREAM ELEVATION(FEET) =    760.00
 ELEVATION DIFFERENCE(FEET) =     16.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.388
 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) =  7.424
 SUBAREA RUNOFF(CFS) =      0.53
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    114.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  760.00  DOWNSTREAM ELEVATION(FEET) =  740.00
 STREET LENGTH(FEET) =   400.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.78
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.22
   HALFSTREET FLOOD WIDTH(FEET) =    4.55
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.93
 STREET FLOW TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =    7.94
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.450
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    1.45      SUBAREA RUNOFF(CFS) =    4.49
 TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =       4.95

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.42
 FLOW VELOCITY(FEET/SEC.) =  4.67   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    114.00 =     700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    114.00 TO NODE    117.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   736.00  DOWNSTREAM(FEET) =   732.00
 FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.60
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.95
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    7.96
```



```
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    117.00 =     718.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    117.00 TO NODE    117.00 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.) =    7.96
 RAINFALL INTENSITY(INCH/HR) =   6.44
 TOTAL STREAM AREA(ACRES) =     1.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.95

****************************************************************************
 FLOW PROCESS FROM NODE    116.00 TO NODE    118.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
 UPSTREAM ELEVATION(FEET) =    774.00
 DOWNSTREAM ELEVATION(FEET) =    755.00
 ELEVATION DIFFERENCE(FEET) =     19.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.195
 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) =  7.572
 SUBAREA RUNOFF(CFS) =      0.55
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    120.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  755.00  DOWNSTREAM ELEVATION(FEET) =  740.00
 STREET LENGTH(FEET) =   450.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.54
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.22
   HALFSTREET FLOOD WIDTH(FEET) =    4.92
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.52
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.79
 STREET FLOW TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =    8.33
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.257
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    1.32      SUBAREA RUNOFF(CFS) =    3.96
```

TOTAL AREA(ACRES) = 1.5 PEAK FLOW RATE(CFS) = 4.41

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.26 HALFSTREET FLOOD WIDTH(FEET) = 6.70
FLOW VELOCITY(FEET/SEC.) = 3.89 DEPTH*VELOCITY(FT*FT/SEC.) = 1.01
LONGEST FLOWPATH FROM NODE 116.00 TO NODE 120.00 = 775.00 FEET.

****
FLOW PROCESS FROM NODE 120.00 TO NODE 117.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 736.00 DOWNSTREAM(FEET) = 732.00
FLOW LENGTH(FEET) = 10.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 20.94
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.41
PIPE TRAVEL TIME(MIN.) = 0.01 Tc(MIN.) = 8.34
LONGEST FLOWPATH FROM NODE 116.00 TO NODE 117.00 = 785.00 FEET.

****
FLOW PROCESS FROM NODE 117.00 TO NODE 117.00 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.) = 8.34
RAINFALL INTENSITY(INCH/HR) = 6.25
TOTAL STREAM AREA(ACRES) = 1.47
PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.41

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	4.95	7.96	6.441	1.60
2	4.41	8.34	6.253	1.47

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	9.17	7.96	6.441
2	9.22	8.34	6.253

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 9.22 Tc(MIN.) = 8.34
TOTAL AREA(ACRES) = 3.1
LONGEST FLOWPATH FROM NODE 116.00 TO NODE 117.00 = 785.00 FEET.

****
FLOW PROCESS FROM NODE 117.00 TO NODE 127.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 732.00 DOWNSTREAM(FEET) = 672.00
FLOW LENGTH(FEET) = 365.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.89

ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 9.22
PIPE TRAVEL TIME(MIN.) = 0.32 Tc(MIN.) = 8.66
LONGEST FLOWPATH FROM NODE 116.00 TO NODE 127.00 = 1150.00 FEET.

****
FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 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.) = 8.66
RAINFALL INTENSITY(INCH/HR) = 6.10
TOTAL STREAM AREA(ACRES) = 3.07
PEAK FLOW RATE(CFS) AT CONFLUENCE = 9.22

****
FLOW PROCESS FROM NODE 122.00 TO NODE 124.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) = 85
INITIAL SUBAREA FLOW-LENGTH(FEET) = 0.15
UPSTREAM ELEVATION(FEET) = 779.00
DOWNSTREAM ELEVATION(FEET) = 770.00
ELEVATION DIFFERENCE(FEET) = 9.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 0.259
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.695
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 0.39
TOTAL AREA(ACRES) = 0.15 TOTAL RUNOFF(CFS) = 0.39

****
FLOW PROCESS FROM NODE 124.00 TO NODE 126.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 2 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) = 770.00 DOWNSTREAM ELEVATION(FEET) = 675.00
STREET LENGTH(FEET) = 1153.00 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) = 23.65
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.36
HALFSTREET FLOOD WIDTH(FEET) = 11.63
AVERAGE FLOW VELOCITY(FEET/SEC.) = 8.04
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.88
STREET FLOW TRAVEL TIME(MIN.) = 2.39 Tc(MIN.) = 2.65
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.695
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5000
S.C.S. CURVE NUMBER (AMC II) = 85

```
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.497
 SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =   46.52
 TOTAL AREA(ACRES) =       10.8        PEAK FLOW RATE(CFS) =      46.91

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.00
 FLOW VELOCITY(FEET/SEC.) =  9.57   DEPTH*VELOCITY(FT*FT/SEC.) =   4.13
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    126.00 =    1153.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    126.00 TO NODE    127.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   673.00  DOWNSTREAM(FEET) =   672.00
 FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.78
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      46.91
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    2.67
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    127.00 =    1178.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    2.67
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =    10.85
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     46.91

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        9.22     8.66        6.102          3.07
     2       46.91     2.67        8.695         10.85

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       53.38     2.67       8.695
     2       42.14     8.66       6.102

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      53.38   Tc(MIN.) =    2.67
 TOTAL AREA(ACRES) =       13.9
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    127.00 =    1178.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    127.00 TO NODE    139.00 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) =   633.00
 FLOW LENGTH(FEET) =   375.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  24.85
```



```
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      53.38
 PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    2.93
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    139.00 =    1553.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    139.00 TO NODE    139.00 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.) =    2.93
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =    13.92
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     53.38

****************************************************************************
 FLOW PROCESS FROM NODE    128.00 TO NODE    128.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
 UPSTREAM ELEVATION(FEET) =    675.00
 DOWNSTREAM ELEVATION(FEET) =    660.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.142
 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) =  7.614
 SUBAREA RUNOFF(CFS) =      0.55
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    132.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  660.00  DOWNSTREAM ELEVATION(FEET) =  637.00
 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) =       4.55
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.25
   HALFSTREET FLOOD WIDTH(FEET) =    6.14
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
 STREET FLOW TRAVEL TIME(MIN.) =   1.74   Tc(MIN.) =    7.88
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.482
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
```

```
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    2.57      SUBAREA RUNOFF(CFS) =    8.00
 TOTAL AREA(ACRES) =        2.7        PEAK FLOW RATE(CFS) =       8.46

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.35
 FLOW VELOCITY(FEET/SEC.) =  5.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.52
 LONGEST FLOWPATH FROM NODE    128.00 TO NODE    132.00 =     730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    132.00 TO NODE    139.00 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) =   633.00
 FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.31
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.46
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    7.93
 LONGEST FLOWPATH FROM NODE    128.00 TO NODE    139.00 =     760.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    139.00 TO NODE    139.00 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.) =    7.93
 RAINFALL INTENSITY(INCH/HR) =   6.46
 TOTAL STREAM AREA(ACRES) =     2.72
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.46

****************************************************************************
 FLOW PROCESS FROM NODE    134.00 TO NODE    136.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
 UPSTREAM ELEVATION(FEET) =    675.00
 DOWNSTREAM ELEVATION(FEET) =    652.00
 ELEVATION DIFFERENCE(FEET) =     23.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.431
 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) =  8.243
 SUBAREA RUNOFF(CFS) =      0.59
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
 FLOW PROCESS FROM NODE    136.00 TO NODE    138.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  652.00  DOWNSTREAM ELEVATION(FEET) =  637.00
 STREET LENGTH(FEET) =   375.00   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) =       3.64
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.24
   HALFSTREET FLOOD WIDTH(FEET) =    5.77
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.98
 STREET FLOW TRAVEL TIME(MIN.) =   1.55   Tc(MIN.) =    6.98
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.012
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    1.80      SUBAREA RUNOFF(CFS) =    6.06
 TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       6.56

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.76
 FLOW VELOCITY(FEET/SEC.) =  4.55   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
 LONGEST FLOWPATH FROM NODE    134.00 TO NODE    138.00 =     640.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    138.00 TO NODE    139.00 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) =   633.00
 FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.37
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.56
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    6.99
 LONGEST FLOWPATH FROM NODE    134.00 TO NODE    139.00 =     650.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    139.00 TO NODE    139.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.99
 RAINFALL INTENSITY(INCH/HR) =   7.00
 TOTAL STREAM AREA(ACRES) =     1.95
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.56

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       53.38     2.93        8.695         13.92
     2        8.46     7.93        6.456          2.72
     3        6.56     6.99        7.005          1.95
```

```
 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       59.25     2.93       8.695
     2       57.03     6.99       7.005
     3       54.15     7.93       6.456

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      59.25   Tc(MIN.) =    2.93
 TOTAL AREA(ACRES) =       18.6
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    139.00 =    1553.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    139.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   633.00  DOWNSTREAM(FEET) =   598.00
 FLOW LENGTH(FEET) =   550.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.17
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      59.25
 PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    3.36
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    152.00 =    2103.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 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.) =    3.36
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =    18.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     59.25

****************************************************************************
 FLOW PROCESS FROM NODE    140.00 TO NODE    142.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
 UPSTREAM ELEVATION(FEET) =    638.00
 DOWNSTREAM ELEVATION(FEET) =    636.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.337
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    70.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.812
 SUBAREA RUNOFF(CFS) =      0.42
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
 FLOW PROCESS FROM NODE    142.00 TO NODE    146.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```



```
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  636.00  DOWNSTREAM ELEVATION(FEET) =  602.00
 STREET LENGTH(FEET) =   745.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.64
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.27
   HALFSTREET FLOOD WIDTH(FEET) =    6.98
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
 STREET FLOW TRAVEL TIME(MIN.) =   2.67   Tc(MIN.) =   12.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.942
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    4.39      SUBAREA RUNOFF(CFS) =   10.41
 TOTAL AREA(ACRES) =        4.5         PEAK FLOW RATE(CFS) =      10.77

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.40
 FLOW VELOCITY(FEET/SEC.) =  5.37   DEPTH*VELOCITY(FT*FT/SEC.) =   1.69
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    146.00 =     945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    146.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   599.00  DOWNSTREAM(FEET) =   598.00
 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   9.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.73
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.77
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   12.04
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    152.00 =     970.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.04
 RAINFALL INTENSITY(INCH/HR) =   4.93
 TOTAL STREAM AREA(ACRES) =     4.54
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.77

****************************************************************************
 FLOW PROCESS FROM NODE    146.00 TO NODE    148.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =    673.00
  DOWNSTREAM ELEVATION(FEET) =    670.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.443
  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) =  6.201
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.45

**************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    150.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  670.00  DOWNSTREAM ELEVATION(FEET) =  602.00
  STREET LENGTH(FEET) =   260.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.16
    HALFSTREET FLOOD WIDTH(FEET) =    1.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   11.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.74
  STREET FLOW TRAVEL TIME(MIN.) =   0.39   Tc(MIN.) =    8.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.024
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
  SUBAREA AREA(ACRES) =    1.47      SUBAREA RUNOFF(CFS) =    4.25
  TOTAL AREA(ACRES) =       1.6        PEAK FLOW RATE(CFS) =       4.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   3.61
  FLOW VELOCITY(FEET/SEC.) =  9.43   DEPTH*VELOCITY(FT*FT/SEC.) =   1.87
  LONGEST FLOWPATH FROM NODE    146.00 TO NODE    150.00 =     460.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    152.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   599.00  DOWNSTREAM(FEET) =   598.00
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.05
```



```
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.68
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    8.85
  LONGEST FLOWPATH FROM NODE    146.00 TO NODE    152.00 =     470.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 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.) =    8.85
  RAINFALL INTENSITY(INCH/HR) =   6.02
  TOTAL STREAM AREA(ACRES) =     1.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.68

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       59.25     3.36        8.695         18.59
      2       10.77    12.04        4.933          4.54
      3        4.68     8.85        6.018          1.62

  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       64.03     3.36       8.695
      2       53.61     8.85       6.018
      3       48.23    12.04       4.933

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      64.03   Tc(MIN.) =    3.36
  TOTAL AREA(ACRES) =       24.8
  LONGEST FLOWPATH FROM NODE    122.00 TO NODE    152.00 =    2103.15 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    199.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   598.00  DOWNSTREAM(FEET) =   583.00
  FLOW LENGTH(FEET) =   690.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.34
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.03
  PIPE TRAVEL TIME(MIN.) =   0.80    Tc(MIN.) =    4.16
  LONGEST FLOWPATH FROM NODE    122.00 TO NODE    199.00 =    2793.15 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    199.00 IS CODE =  10
--------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    156.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
```

```
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
 UPSTREAM ELEVATION(FEET) =    638.00
 DOWNSTREAM ELEVATION(FEET) =    636.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.466
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    62.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.761
 SUBAREA RUNOFF(CFS) =      0.41
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
 FLOW PROCESS FROM NODE    156.00 TO NODE    158.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  636.00  DOWNSTREAM ELEVATION(FEET) =  606.00
 STREET LENGTH(FEET) =   950.00   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) =       7.02
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.30
   HALFSTREET FLOOD WIDTH(FEET) =    8.47
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.20
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
 STREET FLOW TRAVEL TIME(MIN.) =   3.77   Tc(MIN.) =   13.23
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.641
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    5.88      SUBAREA RUNOFF(CFS) =   13.10
 TOTAL AREA(ACRES) =        6.0        PEAK FLOW RATE(CFS) =      13.43

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.22
 FLOW VELOCITY(FEET/SEC.) =  4.88   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    158.00 =    1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    158.00 TO NODE    164.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   603.00  DOWNSTREAM(FEET) =   597.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.68
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      13.43
```



```
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   13.28
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    164.00 =    1250.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 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.) =   13.28
 RAINFALL INTENSITY(INCH/HR) =   4.63
 TOTAL STREAM AREA(ACRES) =     6.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.43

****************************************************************************
 FLOW PROCESS FROM NODE    160.00 TO NODE    162.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   145.00
 UPSTREAM ELEVATION(FEET) =    607.00
 DOWNSTREAM ELEVATION(FEET) =    605.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.612
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    73.79
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.123
 SUBAREA RUNOFF(CFS) =      0.44
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
 FLOW PROCESS FROM NODE    162.00 TO NODE    164.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  607.00  DOWNSTREAM ELEVATION(FEET) =  605.00
 STREET LENGTH(FEET) =    50.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.13
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.21
   HALFSTREET FLOOD WIDTH(FEET) =    4.08
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
 STREET FLOW TRAVEL TIME(MIN.) =   0.22   Tc(MIN.) =    8.83
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.023
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.532
```

```
 SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    3.38
 TOTAL AREA(ACRES) =        1.2        PEAK FLOW RATE(CFS) =       3.82

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   5.95
 FLOW VELOCITY(FEET/SEC.) =  4.04   DEPTH*VELOCITY(FT*FT/SEC.) =   0.99
 LONGEST FLOWPATH FROM NODE    160.00 TO NODE    164.00 =     195.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 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.) =    8.83
 RAINFALL INTENSITY(INCH/HR) =   6.02
 TOTAL STREAM AREA(ACRES) =     1.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.82

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       13.43    13.28        4.631          6.03
     2        3.82     8.83        6.023          1.19

 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       12.75     8.83       6.023
     2       16.37    13.28       4.631

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      16.37   Tc(MIN.) =   13.28
 TOTAL AREA(ACRES) =        7.2
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    164.00 =    1250.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    164.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   597.00  DOWNSTREAM(FEET) =   593.00
 FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.80
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      16.37
 PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   13.79
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    172.00 =    1520.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    172.00 TO NODE    172.00 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.) =   13.79
 RAINFALL INTENSITY(INCH/HR) =   4.52
 TOTAL STREAM AREA(ACRES) =     7.22
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.37
```



```
****************************************************************************
 FLOW PROCESS FROM NODE    166.00 TO NODE    168.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   165.00
 UPSTREAM ELEVATION(FEET) =    609.00
 DOWNSTREAM ELEVATION(FEET) =    606.00
 ELEVATION DIFFERENCE(FEET) =      3.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.085
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    78.18
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.377
 SUBAREA RUNOFF(CFS) =      0.46
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
 FLOW PROCESS FROM NODE    168.00 TO NODE    170.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  606.00  DOWNSTREAM ELEVATION(FEET) =  600.00
 STREET LENGTH(FEET) =   250.00   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) =       1.52
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    3.80
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.59
 STREET FLOW TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =    9.52
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.738
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    0.77      SUBAREA RUNOFF(CFS) =    2.12
 TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       2.53

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   5.39
 FLOW VELOCITY(FEET/SEC.) =  3.10   DEPTH*VELOCITY(FT*FT/SEC.) =   0.73
 LONGEST FLOWPATH FROM NODE    166.00 TO NODE    170.00 =     415.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    170.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   597.00  DOWNSTREAM(FEET) =   593.00
 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   5.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.16
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.53
 PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   10.07
 LONGEST FLOWPATH FROM NODE    166.00 TO NODE    172.00 =     615.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    172.00 TO NODE    172.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.07
 RAINFALL INTENSITY(INCH/HR) =   5.54
 TOTAL STREAM AREA(ACRES) =     0.92
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.53

****************************************************************************
 FLOW PROCESS FROM NODE    174.00 TO NODE    176.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    604.00
 DOWNSTREAM ELEVATION(FEET) =    602.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.923
 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) =  6.461
 SUBAREA RUNOFF(CFS) =      0.47
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
 FLOW PROCESS FROM NODE    176.00 TO NODE    178.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  602.00  DOWNSTREAM ELEVATION(FEET) =  598.00
 STREET LENGTH(FEET) =   200.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.45
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.24
   HALFSTREET FLOOD WIDTH(FEET) =    5.58
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.86
```



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   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.68
 STREET FLOW TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =    9.09
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.913
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    1.40      SUBAREA RUNOFF(CFS) =    3.97
 TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       4.40

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.59
 FLOW VELOCITY(FEET/SEC.) =  3.17   DEPTH*VELOCITY(FT*FT/SEC.) =   0.88
 LONGEST FLOWPATH FROM NODE    174.00 TO NODE    178.00 =     300.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    178.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   595.00  DOWNSTREAM(FEET) =   593.00
 FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.36
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.40
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    9.10
 LONGEST FLOWPATH FROM NODE    174.00 TO NODE    172.00 =     310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    172.00 TO NODE    172.00 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.) =    9.10
 RAINFALL INTENSITY(INCH/HR) =   5.91
 TOTAL STREAM AREA(ACRES) =     1.55
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.40

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       16.37    13.79        4.520          7.22
     2        2.53    10.07        5.537          0.92
     3        4.40     9.10        5.909          1.55

 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       19.21     9.10       5.909
     2       20.02    10.07       5.537
     3       21.80    13.79       4.520

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      21.80   Tc(MIN.) =   13.79
 TOTAL AREA(ACRES) =       9.7
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    172.00 =    1520.00 FEET.

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

```
 FLOW PROCESS FROM NODE    172.00 TO NODE    180.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   593.00  DOWNSTREAM(FEET) =   592.00
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.48
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      21.80
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   13.85
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    180.00 =    1560.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    180.00 TO NODE    199.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   591.00  DOWNSTREAM(FEET) =   583.00
 FLOW LENGTH(FEET) =   930.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.78
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      21.80
 PIPE TRAVEL TIME(MIN.) =   1.99    Tc(MIN.) =   15.84
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    199.00 =    2490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    180.00 TO NODE    199.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    182.00 TO NODE    184.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 UPSTREAM ELEVATION(FEET) =    602.00
 DOWNSTREAM ELEVATION(FEET) =    600.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.683
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    73.33
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.090
 SUBAREA RUNOFF(CFS) =      0.44
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
 FLOW PROCESS FROM NODE    184.00 TO NODE    190.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  600.00  DOWNSTREAM ELEVATION(FEET) =  593.00
 STREET LENGTH(FEET) =   300.00   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) =       3.95
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.26
   HALFSTREET FLOOD WIDTH(FEET) =    6.89
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.88
 STREET FLOW TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =   10.18
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.495
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    2.66      SUBAREA RUNOFF(CFS) =    7.02
 TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =       7.41

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.29
 FLOW VELOCITY(FEET/SEC.) =  3.78   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
 LONGEST FLOWPATH FROM NODE    182.00 TO NODE    190.00 =     450.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    190.00 TO NODE    190.00 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.) =   10.18
 RAINFALL INTENSITY(INCH/HR) =   5.49
 TOTAL STREAM AREA(ACRES) =     2.81
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.41

****************************************************************************
 FLOW PROCESS FROM NODE    186.00 TO NODE    188.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 UPSTREAM ELEVATION(FEET) =    602.00
 DOWNSTREAM ELEVATION(FEET) =    600.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.683
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    73.33
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.090
 SUBAREA RUNOFF(CFS) =      0.44
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
 FLOW PROCESS FROM NODE    188.00 TO NODE    190.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
```

```
 UPSTREAM ELEVATION(FEET) =  600.00  DOWNSTREAM ELEVATION(FEET) =  593.00
 STREET LENGTH(FEET) =   300.00   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) =       3.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.26
   HALFSTREET FLOOD WIDTH(FEET) =    6.80
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.87
 STREET FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   10.20
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.491
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    2.57      SUBAREA RUNOFF(CFS) =    6.77
 TOTAL AREA(ACRES) =        2.7        PEAK FLOW RATE(CFS) =       7.17

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.11
 FLOW VELOCITY(FEET/SEC.) =  3.78   DEPTH*VELOCITY(FT*FT/SEC.) =   1.17
 LONGEST FLOWPATH FROM NODE    186.00 TO NODE    190.00 =     450.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    190.00 TO NODE    190.00 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.) =   10.20
 RAINFALL INTENSITY(INCH/HR) =   5.49
 TOTAL STREAM AREA(ACRES) =     2.72
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.17

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        7.41    10.18        5.495          2.81
     2        7.17    10.20        5.491          2.72

 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       14.57    10.18       5.495
     2       14.57    10.20       5.491

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      14.57   Tc(MIN.) =   10.20
 TOTAL AREA(ACRES) =       5.5
 LONGEST FLOWPATH FROM NODE    182.00 TO NODE    190.00 =     450.00 FEET.

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



```
 FLOW PROCESS FROM NODE    190.00 TO NODE    199.00 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       14.57    10.20       5.491         5.53
 LONGEST FLOWPATH FROM NODE    182.00 TO NODE    199.00 =     450.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       21.80    15.84       4.133         9.69
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    199.00 =    2490.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      28.61      10.20        5.491
     2      32.77      15.84        4.133

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      32.77   Tc(MIN.) =   15.84
 TOTAL AREA(ACRES) =       15.2

****************************************************************************
 FLOW PROCESS FROM NODE    190.00 TO NODE    199.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    190.00 TO NODE    199.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    194.00 TO NODE    196.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 UPSTREAM ELEVATION(FEET) =    602.00
 DOWNSTREAM ELEVATION(FEET) =    600.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.683
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    73.33
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.090
 SUBAREA RUNOFF(CFS) =      0.44
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
 FLOW PROCESS FROM NODE    196.00 TO NODE    198.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  600.00  DOWNSTREAM ELEVATION(FEET) =  593.00
```

```
 STREET LENGTH(FEET) =   326.00   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) =       3.49
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.26
   HALFSTREET FLOOD WIDTH(FEET) =    6.61
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
 STREET FLOW TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =   10.41
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.417
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    2.34      SUBAREA RUNOFF(CFS) =    6.08
 TOTAL AREA(ACRES) =        2.5        PEAK FLOW RATE(CFS) =       6.47

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.88
 FLOW VELOCITY(FEET/SEC.) =  3.57   DEPTH*VELOCITY(FT*FT/SEC.) =   1.09
 LONGEST FLOWPATH FROM NODE    194.00 TO NODE    198.00 =     476.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    198.00 TO NODE    198.00 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.) =   10.41
 RAINFALL INTENSITY(INCH/HR) =   5.42
 TOTAL STREAM AREA(ACRES) =     2.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.47

****************************************************************************
 FLOW PROCESS FROM NODE    192.00 TO NODE    198.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  601.00  DOWNSTREAM ELEVATION(FEET) =  593.00
 STREET LENGTH(FEET) =   650.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.91
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.33
   HALFSTREET FLOOD WIDTH(FEET) =   10.34
```



```
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
 STREET FLOW TRAVEL TIME(MIN.) =   3.72   Tc(MIN.) =   14.14
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.448
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 SUBAREA AREA(ACRES) =    0.41      SUBAREA RUNOFF(CFS) =    0.88
 TOTAL AREA(ACRES) =        2.9        PEAK FLOW RATE(CFS) =       6.47

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.05
 FLOW VELOCITY(FEET/SEC.) =  2.87   DEPTH*VELOCITY(FT*FT/SEC.) =   0.94
 LONGEST FLOWPATH FROM NODE    186.00 TO NODE    198.00 =    1100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    198.00 TO NODE    198.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.14
 RAINFALL INTENSITY(INCH/HR) =   4.45
 TOTAL STREAM AREA(ACRES) =     2.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.47

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        6.47    10.41        5.417          2.49
     2        6.47    14.14        4.448          2.90

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       11.24    10.41       5.417
     2       11.79    14.14       4.448

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.79   Tc(MIN.) =   14.14
 TOTAL AREA(ACRES) =        5.4
 LONGEST FLOWPATH FROM NODE    186.00 TO NODE    198.00 =    1100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    198.00 TO NODE    199.00 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       11.79    14.14       4.448        5.39
 LONGEST FLOWPATH FROM NODE    186.00 TO NODE    199.00 =    1100.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       32.77    15.84       4.133       15.22
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    199.00 =    2490.00 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      41.04      14.14        4.448
     2      43.73      15.84        4.133

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      43.73   Tc(MIN.) =   15.84
 TOTAL AREA(ACRES) =       20.6

****************************************************************************
 FLOW PROCESS FROM NODE    198.00 TO NODE    199.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    199.00 TO NODE    199.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       43.73    15.84       4.133       20.61
 LONGEST FLOWPATH FROM NODE    154.00 TO NODE    199.00 =    2490.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       64.03     4.16       8.695       24.75
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    199.00 =    2793.15 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      75.52       4.16        8.695
     2      74.17      15.84        4.133

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      75.52   Tc(MIN.) =    4.16
 TOTAL AREA(ACRES) =       45.4

****************************************************************************
 FLOW PROCESS FROM NODE    199.00 TO NODE    199.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| THE FOLLOWING CODE 7 IS THE ATTENUATED FLOW FROM COMBO BASIN 1           |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    199.00 TO NODE    199.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   5.00   RAIN INTENSITY(INCH/HOUR) =  8.69
 TOTAL AREA(ACRES) =    45.40   TOTAL RUNOFF(CFS) =     14.36

****************************************************************************
 FLOW PROCESS FROM NODE    199.00 TO NODE    119.00 IS CODE =  31
```



```
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   580.00  DOWNSTREAM(FEET) =   579.00
 FLOW LENGTH(FEET) =    58.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.14
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      14.36
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    5.11
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    119.00 =    2851.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    119.00 TO NODE    119.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| BEGIN FLOWS FROM AGRI-AMMENITIES AND TRAIL                               |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    113.00 TO NODE    115.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   168.00
 UPSTREAM ELEVATION(FEET) =    760.00
 DOWNSTREAM ELEVATION(FEET) =    748.00
 ELEVATION DIFFERENCE(FEET) =     12.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.478
 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) =  6.707
 SUBAREA RUNOFF(CFS) =      0.30
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
 FLOW PROCESS FROM NODE    115.00 TO NODE    127.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    748.00  DOWNSTREAM(FEET) =    598.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2361.00   CHANNEL SLOPE =  0.0635
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.30
 FLOW VELOCITY(FEET/SEC) =   3.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  10.41   Tc(MIN.) =   17.89
 LONGEST FLOWPATH FROM NODE    113.00 TO NODE    127.00 =    2529.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    115.00 TO NODE    127.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.821
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =    9.20   SUBAREA RUNOFF(CFS) =   10.55
  TOTAL AREA(ACRES) =        9.3   TOTAL RUNOFF(CFS) =      10.72
  TC(MIN.) =   17.89

****************************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    117.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.89
  RAINFALL INTENSITY(INCH/HR) =   3.82
  TOTAL STREAM AREA(ACRES) =     9.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.72

+--------------------------------------------------------------------------+
| THE FOLLOWING CODE 7 IS TAKEN FROM NODE 127 IN EXISTING CONDITIONS       |
| HYDROLOGY.                                                               |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  11.24   RAIN INTENSITY(INCH/HOUR) =  5.16
  TOTAL AREA(ACRES) =    46.00   TOTAL RUNOFF(CFS) =    128.04

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 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.) =   11.24
  RAINFALL INTENSITY(INCH/HR) =   5.16
  TOTAL STREAM AREA(ACRES) =    46.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    128.04

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.72    17.89        3.821          9.35
      2      128.04    11.24        5.156         46.00

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1      134.78    11.24        5.156
      2      105.61    17.89        3.821

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     134.78   Tc(MIN.) =   11.24
  TOTAL AREA(ACRES) =       55.3
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    127.00 =    2529.00 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    119.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   598.00  DOWNSTREAM(FEET) =   579.00
  FLOW LENGTH(FEET) =   610.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.48
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     134.78
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =   11.76
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    119.00 =    3139.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    119.00 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      134.78    11.76        5.008        55.35
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    119.00 =    3139.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       14.36     5.11        8.578        45.40
  LONGEST FLOWPATH FROM NODE    122.00 TO NODE    119.00 =    2851.15 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      72.87       5.11        8.578
      2     143.16      11.76        5.008

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     143.16   Tc(MIN.) =   11.76
  TOTAL AREA(ACRES) =      100.8

****************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    119.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   579.00  DOWNSTREAM(FEET) =   575.00
  FLOW LENGTH(FEET) =   457.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  38.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.33
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     143.16
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =   12.38
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    100.00 =    3596.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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      143.16    12.38       4.845      100.75
  LONGEST FLOWPATH FROM NODE    113.00 TO NODE    100.00 =    3596.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      109.99    13.86       4.505       58.92
  LONGEST FLOWPATH FROM NODE     58.00 TO NODE    100.00 =    4748.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     241.41      12.38       4.845
      2     243.10      13.86       4.505

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     243.10   Tc(MIN.) =   13.86
  TOTAL AREA(ACRES) =      159.7

********************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

+------------------------------------------------------------------------------+
| BEGIN 200 SERIES ONSITE                                                      |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    204.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
  UPSTREAM ELEVATION(FEET) =    776.00
  DOWNSTREAM ELEVATION(FEET) =    750.00
  ELEVATION DIFFERENCE(FEET) =     26.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.789
  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) =  7.911
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.50

********************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    206.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  750.00  DOWNSTREAM ELEVATION(FEET) =  718.00
  STREET LENGTH(FEET) =   540.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.19
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.34
  STREET FLOW TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =    7.52
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.681
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
  SUBAREA AREA(ACRES) =    3.74      SUBAREA RUNOFF(CFS) =   10.49
  TOTAL AREA(ACRES) =        3.9        PEAK FLOW RATE(CFS) =      10.92

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   8.94
  FLOW VELOCITY(FEET/SEC.) =  5.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.82
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    206.00 =     815.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    214.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   714.00  DOWNSTREAM(FEET) =   710.00
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.58
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.92
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    7.55
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    214.00 =     844.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 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.) =    7.55
  RAINFALL INTENSITY(INCH/HR) =   6.67
  TOTAL STREAM AREA(ACRES) =     3.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.92

********************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    211.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
```

```
  UPSTREAM ELEVATION(FEET) =    776.00
  DOWNSTREAM ELEVATION(FEET) =    750.00
  ELEVATION DIFFERENCE(FEET) =     26.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.789
  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) =  7.911
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    213.10 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  750.00  DOWNSTREAM ELEVATION(FEET) =  718.00
  STREET LENGTH(FEET) =   560.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.21
    HALFSTREET FLOOD WIDTH(FEET) =    4.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
  STREET FLOW TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =    7.91
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.469
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
  SUBAREA AREA(ACRES) =    1.52      SUBAREA RUNOFF(CFS) =    4.13
  TOTAL AREA(ACRES) =        1.7        PEAK FLOW RATE(CFS) =       4.54

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.86
  FLOW VELOCITY(FEET/SEC.) =  4.92   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE    209.00 TO NODE    213.10 =     835.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    213.10 TO NODE    214.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   714.00  DOWNSTREAM(FEET) =   710.00
  FLOW LENGTH(FEET) =     5.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        4.54
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    7.91
  LONGEST FLOWPATH FROM NODE    209.00 TO NODE    214.00 =     840.00 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 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.) =    7.91
  RAINFALL INTENSITY(INCH/HR) =   6.47
  TOTAL STREAM AREA(ACRES) =     1.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.54

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.92     7.55        6.666          3.89
      2        4.54     7.91        6.467          1.67

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.24     7.55       6.666
      2       15.13     7.91       6.467

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.24   Tc(MIN.) =    7.55
  TOTAL AREA(ACRES) =       5.6
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    214.00 =     844.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.10 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) =   706.00
  FLOW LENGTH(FEET) =   153.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.63
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.24
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    7.79
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    214.10 =     997.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.10 TO NODE    214.10 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.) =    7.79
  RAINFALL INTENSITY(INCH/HR) =   6.53
  TOTAL STREAM AREA(ACRES) =     5.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.24

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    224.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
```

```
 S.C.S. CURVE NUMBER (AMC II) =  79
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   215.00
 UPSTREAM ELEVATION(FEET) =    750.00
 DOWNSTREAM ELEVATION(FEET) =    725.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.682
 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) =  8.007
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE    224.00 TO NODE    226.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  725.00  DOWNSTREAM ELEVATION(FEET) =  694.00
 STREET LENGTH(FEET) =   600.00   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) =       3.09
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.22
   HALFSTREET FLOOD WIDTH(FEET) =    4.83
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.98
 STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =    7.96
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.444
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
 SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    5.14
 TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       5.55

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.70
 FLOW VELOCITY(FEET/SEC.) =  4.89   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
 LONGEST FLOWPATH FROM NODE    222.00 TO NODE    226.00 =     815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    226.00 TO NODE    214.10 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   707.00  DOWNSTREAM(FEET) =   706.00
 FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.09
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.55
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    7.98
```



```
 LONGEST FLOWPATH FROM NODE    222.00 TO NODE    214.10 =     833.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    214.10 TO NODE    214.10 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.) =    7.98
 RAINFALL INTENSITY(INCH/HR) =   6.43
 TOTAL STREAM AREA(ACRES) =     2.05
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.55

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       15.24     7.79        6.533          5.56
     2        5.55     7.98        6.430          2.05

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       20.66     7.79       6.533
     2       20.55     7.98       6.430

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      20.66   Tc(MIN.) =    7.79
 TOTAL AREA(ACRES) =        7.6
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    214.10 =     997.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    214.10 TO NODE    220.00 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) =   704.00
 FLOW LENGTH(FEET) =    12.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.59
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      20.66
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    7.80
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    220.00 =    1009.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 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.) =    7.80
 RAINFALL INTENSITY(INCH/HR) =   6.53
 TOTAL STREAM AREA(ACRES) =     7.61
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.66

****************************************************************************
 FLOW PROCESS FROM NODE    216.00 TO NODE    218.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =    750.00
  DOWNSTREAM ELEVATION(FEET) =    727.00
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.842
  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) =  7.864
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    220.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  727.00  DOWNSTREAM ELEVATION(FEET) =  706.00
  STREET LENGTH(FEET) =   610.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

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

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
  STREET FLOW TRAVEL TIME(MIN.) =   2.36   Tc(MIN.) =    8.20
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.317
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
  SUBAREA AREA(ACRES) =    2.13      SUBAREA RUNOFF(CFS) =    5.65
  TOTAL AREA(ACRES) =        2.3        PEAK FLOW RATE(CFS) =       6.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.52
  FLOW VELOCITY(FEET/SEC.) =  4.94   DEPTH*VELOCITY(FT*FT/SEC.) =   1.66
  LONGEST FLOWPATH FROM NODE    216.00 TO NODE    220.00 =     860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 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.) =    8.20
  RAINFALL INTENSITY(INCH/HR) =   6.32
  TOTAL STREAM AREA(ACRES) =     2.28
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.05

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.66     7.80        6.528          7.61
      2        6.05     8.20        6.317          2.28

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.41     7.80       6.528
      2       26.04     8.20       6.317

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.41   Tc(MIN.) =    7.80
  TOTAL AREA(ACRES) =        9.9
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    220.00 =    1009.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    201.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   704.00  DOWNSTREAM(FEET) =   675.00
  FLOW LENGTH(FEET) =   262.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.29
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.41
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    8.00
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    201.00 =    1271.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 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.) =    8.00
  RAINFALL INTENSITY(INCH/HR) =   6.42
  TOTAL STREAM AREA(ACRES) =     9.89
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.41

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    223.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   106.00
  UPSTREAM ELEVATION(FEET) =    719.00
  DOWNSTREAM ELEVATION(FEET) =    718.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   12.084
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    67.74
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.921
```

```
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    220.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    718.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   394.00   CHANNEL SLOPE =  0.1091
  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) =       0.22
  FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   13.47
  LONGEST FLOWPATH FROM NODE    221.00 TO NODE    220.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.589
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =    2.45   SUBAREA RUNOFF(CFS) =    3.37
  TOTAL AREA(ACRES) =        2.6   TOTAL RUNOFF(CFS) =       3.58
  TC(MIN.) =   13.47

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    201.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.47
  RAINFALL INTENSITY(INCH/HR) =   4.59
  TOTAL STREAM AREA(ACRES) =     2.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.58

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       26.41     8.00        6.420          9.89
      2        3.58    13.47        4.589          2.60

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       28.53     8.00       6.420
      2       22.45    13.47       4.589

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      28.53   Tc(MIN.) =    8.00
  TOTAL AREA(ACRES) =       12.5
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    201.00 =    1271.00 FEET.

+--------------------------------------------------------------------------+
| THE FOLLOWING CODE 7 IS THE ATTENUATED FLOW PROVIDED BY BASIN 3          |
```



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

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   8.00   RAIN INTENSITY(INCH/HOUR) =  6.42
  TOTAL AREA(ACRES) =    12.50   TOTAL RUNOFF(CFS) =     15.63

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    208.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    663.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   106.00   CHANNEL SLOPE =  0.1604
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      15.63
  FLOW VELOCITY(FEET/SEC) =   8.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.20   Tc(MIN.) =    8.20
  LONGEST FLOWPATH FROM NODE    202.00 TO NODE    208.00 =    1377.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.20
  RAINFALL INTENSITY(INCH/HR) =   6.32
  TOTAL STREAM AREA(ACRES) =    12.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.63

+--------------------------------------------------------------------------+
| BEGIN FLOWS FROM VILLAMOURA DRIVE                                        |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    207.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   129.00
  UPSTREAM ELEVATION(FEET) =    680.00
  DOWNSTREAM ELEVATION(FEET) =    675.80
  ELEVATION DIFFERENCE(FEET) =      4.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.259
  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) =  6.290
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.40

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

```
 FLOW PROCESS FROM NODE    207.00 TO NODE    208.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  675.00  DOWNSTREAM ELEVATION(FEET) =  663.00
 STREET LENGTH(FEET) =   181.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.50
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    3.80
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96
 STREET FLOW TRAVEL TIME(MIN.) =   0.63   Tc(MIN.) =    8.89
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.998
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
 SUBAREA AREA(ACRES) =    1.67      SUBAREA RUNOFF(CFS) =    4.21
 TOTAL AREA(ACRES) =        1.8        PEAK FLOW RATE(CFS) =       4.58

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.67
 FLOW VELOCITY(FEET/SEC.) =  5.21   DEPTH*VELOCITY(FT*FT/SEC.) =   1.25
 LONGEST FLOWPATH FROM NODE    205.00 TO NODE    208.00 =     310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.89
 RAINFALL INTENSITY(INCH/HR) =   6.00
 TOTAL STREAM AREA(ACRES) =     1.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.58

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       15.63     8.20        6.320         12.50
     2        4.58     8.89        5.998          1.82

 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       19.86     8.20       6.320
     2       19.42     8.89       5.998

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```



```
 PEAK FLOW RATE(CFS) =      19.86   Tc(MIN.) =    8.20
 TOTAL AREA(ACRES) =       14.3
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    208.00 =    1377.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    208.00 TO NODE    200.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  663.00  DOWNSTREAM ELEVATION(FEET) =  647.00
 STREET LENGTH(FEET) =   350.00   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) =      30.45
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.42
   HALFSTREET FLOOD WIDTH(FEET) =   14.50
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.85
 STREET FLOW TRAVEL TIME(MIN.) =   0.85   Tc(MIN.) =    9.05
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.930
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.324
 SUBAREA AREA(ACRES) =    6.64      SUBAREA RUNOFF(CFS) =   21.26
 TOTAL AREA(ACRES) =       21.0        PEAK FLOW RATE(CFS) =      40.23

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  15.00
 FLOW VELOCITY(FEET/SEC.) =  7.53   DEPTH*VELOCITY(FT*FT/SEC.) =   3.36
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =    1727.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 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.) =    9.05
 RAINFALL INTENSITY(INCH/HR) =   5.93
 TOTAL STREAM AREA(ACRES) =    20.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.23

****************************************************************************
 FLOW PROCESS FROM NODE    210.00 TO NODE    212.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   190.00
 UPSTREAM ELEVATION(FEET) =    745.00
 DOWNSTREAM ELEVATION(FEET) =    735.00
 ELEVATION DIFFERENCE(FEET) =     10.00
```

```
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.795
 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) =  7.905
 SUBAREA RUNOFF(CFS) =      0.68
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.68

****************************************************************************
 FLOW PROCESS FROM NODE    212.00 TO NODE    200.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  735.00  DOWNSTREAM ELEVATION(FEET) =  646.00
 STREET LENGTH(FEET) =   800.00   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) =      33.23
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.38
   HALFSTREET FLOOD WIDTH(FEET) =   12.57
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.70
 STREET FLOW TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =    7.16
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.899
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  84
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
 SUBAREA AREA(ACRES) =   17.40      SUBAREA RUNOFF(CFS) =   64.82
 TOTAL AREA(ACRES) =       17.6        PEAK FLOW RATE(CFS) =      65.42

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  15.00
 FLOW VELOCITY(FEET/SEC.) = 12.00   DEPTH*VELOCITY(FT*FT/SEC.) =   5.40
 LONGEST FLOWPATH FROM NODE    210.00 TO NODE    200.00 =     990.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 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.) =    7.16
 RAINFALL INTENSITY(INCH/HR) =   6.90
 TOTAL STREAM AREA(ACRES) =    17.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     65.42

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       40.23     9.05        5.930         20.96
     2       65.42     7.16        6.899         17.56
```



```
 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      100.00     7.16        6.899
     2       96.46     9.05        5.930

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     100.00   Tc(MIN.) =    7.16
 TOTAL AREA(ACRES) =       38.5
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =    1727.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| BEGIN 300 SERIES ONSITE                                                  |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    304.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
 UPSTREAM ELEVATION(FEET) =    700.00
 DOWNSTREAM ELEVATION(FEET) =    695.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.501
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    76.43
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.747
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE    304.00 TO NODE    306.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  695.00  DOWNSTREAM ELEVATION(FEET) =  670.00
 STREET LENGTH(FEET) =   600.00   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) =       1.05
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.16
    HALFSTREET FLOOD WIDTH(FEET) =    1.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
  STREET FLOW TRAVEL TIME(MIN.) =   2.25   Tc(MIN.) =   11.75
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.010
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    1.37
  TOTAL AREA(ACRES) =        0.8        PEAK FLOW RATE(CFS) =       1.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.19   HALFSTREET FLOOD WIDTH(FEET) =   3.23
  FLOW VELOCITY(FEET/SEC.) =  3.78   DEPTH*VELOCITY(FT*FT/SEC.) =   0.72
  LONGEST FLOWPATH FROM NODE    302.00 TO NODE    306.00 =     950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    301.00 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) =   662.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.38
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.68
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   11.87
  LONGEST FLOWPATH FROM NODE    302.00 TO NODE    301.00 =    1010.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 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.) =   11.87
  RAINFALL INTENSITY(INCH/HR) =   4.98
  TOTAL STREAM AREA(ACRES) =     0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.68

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    310.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    713.00
  DOWNSTREAM ELEVATION(FEET) =    695.00
  ELEVATION DIFFERENCE(FEET) =     18.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.682
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.007
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    312.00 IS CODE =  62
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  695.00  DOWNSTREAM ELEVATION(FEET) =  666.00
  STREET LENGTH(FEET) =   650.00   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) =       8.73
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.51
  STREET FLOW TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =    7.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.511
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
  SUBAREA AREA(ACRES) =    5.96      SUBAREA RUNOFF(CFS) =   16.30
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      16.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  11.40
  FLOW VELOCITY(FEET/SEC.) =  5.90   DEPTH*VELOCITY(FT*FT/SEC.) =   2.09
  LONGEST FLOWPATH FROM NODE    308.00 TO NODE    312.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    301.00 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) =   662.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.71
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    7.96
  LONGEST FLOWPATH FROM NODE    308.00 TO NODE    301.00 =     850.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 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.) =    7.96
  RAINFALL INTENSITY(INCH/HR) =   6.44
  TOTAL STREAM AREA(ACRES) =     6.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.71

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

Q100

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)	(ACRE)
1	1.68	11.87	4.978	0.80
2	16.71	7.96	6.442	6.11

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	17.84	7.96	6.442
2	14.59	11.87	4.978

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 17.84 Tc(MIN.) = 7.96
TOTAL AREA(ACRES) = 6.9
LONGEST FLOWPATH FROM NODE 302.00 TO NODE 301.00 = 1010.00 FEET.

THE FOLLOWIN CODE 7 IS THE ATTENUATED FLOW PROVIDED BY BASIN 4

FLOW PROCESS FROM NODE 301.00 TO NODE 301.00 IS CODE = 7
>>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 8.00 RAIN INTENSITY(INCH/HOUR) = 6.42
TOTAL AREA(ACRES) = 6.90 TOTAL RUNOFF(CFS) = 5.59

FLOW PROCESS FROM NODE 301.00 TO NODE 305.10 IS CODE = 31
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
ELEVATION DATA: UPSTREAM(FEET) = 669.00 DOWNSTREAM(FEET) = 661.00
FLOW LENGTH(FEET) = 52.49 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.) = 15.95
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.59
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 8.05
LONGEST FLOWPATH FROM NODE 302.00 TO NODE 305.10 = 1062.49 FEET.

FLOW PROCESS FROM NODE 305.10 TO NODE 305.10 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.) = 8.05
RAINFALL INTENSITY(INCH/HR) = 6.39
TOTAL STREAM AREA(ACRES) = 6.90
PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.59

THE FOLLOWING CODE 7 IS TAKEN FROM THE EXISTING CONDITION MODEL.
THIS CODE 7 CONTAINS FLOWS FROM THE SUBDIVISION ALONG TOM O'SHANTER DR

FLOW PROCESS FROM NODE 217.00 TO NODE 217.00 IS CODE = 7
>>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 10.88 RAIN INTENSITY(INCH/HOUR) = 5.27
TOTAL AREA(ACRES) = 29.20 TOTAL RUNOFF(CFS) = 83.02

FLOW PROCESS FROM NODE 217.00 TO NODE 305.10 IS CODE = 31
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
ELEVATION DATA: UPSTREAM(FEET) = 665.00 DOWNSTREAM(FEET) = 661.00
FLOW LENGTH(FEET) = 393.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.52
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 83.02
PIPE TRAVEL TIME(MIN.) = 0.57 Tc(MIN.) = 11.45
LONGEST FLOWPATH FROM NODE 308.00 TO NODE 305.10 = 1243.00 FEET.

FLOW PROCESS FROM NODE 305.10 TO NODE 305.10 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.) = 11.45
RAINFALL INTENSITY(INCH/HR) = 5.10
TOTAL STREAM AREA(ACRES) = 29.20
PEAK FLOW RATE(CFS) AT CONFLUENCE = 83.02

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	5.59	8.05	6.393	6.90
2	83.02	11.45	5.096	29.20

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	64.00	8.05	6.393
2	87.48	11.45	5.096

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 87.48 Tc(MIN.) = 11.45
TOTAL AREA(ACRES) = 36.1
LONGEST FLOWPATH FROM NODE 308.00 TO NODE 305.10 = 1243.00 FEET.

FLOW PROCESS FROM NODE 305.10 TO NODE 305.00 IS CODE = 31
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
ELEVATION DATA: UPSTREAM(FEET) = 601.00 DOWNSTREAM(FEET) = 600.00
FLOW LENGTH(FEET) = 65.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 39.0 INCH PIPE IS 28.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 13.57

```
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      87.48
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   11.53
 LONGEST FLOWPATH FROM NODE    308.00 TO NODE    305.00 =    1308.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 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.) =   11.53
 RAINFALL INTENSITY(INCH/HR) =   5.07
 TOTAL STREAM AREA(ACRES) =    36.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     87.48

****************************************************************************
 FLOW PROCESS FROM NODE    303.00 TO NODE    303.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   136.00
 UPSTREAM ELEVATION(FEET) =    725.00
 DOWNSTREAM ELEVATION(FEET) =    715.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.406
 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) =  6.749
 SUBAREA RUNOFF(CFS) =      0.30
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
 FLOW PROCESS FROM NODE    303.10 TO NODE    305.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    715.00  DOWNSTREAM(FEET) =    660.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   875.00   CHANNEL SLOPE =  0.0629
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.30
 FLOW VELOCITY(FEET/SEC) =   3.76 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.88   Tc(MIN.) =   11.28
 LONGEST FLOWPATH FROM NODE    303.00 TO NODE    305.00 =    1011.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    303.10 TO NODE    305.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.143
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    3.45   SUBAREA RUNOFF(CFS) =    5.32
 TOTAL AREA(ACRES) =       3.6   TOTAL RUNOFF(CFS) =      5.55
 TC(MIN.) =   11.28

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



```
 FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 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.) =   11.28
 RAINFALL INTENSITY(INCH/HR) =   5.14
 TOTAL STREAM AREA(ACRES) =     3.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.55

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       87.48    11.53        5.073         36.10
     2        5.55    11.28        5.143          3.60

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       91.83    11.28       5.143
     2       92.95    11.53       5.073

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      92.95   Tc(MIN.) =   11.53
 TOTAL AREA(ACRES) =       39.7
 LONGEST FLOWPATH FROM NODE    308.00 TO NODE    305.00 =    1308.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    305.00 TO NODE    200.00 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) =   645.00
 FLOW LENGTH(FEET) =  1200.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.79
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      92.95
 PIPE TRAVEL TIME(MIN.) =   1.56    Tc(MIN.) =   13.09
 LONGEST FLOWPATH FROM NODE    308.00 TO NODE    200.00 =    2508.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    305.00 TO NODE    200.00 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       92.95    13.09       4.673       39.70
 LONGEST FLOWPATH FROM NODE    308.00 TO NODE    200.00 =    2508.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      100.00     7.16       6.899       38.52
 LONGEST FLOWPATH FROM NODE    202.00 TO NODE    200.00 =    1727.00 FEET.

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

```
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     150.81       7.16        6.899
      2     160.69      13.09        4.673

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     160.69   Tc(MIN.) =   13.09
  TOTAL AREA(ACRES) =       78.2

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    200.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    300.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    645.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   278.00   CHANNEL SLOPE =  0.0719
  CHANNEL FLOW THRU SUBAREA(CFS) =     160.69
  FLOW VELOCITY(FEET/SEC) =  14.70 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.32   Tc(MIN.) =   13.41
  LONGEST FLOWPATH FROM NODE    308.00 TO NODE    300.00 =    2786.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =   13.41
  RAINFALL INTENSITY(INCH/HR) =   4.60
  TOTAL STREAM AREA(ACRES) =    78.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    160.69

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    316.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =    675.00
  DOWNSTREAM ELEVATION(FEET) =    660.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.037
  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) =  6.975
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    300.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    660.00  DOWNSTREAM(FEET) =    625.00
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   658.00   CHANNEL SLOPE =  0.0532
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.31
  FLOW VELOCITY(FEET/SEC) =   3.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =   10.21
  LONGEST FLOWPATH FROM NODE    314.00 TO NODE    300.00 =     833.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.487
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =    7.28   SUBAREA RUNOFF(CFS) =   11.98
  TOTAL AREA(ACRES) =       7.4   TOTAL RUNOFF(CFS) =      12.23
  TC(MIN.) =   10.21

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =   10.21
  RAINFALL INTENSITY(INCH/HR) =   5.49
  TOTAL STREAM AREA(ACRES) =     7.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      160.69    13.41        4.602         78.22
      2       12.23    10.21        5.487          7.43

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      134.56    10.21       5.487
      2      170.95    13.41       4.602

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     170.95   Tc(MIN.) =   13.41
  TOTAL AREA(ACRES) =       85.7
  LONGEST FLOWPATH FROM NODE    308.00 TO NODE    300.00 =    2786.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+----------------------------------------------------------------------------+
| BEGIN 500 SERIES ONSITE                                                    |
| TRIBUTARY TO BASIN 6                                                       |
|                                                                            |
+----------------------------------------------------------------------------+

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

```
 FLOW PROCESS FROM NODE    502.00 TO NODE    504.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   145.00
 UPSTREAM ELEVATION(FEET) =    741.00
 DOWNSTREAM ELEVATION(FEET) =    734.00
 ELEVATION DIFFERENCE(FEET) =      7.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.243
 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) =  6.846
 SUBAREA RUNOFF(CFS) =      0.43
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
 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) =  734.00  DOWNSTREAM ELEVATION(FEET) =  690.00
 STREET LENGTH(FEET) =   985.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 15.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0130

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.11
   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.) =   3.47   Tc(MIN.) =   10.71
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.318
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.420
 SUBAREA AREA(ACRES) =    5.04      SUBAREA RUNOFF(CFS) =   11.26
 TOTAL AREA(ACRES) =        5.2        PEAK FLOW RATE(CFS) =      11.59

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.76
 FLOW VELOCITY(FEET/SEC.) =  5.42   DEPTH*VELOCITY(FT*FT/SEC.) =   1.74
 LONGEST FLOWPATH FROM NODE    502.00 TO NODE    506.00 =    1130.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    506.00 TO NODE    500.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   686.00  DOWNSTREAM(FEET) =   658.00
 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   4.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  39.99
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.59
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   10.72
 LONGEST FLOWPATH FROM NODE    502.00 TO NODE    500.00 =    1155.00 FEET.

+----------------------------------------------------------------------------+
| THE FOLLOWING CODE 7 IS THE ATTENUATED FLOW PROVIDED BY BASIN 6           |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  11.00   RAIN INTENSITY(INCH/HOUR) =  5.23
 TOTAL AREA(ACRES) =     5.20   TOTAL RUNOFF(CFS) =      4.20

****************************************************************************
 FLOW PROCESS FROM NODE    500.00 TO NODE    300.00 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) =   625.00
 FLOW LENGTH(FEET) =   792.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.25
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.20
 PIPE TRAVEL TIME(MIN.) =   1.43    Tc(MIN.) =   12.43
 LONGEST FLOWPATH FROM NODE    502.00 TO NODE    300.00 =    1947.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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         4.20    12.43        4.833        5.20
 LONGEST FLOWPATH FROM NODE    502.00 TO NODE    300.00 =    1947.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       170.95    13.41        4.602       85.65
 LONGEST FLOWPATH FROM NODE    308.00 TO NODE    300.00 =    2786.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1     162.65      12.43        4.833
    2     174.95      13.41        4.602

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     174.95   Tc(MIN.) =   13.41
 TOTAL AREA(ACRES) =       90.8
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  12
--------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
==========================================================================

+------------------------------------------------------------------------+
| BEGIN 400 SERIES ONSITE                                                |
| TRIBUTARY TO BASIN 5                                                   |
|                                                                        |
+------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    404.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   195.00
  UPSTREAM ELEVATION(FEET) =    745.00
  DOWNSTREAM ELEVATION(FEET) =    725.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.679
  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) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.70

**************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    400.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  725.00  DOWNSTREAM ELEVATION(FEET) =  683.00
  STREET LENGTH(FEET) =   542.00   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) =      12.21
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.05
  STREET FLOW TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =    6.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.713
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  84
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  SUBAREA AREA(ACRES) =    5.50      SUBAREA RUNOFF(CFS) =   22.91
  TOTAL AREA(ACRES) =        5.7        PEAK FLOW RATE(CFS) =      23.53
```



```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.75
  FLOW VELOCITY(FEET/SEC.) =  7.85   DEPTH*VELOCITY(FT*FT/SEC.) =   2.84
  LONGEST FLOWPATH FROM NODE    402.00 TO NODE    400.00 =     737.00 FEET.

+------------------------------------------------------------------------+
| THE FOLLOWING IS THE ATTENUATED FLOW PROVIDED BY BASIN 5               |
|                                                                        |
|                                                                        |
+------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 IS CODE =   7
--------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
==========================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   6.00   RAIN INTENSITY(INCH/HOUR) =  7.73
  TOTAL AREA(ACRES) =     5.70   TOTAL RUNOFF(CFS) =      7.13
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        5.7  TC(MIN.) =      6.00
  PEAK FLOW RATE(CFS)   =       7.13
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix 2 – Soils Information

Hydrologic Soil Group—San Diego County Area, California
(THE FARM)



Map Scale: 1:10,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 13, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 3, 2010—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
ClG2	Cieneba coarse sandy loam, 30 to 65 percent slopes, eroded	D	4.3	3.1%
FaB	Fallbrook sandy loam, 2 to 5 percent slopes	C	2.8	2.0%
FaC2	Fallbrook sandy loam, 5 to 9 percent slopes, eroded	C	1.1	0.8%
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded	C	47.5	34.0%
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes, eroded	C	52.9	37.8%
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	22.3	15.9%
VvD	Vista rocky coarse sandy loam, 5 to 15 percent slopes	B	8.3	5.9%
VvE	Vista rocky coarse sandy loam, 15 to 30 percent slopes	B	0.7	0.5%
Totals for Area of Interest			**139.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix 3- Hydraulic calculations for Proposed Basin/Outlet Structures

	Basin 1	Basin 2	Basin 3	Basin 4	Basin 5	Basin 6
Total Basin Depth (ft)	5	5	5	5	5	5
Maximum Water Surface Elevation (ft)	2.15	2.17	2.28	3.25	3.29	2.87
Freeboard (ft)	2.85	2.83	2.72	1.75	1.71	2.13
Bottom Orifice Diameter (in)	2	2	2	2	2	2
Number of Orifices	2	2	2	2	2	2
Bottom Orifice Invert	0.5	0.5	0.5	0.5	0.5	0.5
Middle Orifice Diameter (ft)	-	-	-	-	-	-
Number of Orifices	-	-	-	-	-	-
Middle orifice Invert	-	-	-	-	-	-
Top Orifice Diameter (in)	4	4	4	4	4	4
Number of Orifices	12	12	12	12	12	12
Top Orifice Diameter (ft)	2	2	2	2	2	2
Weir Length (ft)	10	10	10	10	10	10
Weir Invert (ft)	3.5	4	3.5	3.5	4	4

The outlet structures allow the peak flow rate to pass through the basin without overtopping the basin. The outlet structure provides at least one foot of freeboard.

Appendix 4- Basin Attenuation Calculations

BASIN 1

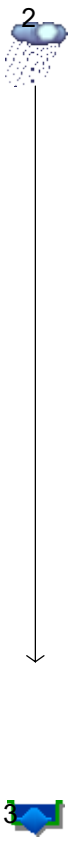
RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 3/29/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 45.4 ACRES
RUNOFF COEFFICIENT 0.48
PEAK DISCHARGE 75.52 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 4.3
TIME (MIN) = 10	DISCHARGE (CFS) = 4.3
TIME (MIN) = 15	DISCHARGE (CFS) = 4.4
TIME (MIN) = 20	DISCHARGE (CFS) = 4.4
TIME (MIN) = 25	DISCHARGE (CFS) = 4.5
TIME (MIN) = 30	DISCHARGE (CFS) = 4.6
TIME (MIN) = 35	DISCHARGE (CFS) = 4.7
TIME (MIN) = 40	DISCHARGE (CFS) = 4.7
TIME (MIN) = 45	DISCHARGE (CFS) = 4.8
TIME (MIN) = 50	DISCHARGE (CFS) = 4.9
TIME (MIN) = 55	DISCHARGE (CFS) = 5
TIME (MIN) = 60	DISCHARGE (CFS) = 5
TIME (MIN) = 65	DISCHARGE (CFS) = 5.2
TIME (MIN) = 70	DISCHARGE (CFS) = 5.2
TIME (MIN) = 75	DISCHARGE (CFS) = 5.4
TIME (MIN) = 80	DISCHARGE (CFS) = 5.4
TIME (MIN) = 85	DISCHARGE (CFS) = 5.6
TIME (MIN) = 90	DISCHARGE (CFS) = 5.7
TIME (MIN) = 95	DISCHARGE (CFS) = 5.8
TIME (MIN) = 100	DISCHARGE (CFS) = 5.9
TIME (MIN) = 105	DISCHARGE (CFS) = 6.1
TIME (MIN) = 110	DISCHARGE (CFS) = 6.2
TIME (MIN) = 115	DISCHARGE (CFS) = 6.4
TIME (MIN) = 120	DISCHARGE (CFS) = 6.5
TIME (MIN) = 125	DISCHARGE (CFS) = 6.7
TIME (MIN) = 130	DISCHARGE (CFS) = 6.9
TIME (MIN) = 135	DISCHARGE (CFS) = 7.1
TIME (MIN) = 140	DISCHARGE (CFS) = 7.3
TIME (MIN) = 145	DISCHARGE (CFS) = 7.6
TIME (MIN) = 150	DISCHARGE (CFS) = 7.8
TIME (MIN) = 155	DISCHARGE (CFS) = 8.1
TIME (MIN) = 160	DISCHARGE (CFS) = 8.3
TIME (MIN) = 165	DISCHARGE (CFS) = 8.8
TIME (MIN) = 170	DISCHARGE (CFS) = 9
TIME (MIN) = 175	DISCHARGE (CFS) = 9.6
TIME (MIN) = 180	DISCHARGE (CFS) = 9.9
TIME (MIN) = 185	DISCHARGE (CFS) = 10.6
TIME (MIN) = 190	DISCHARGE (CFS) = 11
TIME (MIN) = 195	DISCHARGE (CFS) = 12
TIME (MIN) = 200	DISCHARGE (CFS) = 12.6
TIME (MIN) = 205	DISCHARGE (CFS) = 13.9
TIME (MIN) = 210	DISCHARGE (CFS) = 14.8
TIME (MIN) = 215	DISCHARGE (CFS) = 16.9
TIME (MIN) = 220	DISCHARGE (CFS) = 18.4
TIME (MIN) = 225	DISCHARGE (CFS) = 22.4
TIME (MIN) = 230	DISCHARGE (CFS) = 25.6
TIME (MIN) = 235	DISCHARGE (CFS) = 37.5
TIME (MIN) = 240	DISCHARGE (CFS) = 66.8
TIME (MIN) = 245	DISCHARGE (CFS) = 75.52
TIME (MIN) = 250	DISCHARGE (CFS) = 30.1
TIME (MIN) = 255	DISCHARGE (CFS) = 20.1
TIME (MIN) = 260	DISCHARGE (CFS) = 15.8
TIME (MIN) = 265	DISCHARGE (CFS) = 13.2
TIME (MIN) = 270	DISCHARGE (CFS) = 11.5
TIME (MIN) = 275	DISCHARGE (CFS) = 10.2
TIME (MIN) = 280	DISCHARGE (CFS) = 9.3
TIME (MIN) = 285	DISCHARGE (CFS) = 8.5
TIME (MIN) = 290	DISCHARGE (CFS) = 7.9
TIME (MIN) = 295	DISCHARGE (CFS) = 7.4
TIME (MIN) = 300	DISCHARGE (CFS) = 7
TIME (MIN) = 305	DISCHARGE (CFS) = 6.6
TIME (MIN) = 310	DISCHARGE (CFS) = 6.3
TIME (MIN) = 315	DISCHARGE (CFS) = 6
TIME (MIN) = 320	DISCHARGE (CFS) = 5.7
TIME (MIN) = 325	DISCHARGE (CFS) = 5.5

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
2	Manual	------	-------	-------	-------	-------	-------	-------	-------	75.52	BASIN 1 Q100
3	Reservoir	2	-------	-------	-------	-------	-------	-------	-------	14.36	BASIN 1 ATTENUATED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

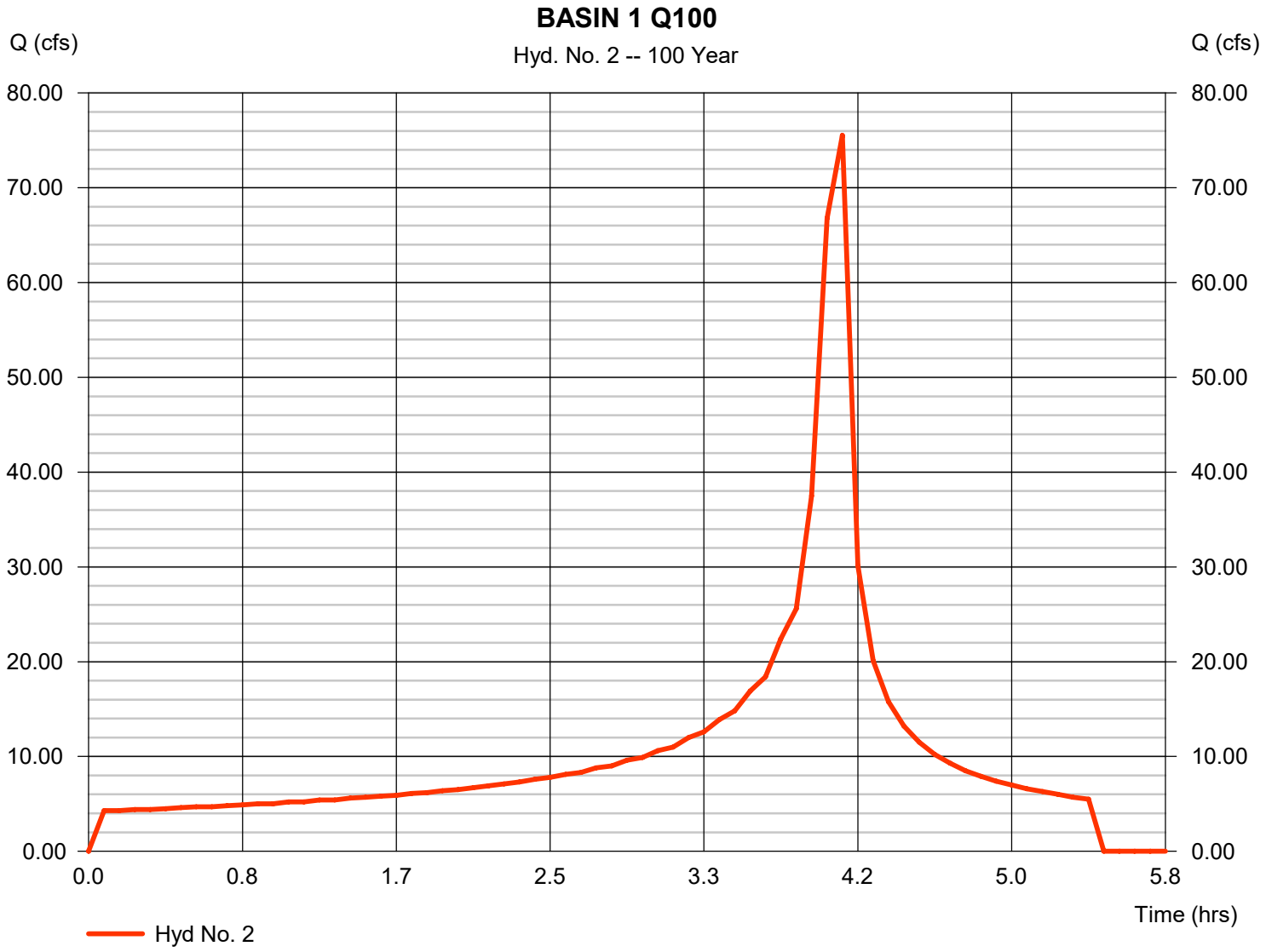
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	Manual	75.52	5	245	219,366	------	------	------	BASIN 1 Q100
3	Reservoir	14.36	5	265	219,201	2	102.15	164,869	BASIN 1 ATTENUATED

Hydrograph Report

Hyd. No. 2

BASIN 1 Q100

Hydrograph type	= Manual	Peak discharge	= 75.52 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 5 min	Hyd. volume	= 219,366 cuft



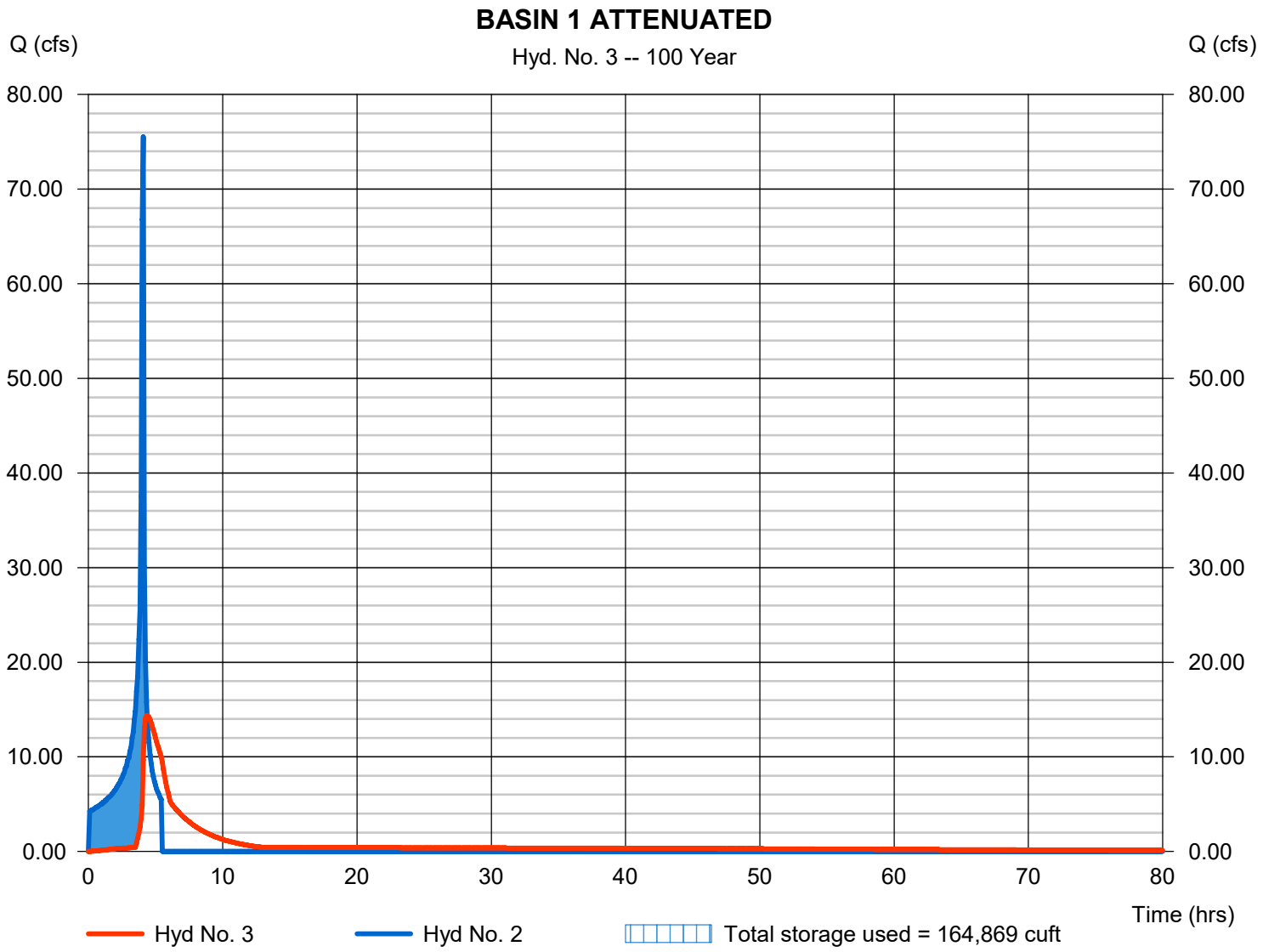
Hydrograph Report

Hyd. No. 3

BASIN 1 ATTENUATED

Hydrograph type	=	Reservoir	Peak discharge	=	14.36 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.42 hrs
Time interval	=	5 min	Hyd. volume	=	219,201 cuft
Inflow hyd. No.	=	2 - BASIN 1 Q100	Max. Elevation	=	102.15 ft
Reservoir name	=	BASIN 1	Max. Storage	=	164,869 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - BASIN 1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	38,616	0	0
1.00	100.50	42,053	40,335	40,335
2.00	101.00	45,601	43,827	84,162
3.00	101.50	49,263	47,432	131,594
4.00	102.00	53,038	51,151	182,744
4.10	102.50	53,427	5,323	188,067
4.15	103.00	53,621	2,676	190,744
4.20	104.50	53,816	2,686	193,429
4.25	104.00	54,010	2,696	196,125
4.30	104.50	54,204	2,705	198,830
4.35	105.00	54,399	2,715	201,545
4.40	104.30	54,593	2,725	204,270
4.45	104.40	54,788	2,735	207,005
4.50	104.50	54,982	2,744	209,749
4.55	104.60	55,176	2,754	212,503
4.65	104.70	55,565	5,537	218,040
4.70	104.80	55,760	2,783	220,823
4.75	104.85	56,343	2,803	223,626
4.80	104.90	56,148	2,812	226,438
4.90	104.95	56,537	5,634	232,072
5.00	105.00	56,926	5,673	237,745

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

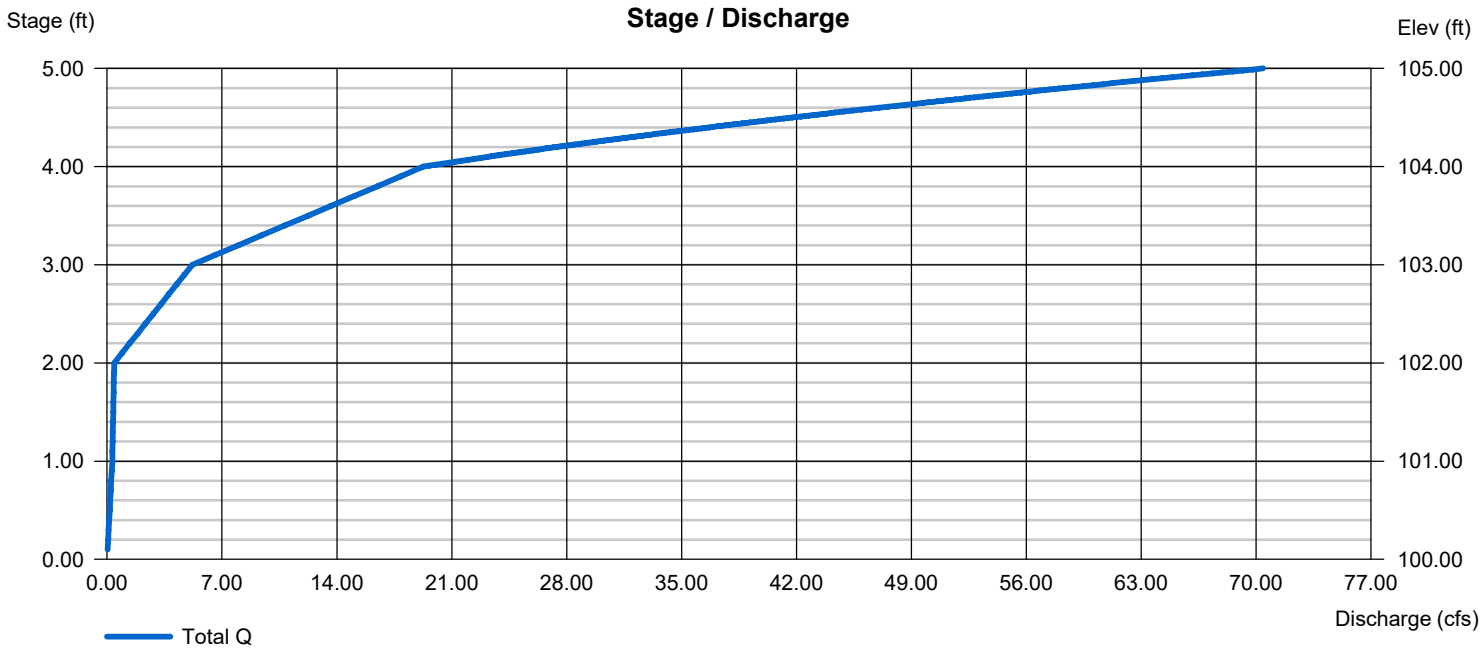
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

RATIONAL METHOD HYDROGRAPH PROGRAM
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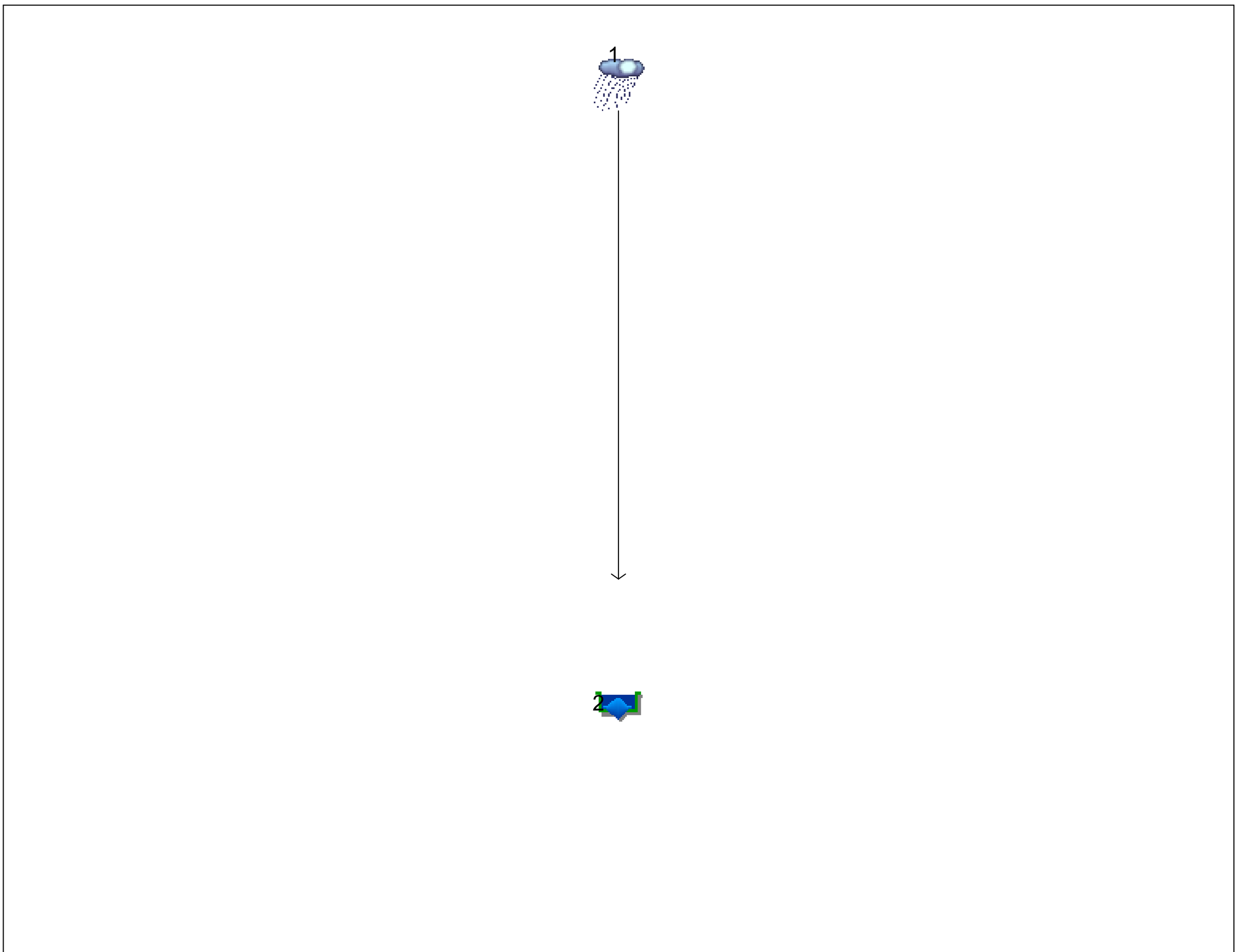
BASIN 2

RUN DATE 3/29/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 11 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 14.4 ACRES
RUNOFF COEFFICIENT 0.43
PEAK DISCHARGE 37.2 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 11	DISCHARGE (CFS) = 1.2
TIME (MIN) = 22	DISCHARGE (CFS) = 1.2
TIME (MIN) = 33	DISCHARGE (CFS) = 1.3
TIME (MIN) = 44	DISCHARGE (CFS) = 1.3
TIME (MIN) = 55	DISCHARGE (CFS) = 1.4
TIME (MIN) = 66	DISCHARGE (CFS) = 1.4
TIME (MIN) = 77	DISCHARGE (CFS) = 1.5
TIME (MIN) = 88	DISCHARGE (CFS) = 1.5
TIME (MIN) = 99	DISCHARGE (CFS) = 1.6
TIME (MIN) = 110	DISCHARGE (CFS) = 1.7
TIME (MIN) = 121	DISCHARGE (CFS) = 1.8
TIME (MIN) = 132	DISCHARGE (CFS) = 1.9
TIME (MIN) = 143	DISCHARGE (CFS) = 2
TIME (MIN) = 154	DISCHARGE (CFS) = 2.1
TIME (MIN) = 165	DISCHARGE (CFS) = 2.4
TIME (MIN) = 176	DISCHARGE (CFS) = 2.5
TIME (MIN) = 187	DISCHARGE (CFS) = 2.9
TIME (MIN) = 198	DISCHARGE (CFS) = 3.1
TIME (MIN) = 209	DISCHARGE (CFS) = 3.8
TIME (MIN) = 220	DISCHARGE (CFS) = 4.4
TIME (MIN) = 231	DISCHARGE (CFS) = 6.4
TIME (MIN) = 242	DISCHARGE (CFS) = 4.2
TIME (MIN) = 253	DISCHARGE (CFS) = 37.2
TIME (MIN) = 264	DISCHARGE (CFS) = 5.1
TIME (MIN) = 275	DISCHARGE (CFS) = 3.4
TIME (MIN) = 286	DISCHARGE (CFS) = 2.7
TIME (MIN) = 297	DISCHARGE (CFS) = 2.3
TIME (MIN) = 308	DISCHARGE (CFS) = 2
TIME (MIN) = 319	DISCHARGE (CFS) = 1.8
TIME (MIN) = 330	DISCHARGE (CFS) = 1.6
TIME (MIN) = 341	DISCHARGE (CFS) = 1.5
TIME (MIN) = 352	DISCHARGE (CFS) = 1.4
TIME (MIN) = 363	DISCHARGE (CFS) = 1.3
TIME (MIN) = 374	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	37.20	BASIN 2 Q100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	6.752	BASIN 2 ATTENUATED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

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	37.20	11	253	73,854	------	------	------	BASIN 2 Q100
2	Reservoir	6.752	11	264	73,816	1	102.17	50,116	BASIN 2 ATTENUATED

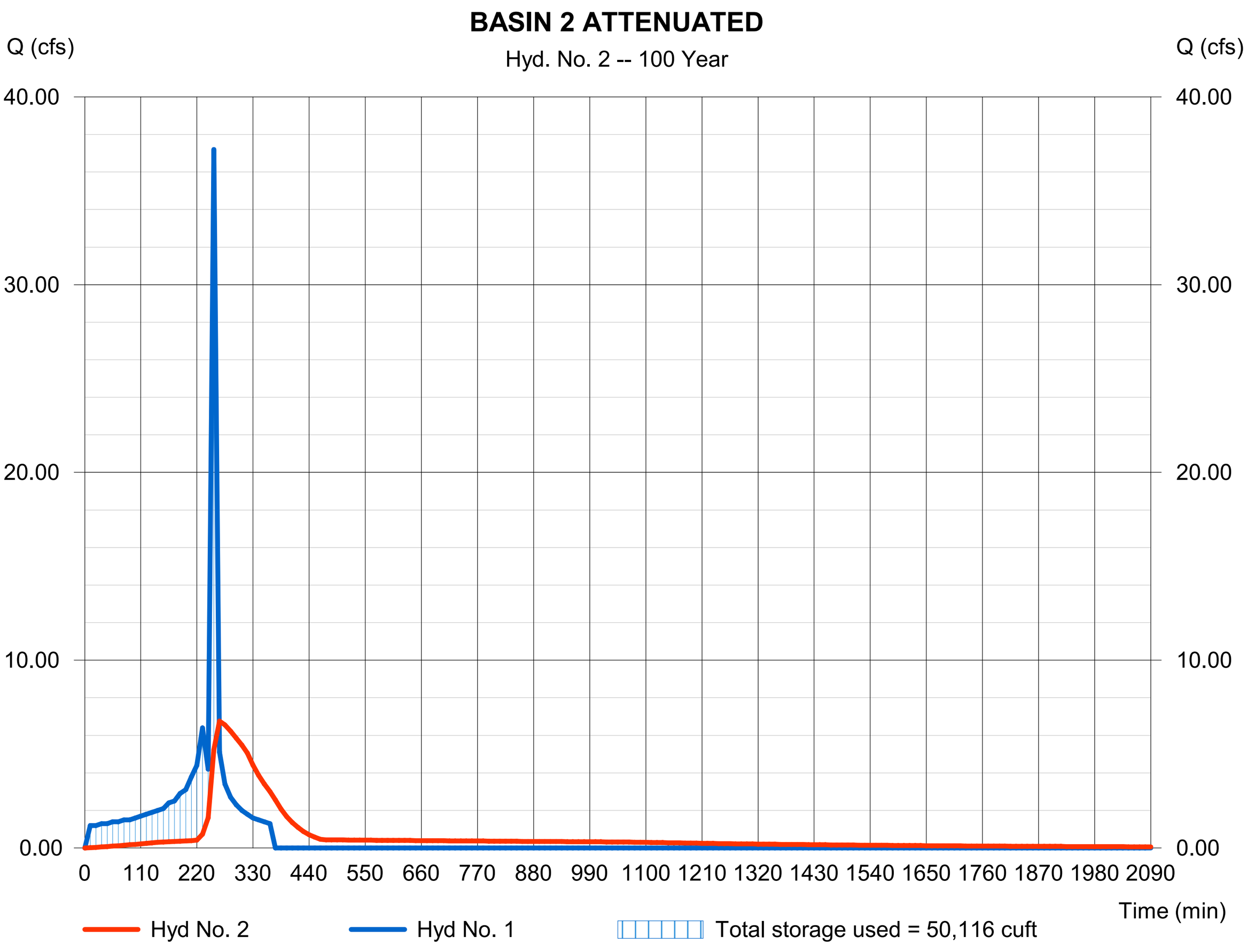
Hydrograph Report

Hyd. No. 2

BASIN 2 ATTENUATED

Hydrograph type	=	Reservoir	Peak discharge	=	6.752 cfs
Storm frequency	=	100 yrs	Time to peak	=	264 min
Time interval	=	11 min	Hyd. volume	=	73,816 cuft
Inflow hyd. No.	=	1 - BASIN 2 Q100	Max. Elevation	=	102.17 ft
Reservoir name	=	BASIN 2	Max. Storage	=	50,116 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Monday, 09 / 23 / 2019

Pond No. 1 - BASIN 2

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	11,076	0	0
1.00	100.50	12,517	11,797	11,797
2.00	101.00	14,010	13,264	25,060
3.00	101.50	15,552	14,781	39,841
3.50	102.00	16,340	7,973	47,814
4.00	102.50	17,128	8,367	56,181
4.10	103.00	17,290	1,721	57,902
4.20	103.25	17,453	1,737	59,639
4.30	103.50	17,615	1,753	61,392
4.40	103.75	17,777	1,770	63,162
4.50	104.00	17,940	1,786	64,948
4.55	104.10	18,021	899	65,847
4.60	104.20	18,102	903	66,750
4.65	104.30	18,183	907	67,657
4.70	104.40	18,264	911	68,568
4.75	104.50	18,345	915	69,484
4.80	104.60	18,427	919	70,403
4.85	104.70	18,508	923	71,326
4.90	104.80	18,589	927	72,254
4.95	104.90	18,670	931	73,185
5.00	105.00	18,751	936	74,121

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

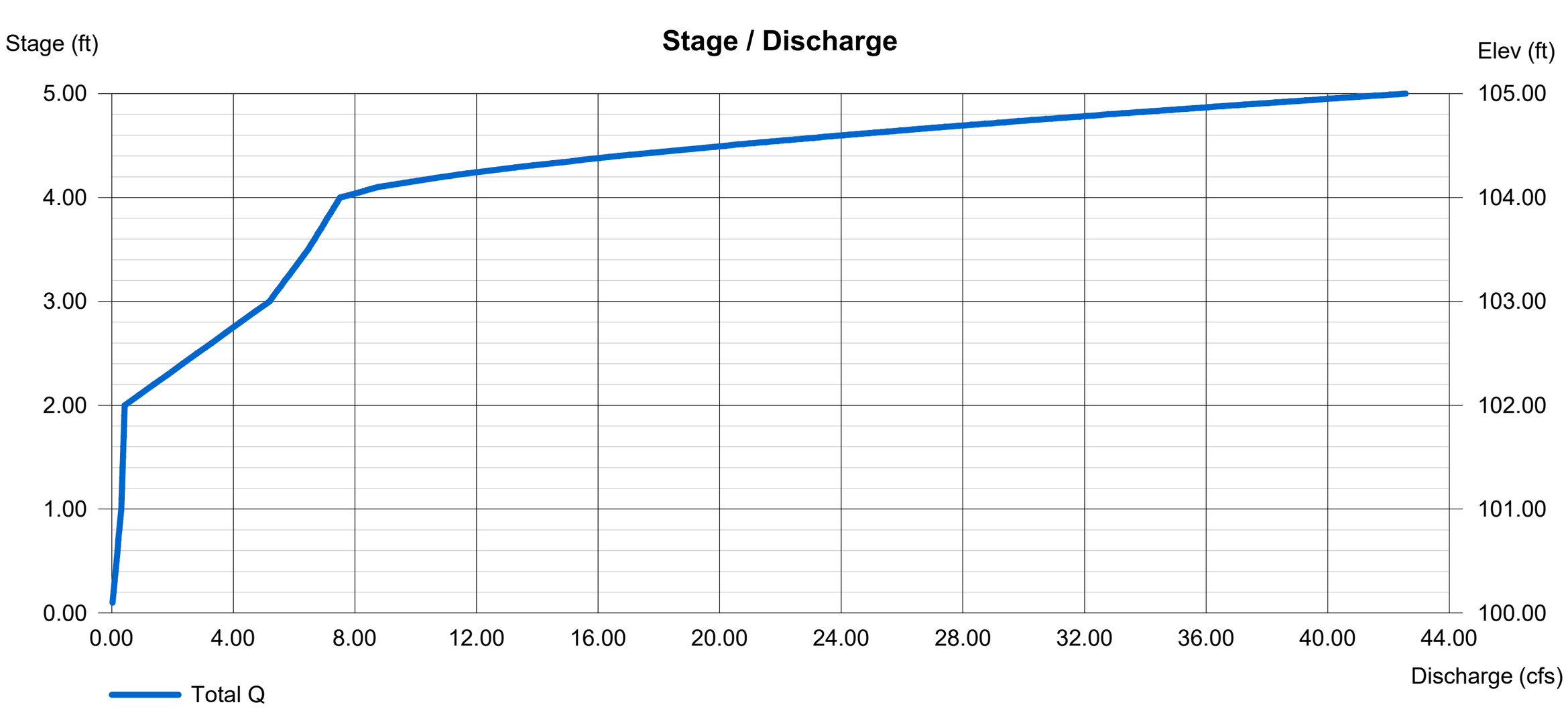
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

BASIN 3

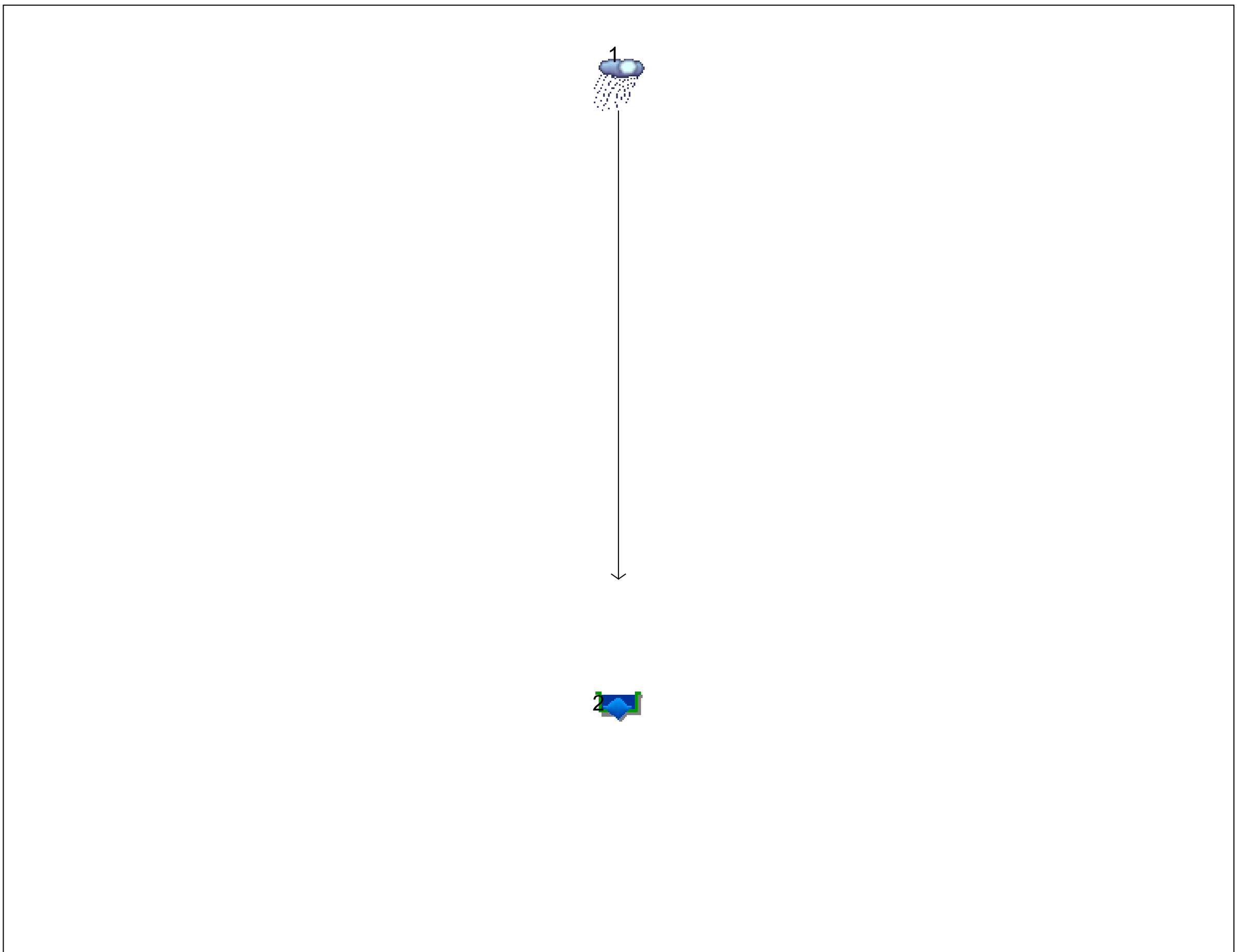
RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 3/29/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 8 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 12.5 ACRES
RUNOFF COEFFICIENT 0.42
PEAK DISCHARGE 28.53 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 8	DISCHARGE (CFS) = 1
TIME (MIN) = 16	DISCHARGE (CFS) = 1
TIME (MIN) = 24	DISCHARGE (CFS) = 1.1
TIME (MIN) = 32	DISCHARGE (CFS) = 1.1
TIME (MIN) = 40	DISCHARGE (CFS) = 1.1
TIME (MIN) = 48	DISCHARGE (CFS) = 1.2
TIME (MIN) = 56	DISCHARGE (CFS) = 1.2
TIME (MIN) = 64	DISCHARGE (CFS) = 1.2
TIME (MIN) = 72	DISCHARGE (CFS) = 1.3
TIME (MIN) = 80	DISCHARGE (CFS) = 1.3
TIME (MIN) = 88	DISCHARGE (CFS) = 1.3
TIME (MIN) = 96	DISCHARGE (CFS) = 1.4
TIME (MIN) = 104	DISCHARGE (CFS) = 1.4
TIME (MIN) = 112	DISCHARGE (CFS) = 1.5
TIME (MIN) = 120	DISCHARGE (CFS) = 1.6
TIME (MIN) = 128	DISCHARGE (CFS) = 1.6
TIME (MIN) = 136	DISCHARGE (CFS) = 1.7
TIME (MIN) = 144	DISCHARGE (CFS) = 1.8
TIME (MIN) = 152	DISCHARGE (CFS) = 1.9
TIME (MIN) = 160	DISCHARGE (CFS) = 2
TIME (MIN) = 168	DISCHARGE (CFS) = 2.1
TIME (MIN) = 176	DISCHARGE (CFS) = 2.2
TIME (MIN) = 184	DISCHARGE (CFS) = 2.5
TIME (MIN) = 192	DISCHARGE (CFS) = 2.6
TIME (MIN) = 200	DISCHARGE (CFS) = 3
TIME (MIN) = 208	DISCHARGE (CFS) = 3.3
TIME (MIN) = 216	DISCHARGE (CFS) = 4
TIME (MIN) = 224	DISCHARGE (CFS) = 4.5
TIME (MIN) = 232	DISCHARGE (CFS) = 6.7
TIME (MIN) = 240	DISCHARGE (CFS) = 14.6
TIME (MIN) = 248	DISCHARGE (CFS) = 28.53
TIME (MIN) = 256	DISCHARGE (CFS) = 5.4
TIME (MIN) = 264	DISCHARGE (CFS) = 3.6
TIME (MIN) = 272	DISCHARGE (CFS) = 2.8
TIME (MIN) = 280	DISCHARGE (CFS) = 2.3
TIME (MIN) = 288	DISCHARGE (CFS) = 2
TIME (MIN) = 296	DISCHARGE (CFS) = 1.8
TIME (MIN) = 304	DISCHARGE (CFS) = 1.7
TIME (MIN) = 312	DISCHARGE (CFS) = 1.5
TIME (MIN) = 320	DISCHARGE (CFS) = 1.4
TIME (MIN) = 328	DISCHARGE (CFS) = 1.3
TIME (MIN) = 336	DISCHARGE (CFS) = 1.2
TIME (MIN) = 344	DISCHARGE (CFS) = 1.2
TIME (MIN) = 352	DISCHARGE (CFS) = 1.1
TIME (MIN) = 360	DISCHARGE (CFS) = 1.1
TIME (MIN) = 368	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	28.53	BASIN 3 Q100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	15.63	BASIN 3 ATTENUATED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

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	28.53	8	248	62,462	------	------	------	BASIN 3 Q100
2	Reservoir	15.63	8	256	62,443	1	104.01	27,991	BASIN 3 ATTENUATED

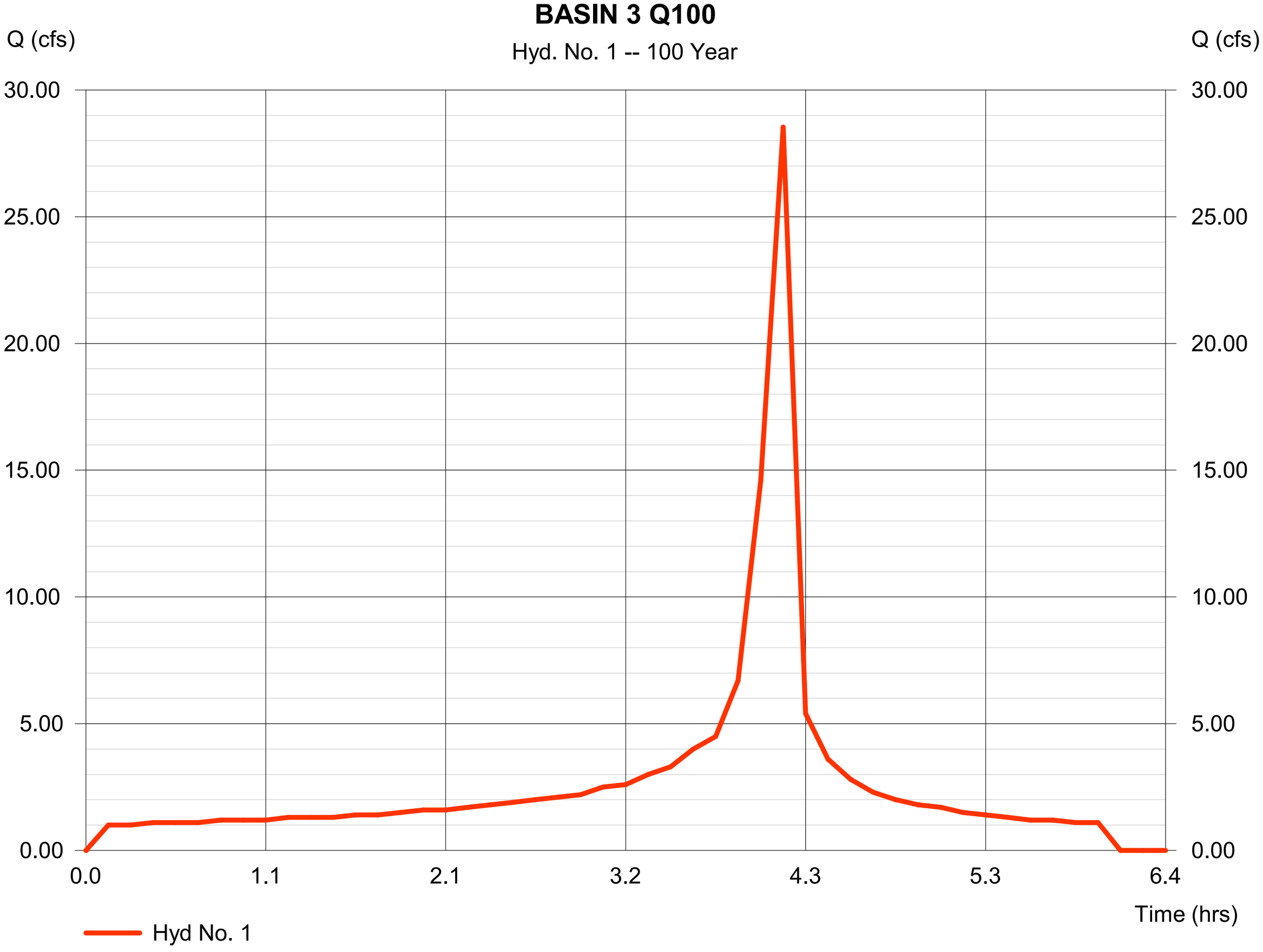
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Monday, 09 / 23 / 2019

Hyd. No. 1

BASIN 3 Q100

Hydrograph type	= Manual	Peak discharge	= 28.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.13 hrs
Time interval	= 8 min	Hyd. volume	= 62,462 cuft



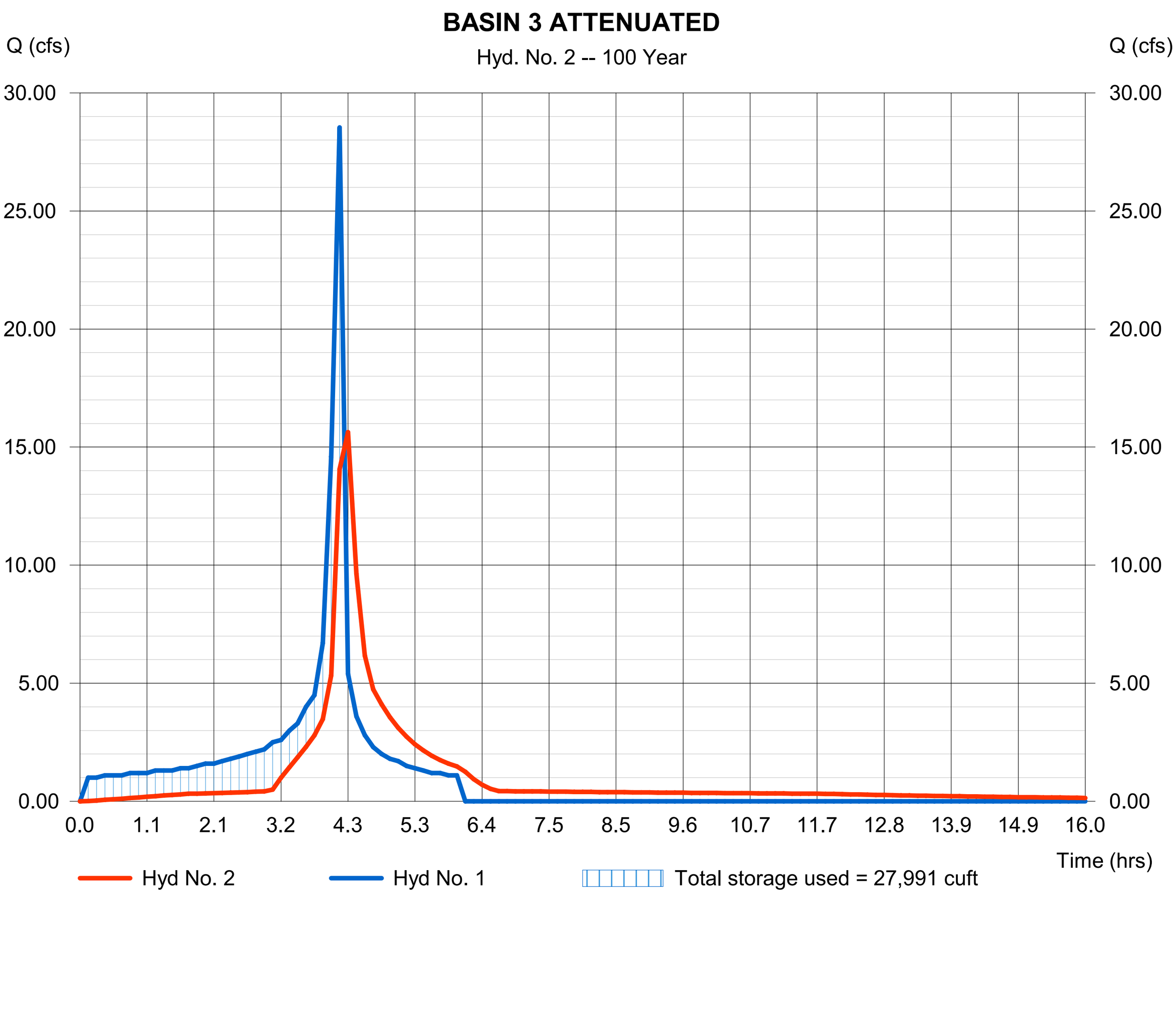
Hydrograph Report

Hyd. No. 2

BASIN 3 ATTENUATED

Hydrograph type	=	Reservoir	Peak discharge	=	15.63 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.27 hrs
Time interval	=	8 min	Hyd. volume	=	62,443 cuft
Inflow hyd. No.	=	1 - BASIN 3 Q100	Max. Elevation	=	104.01 ft
Reservoir name	=	BASIN 3	Max. Storage	=	27,991 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - BASIN 3

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	5,600	0	0
1.00	100.50	6,534	6,067	6,067
2.00	101.00	7,540	7,037	13,104
3.00	101.50	8,618	8,079	21,183
4.00	104.00	9,768	9,193	30,376
4.10	102.50	9,887	983	31,359
4.20	103.00	9,947	992	32,350
4.30	103.50	10,127	1,004	33,354
4.40	104.00	10,248	1,019	34,373
4.50	104.50	10,370	1,031	35,404
4.55	105.00	10,431	520	35,924
4.60	104.30	10,493	523	36,447
4.65	104.40	10,554	526	36,973
4.70	104.50	10,616	529	37,502
4.75	104.60	10,678	532	38,035
4.80	104.70	10,740	535	38,570
4.85	104.80	10,802	539	39,109
4.90	104.90	10,865	542	39,650
4.95	105.00	10,927	545	40,195
5.00	105.00	10,990	548	40,743

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

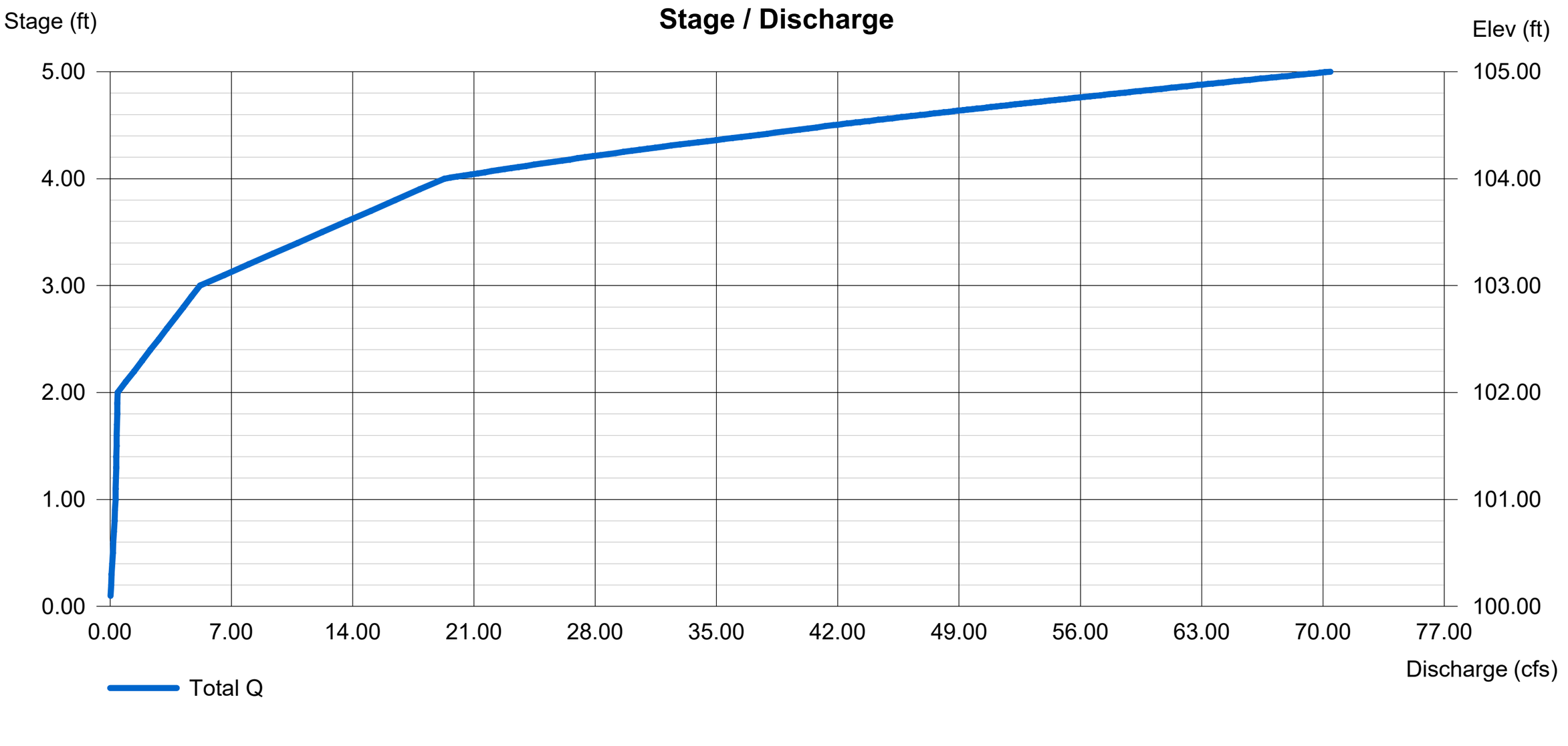
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Discharge



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

BASIN 4

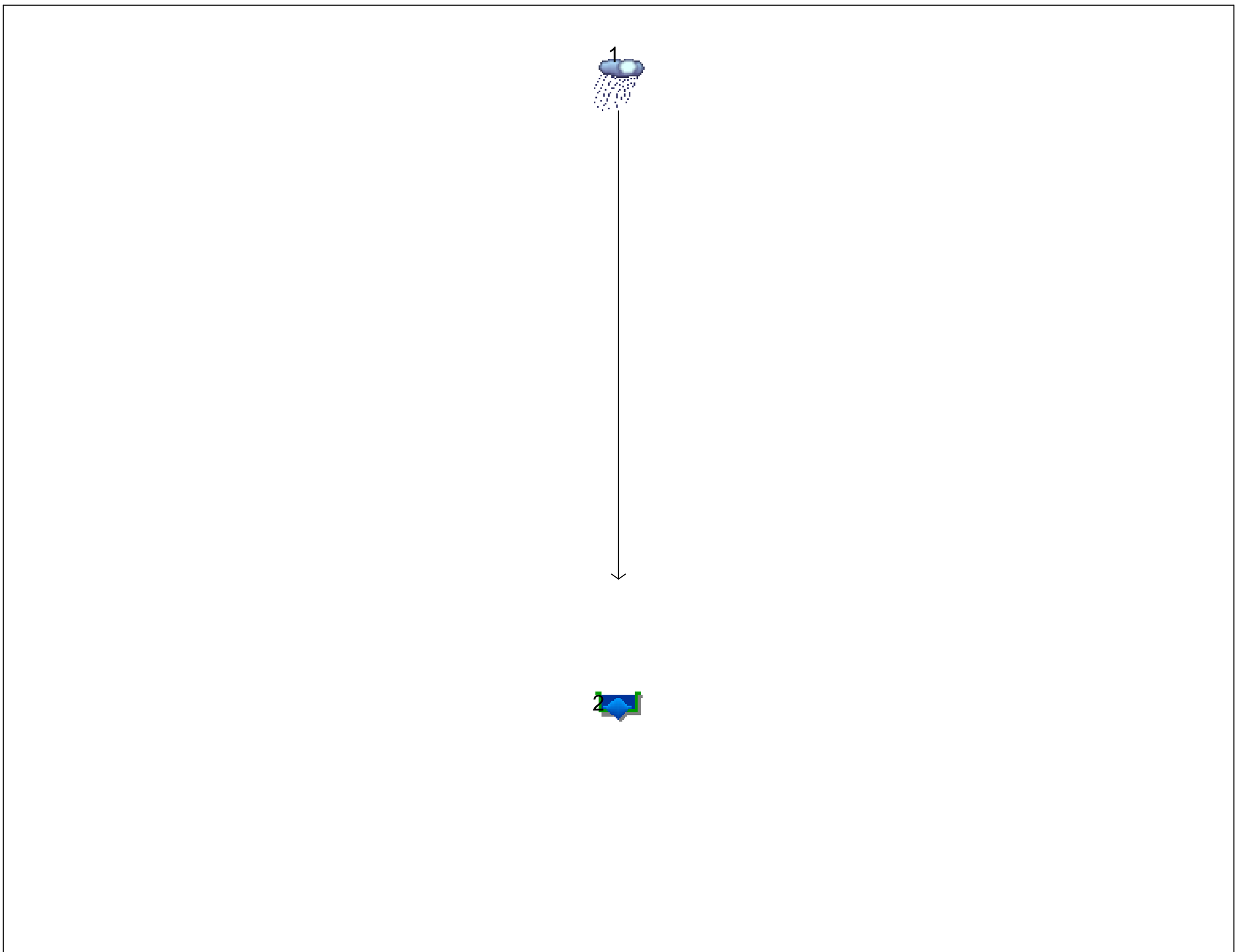
RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 3/29/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 8 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 6.9 ACRES
RUNOFF COEFFICIENT 0.42
PEAK DISCHARGE 17.84 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 8	DISCHARGE (CFS) = 0.6
TIME (MIN) = 16	DISCHARGE (CFS) = 0.6
TIME (MIN) = 24	DISCHARGE (CFS) = 0.6
TIME (MIN) = 32	DISCHARGE (CFS) = 0.6
TIME (MIN) = 40	DISCHARGE (CFS) = 0.6
TIME (MIN) = 48	DISCHARGE (CFS) = 0.6
TIME (MIN) = 56	DISCHARGE (CFS) = 0.7
TIME (MIN) = 64	DISCHARGE (CFS) = 0.7
TIME (MIN) = 72	DISCHARGE (CFS) = 0.7
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TIME (MIN) = 88	DISCHARGE (CFS) = 0.7
TIME (MIN) = 96	DISCHARGE (CFS) = 0.8
TIME (MIN) = 104	DISCHARGE (CFS) = 0.8
TIME (MIN) = 112	DISCHARGE (CFS) = 0.8
TIME (MIN) = 120	DISCHARGE (CFS) = 0.9
TIME (MIN) = 128	DISCHARGE (CFS) = 0.9
TIME (MIN) = 136	DISCHARGE (CFS) = 0.9
TIME (MIN) = 144	DISCHARGE (CFS) = 1
TIME (MIN) = 152	DISCHARGE (CFS) = 1
TIME (MIN) = 160	DISCHARGE (CFS) = 1.1
TIME (MIN) = 168	DISCHARGE (CFS) = 1.2
TIME (MIN) = 176	DISCHARGE (CFS) = 1.2
TIME (MIN) = 184	DISCHARGE (CFS) = 1.4
TIME (MIN) = 192	DISCHARGE (CFS) = 1.5
TIME (MIN) = 200	DISCHARGE (CFS) = 1.7
TIME (MIN) = 208	DISCHARGE (CFS) = 1.8
TIME (MIN) = 216	DISCHARGE (CFS) = 2.2
TIME (MIN) = 224	DISCHARGE (CFS) = 2.5
TIME (MIN) = 232	DISCHARGE (CFS) = 3.7
TIME (MIN) = 240	DISCHARGE (CFS) = 6
TIME (MIN) = 248	DISCHARGE (CFS) = 17.84
TIME (MIN) = 256	DISCHARGE (CFS) = 3
TIME (MIN) = 264	DISCHARGE (CFS) = 2
TIME (MIN) = 272	DISCHARGE (CFS) = 1.5
TIME (MIN) = 280	DISCHARGE (CFS) = 1.3
TIME (MIN) = 288	DISCHARGE (CFS) = 1.1
TIME (MIN) = 296	DISCHARGE (CFS) = 1
TIME (MIN) = 304	DISCHARGE (CFS) = 0.9
TIME (MIN) = 312	DISCHARGE (CFS) = 0.8
TIME (MIN) = 320	DISCHARGE (CFS) = 0.8
TIME (MIN) = 328	DISCHARGE (CFS) = 0.7
TIME (MIN) = 336	DISCHARGE (CFS) = 0.7
TIME (MIN) = 344	DISCHARGE (CFS) = 0.6
TIME (MIN) = 352	DISCHARGE (CFS) = 0.6
TIME (MIN) = 360	DISCHARGE (CFS) = 0.6
TIME (MIN) = 368	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	17.84	BASIN 4 Q100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	5.586	BASIN 4 ATTENUATED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

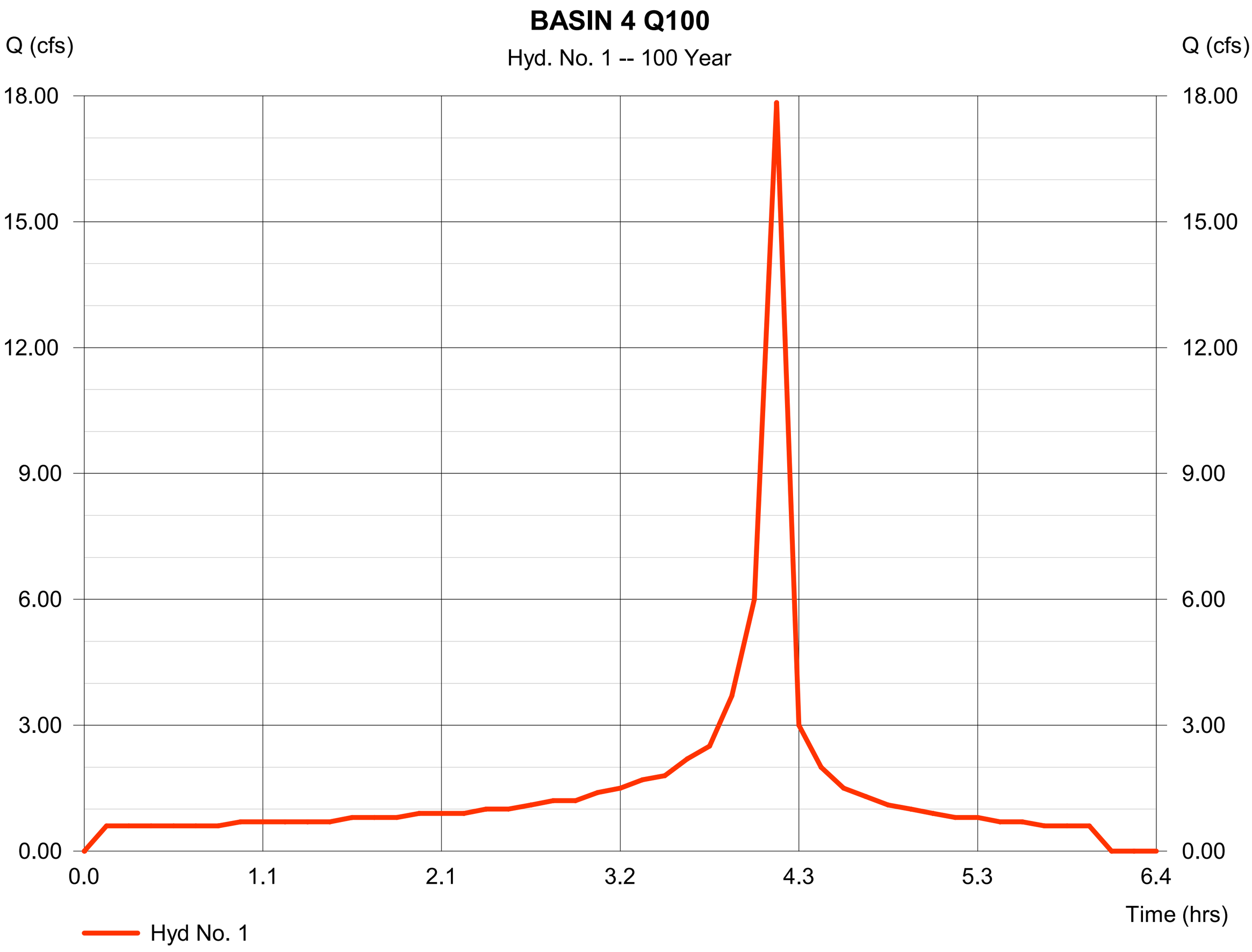
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	17.84	8	248	34,531	------	------	------	BASIN 4 Q100
2	Reservoir	5.586	8	256	34,517	1	103.23	20,138	BASIN 4 ATTENUATED

Hydrograph Report

Hyd. No. 1

BASIN 4 Q100

Hydrograph type	= Manual	Peak discharge	= 17.84 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.13 hrs
Time interval	= 8 min	Hyd. volume	= 34,531 cuft



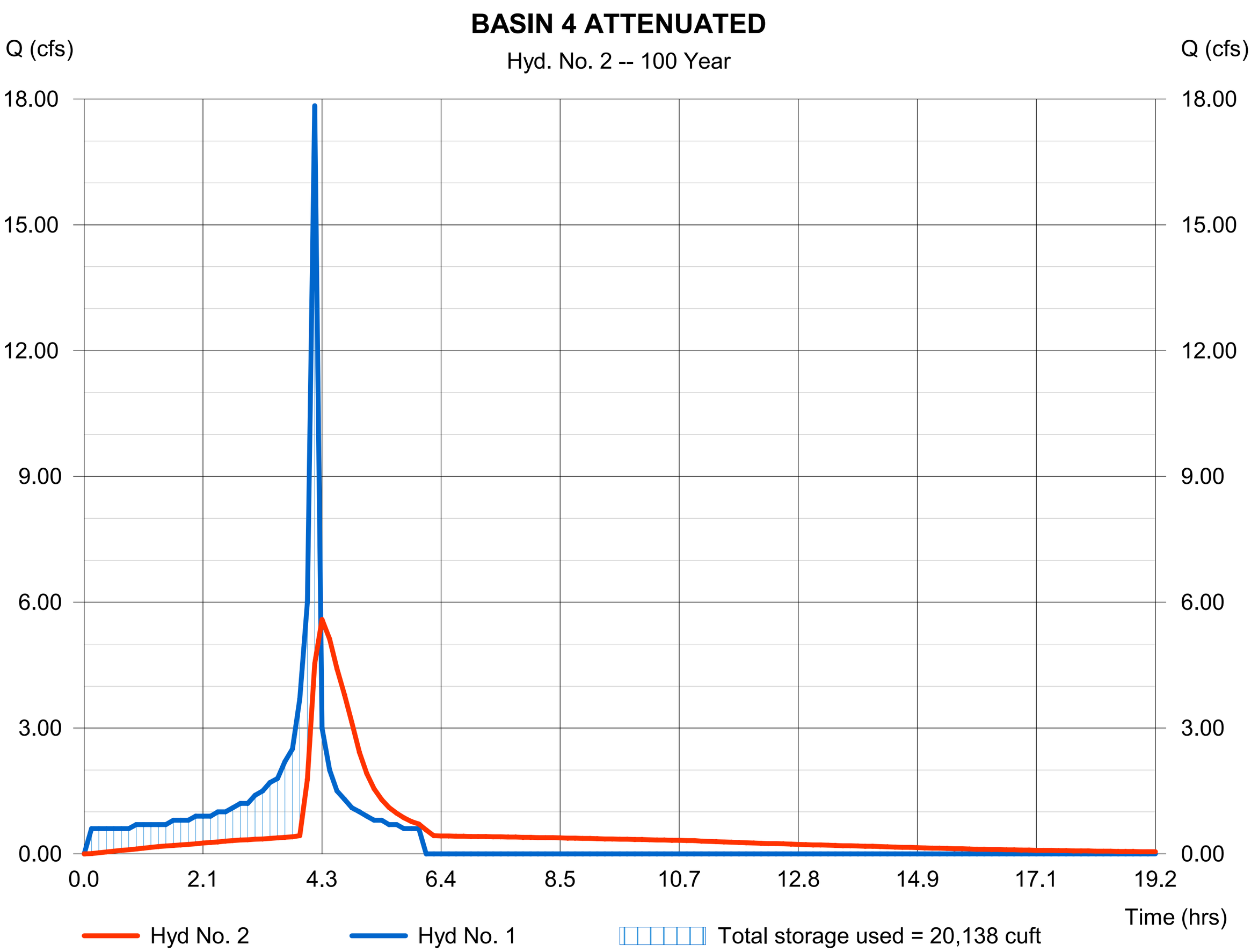
Hydrograph Report

Hyd. No. 2

BASIN 4 ATTENUATED

Hydrograph type	=	Reservoir	Peak discharge	=	5.586 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.27 hrs
Time interval	=	8 min	Hyd. volume	=	34,517 cuft
Inflow hyd. No.	=	1 - BASIN 4 Q100	Max. Elevation	=	103.23 ft
Reservoir name	=	BASIN4	Max. Storage	=	20,138 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 — Monday, 09 / 23 / 2019

Pond No. 1 - BASIN4

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	5,000	0	0
0.50	100.50	5,433	2,608	2,608
1.00	101.00	5,885	2,830	5,438
1.50	101.50	6,354	3,060	8,498
2.00	102.00	6,841	3,299	11,796
2.50	102.50	7,146	3,497	15,293
3.00	103.00	7,346	3,623	18,916
3.50	103.50	8,411	3,939	22,855
4.00	104.00	8,970	4,345	27,201
4.50	104.50	9,547	4,629	31,830
5.00	105.00	10,143	4,923	36,752

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

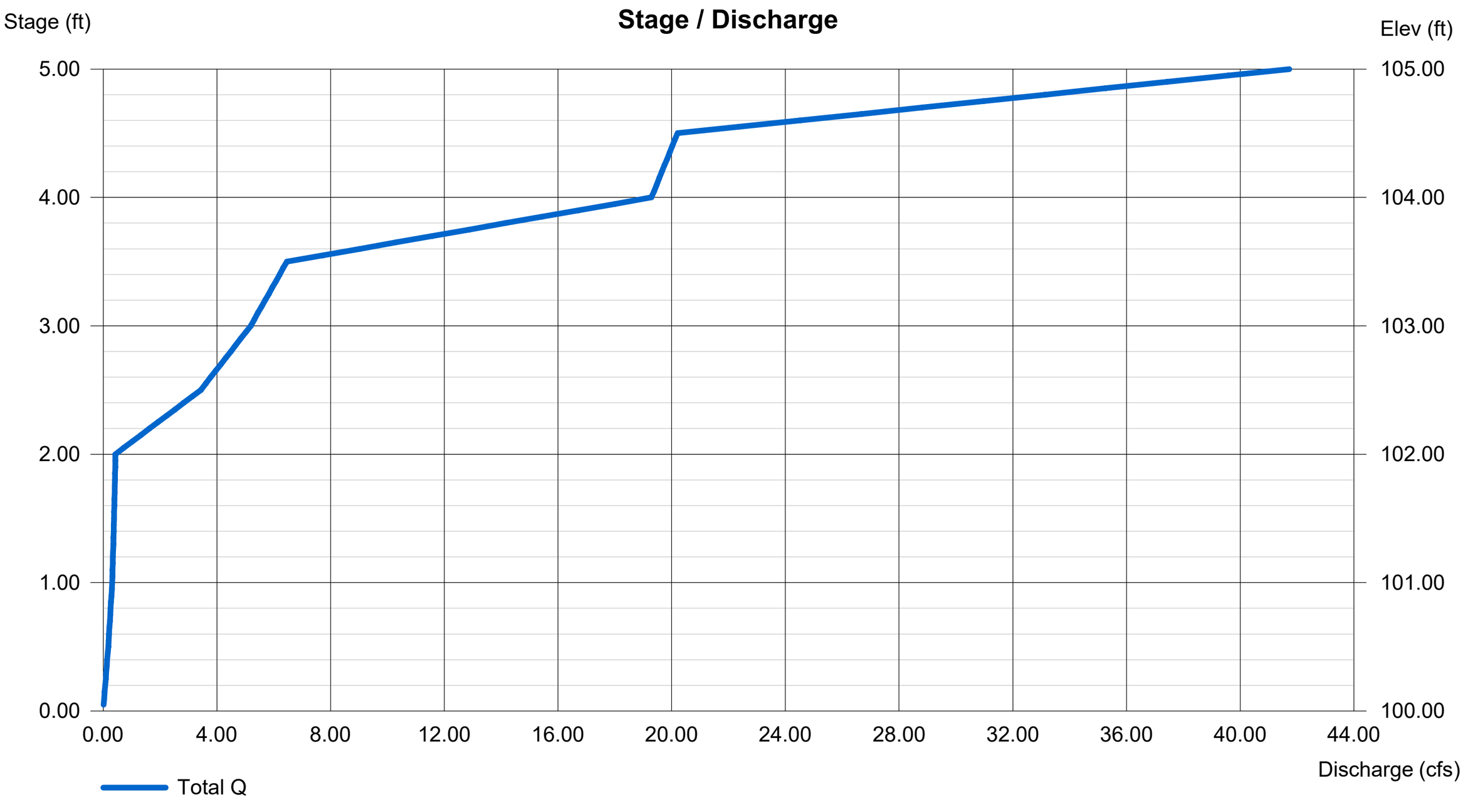
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

BASIN 5

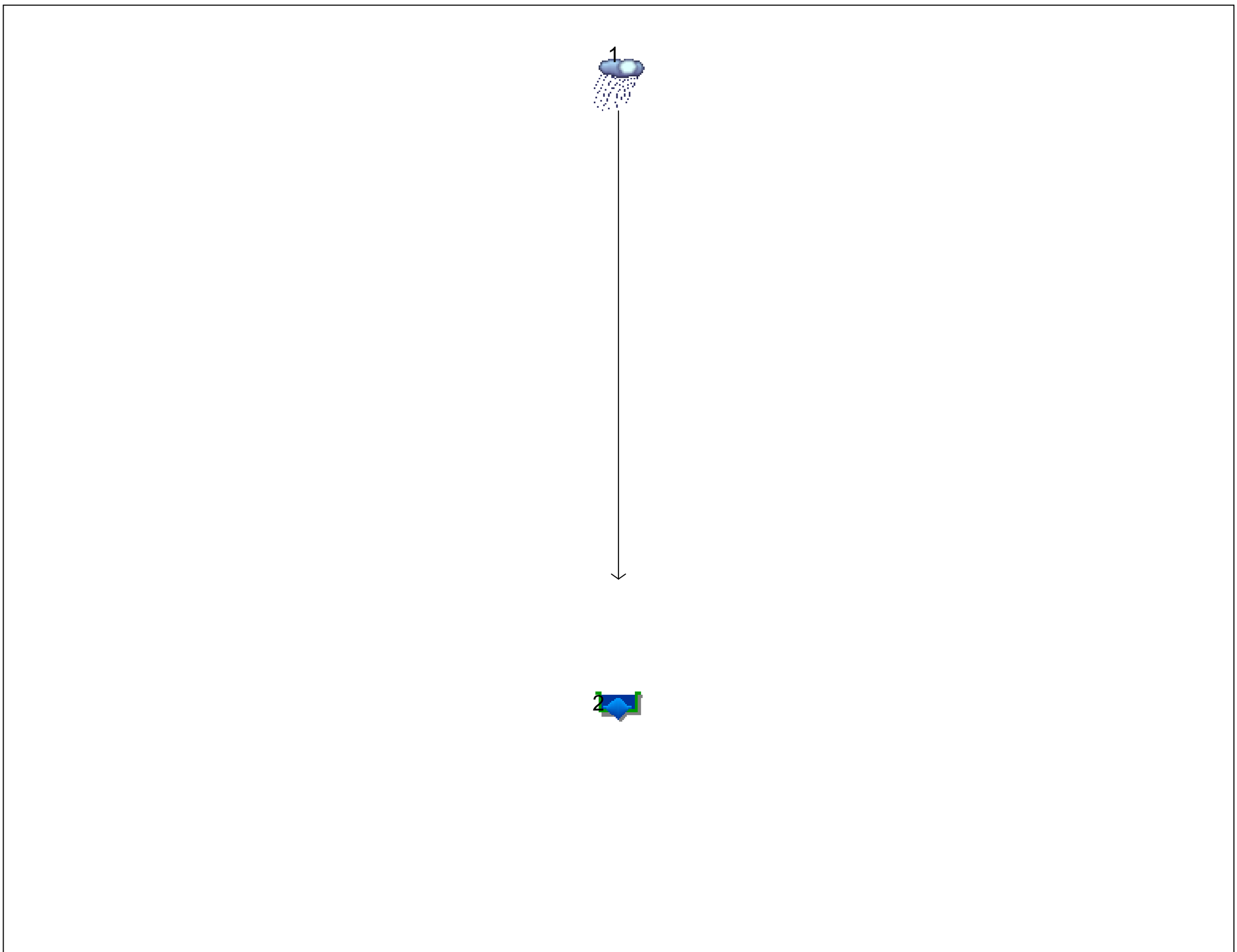
RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 9/23/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 6 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 5.7 ACRES
RUNOFF COEFFICIENT 0.54
PEAK DISCHARGE 23.53 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 6	DISCHARGE (CFS) = 0.6
TIME (MIN) = 12	DISCHARGE (CFS) = 0.6
TIME (MIN) = 18	DISCHARGE (CFS) = 0.6
TIME (MIN) = 24	DISCHARGE (CFS) = 0.6
TIME (MIN) = 30	DISCHARGE (CFS) = 0.6
TIME (MIN) = 36	DISCHARGE (CFS) = 0.7
TIME (MIN) = 42	DISCHARGE (CFS) = 0.7
TIME (MIN) = 48	DISCHARGE (CFS) = 0.7
TIME (MIN) = 54	DISCHARGE (CFS) = 0.7
TIME (MIN) = 60	DISCHARGE (CFS) = 0.7
TIME (MIN) = 66	DISCHARGE (CFS) = 0.7
TIME (MIN) = 72	DISCHARGE (CFS) = 0.7
TIME (MIN) = 78	DISCHARGE (CFS) = 0.8
TIME (MIN) = 84	DISCHARGE (CFS) = 0.8
TIME (MIN) = 90	DISCHARGE (CFS) = 0.8
TIME (MIN) = 96	DISCHARGE (CFS) = 0.8
TIME (MIN) = 102	DISCHARGE (CFS) = 0.8
TIME (MIN) = 108	DISCHARGE (CFS) = 0.9
TIME (MIN) = 114	DISCHARGE (CFS) = 0.9
TIME (MIN) = 120	DISCHARGE (CFS) = 0.9
TIME (MIN) = 126	DISCHARGE (CFS) = 1
TIME (MIN) = 132	DISCHARGE (CFS) = 1
TIME (MIN) = 138	DISCHARGE (CFS) = 1
TIME (MIN) = 144	DISCHARGE (CFS) = 1
TIME (MIN) = 150	DISCHARGE (CFS) = 1.1
TIME (MIN) = 156	DISCHARGE (CFS) = 1.1
TIME (MIN) = 162	DISCHARGE (CFS) = 1.2
TIME (MIN) = 168	DISCHARGE (CFS) = 1.2
TIME (MIN) = 174	DISCHARGE (CFS) = 1.3
TIME (MIN) = 180	DISCHARGE (CFS) = 1.4
TIME (MIN) = 186	DISCHARGE (CFS) = 1.5
TIME (MIN) = 192	DISCHARGE (CFS) = 1.6
TIME (MIN) = 198	DISCHARGE (CFS) = 1.7
TIME (MIN) = 204	DISCHARGE (CFS) = 1.9
TIME (MIN) = 210	DISCHARGE (CFS) = 2.1
TIME (MIN) = 216	DISCHARGE (CFS) = 2.3
TIME (MIN) = 222	DISCHARGE (CFS) = 2.8
TIME (MIN) = 228	DISCHARGE (CFS) = 3.2
TIME (MIN) = 234	DISCHARGE (CFS) = 4.7
TIME (MIN) = 240	DISCHARGE (CFS) = 6.9
TIME (MIN) = 246	DISCHARGE (CFS) = 23.53
TIME (MIN) = 252	DISCHARGE (CFS) = 3.8
TIME (MIN) = 258	DISCHARGE (CFS) = 2.5
TIME (MIN) = 264	DISCHARGE (CFS) = 2
TIME (MIN) = 270	DISCHARGE (CFS) = 1.7
TIME (MIN) = 276	DISCHARGE (CFS) = 1.4
TIME (MIN) = 282	DISCHARGE (CFS) = 1.3
TIME (MIN) = 288	DISCHARGE (CFS) = 1.2
TIME (MIN) = 294	DISCHARGE (CFS) = 1.1
TIME (MIN) = 300	DISCHARGE (CFS) = 1
TIME (MIN) = 306	DISCHARGE (CFS) = 0.9
TIME (MIN) = 312	DISCHARGE (CFS) = 0.9
TIME (MIN) = 318	DISCHARGE (CFS) = 0.8
TIME (MIN) = 324	DISCHARGE (CFS) = 0.8
TIME (MIN) = 330	DISCHARGE (CFS) = 0.8
TIME (MIN) = 336	DISCHARGE (CFS) = 0.7
TIME (MIN) = 342	DISCHARGE (CFS) = 0.7
TIME (MIN) = 348	DISCHARGE (CFS) = 0.7
TIME (MIN) = 354	DISCHARGE (CFS) = 0.6
TIME (MIN) = 360	DISCHARGE (CFS) = 0.6
TIME (MIN) = 366	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	23.53	BASIN 5 Q100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	7.136	BASIN 5 ATTENUATED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

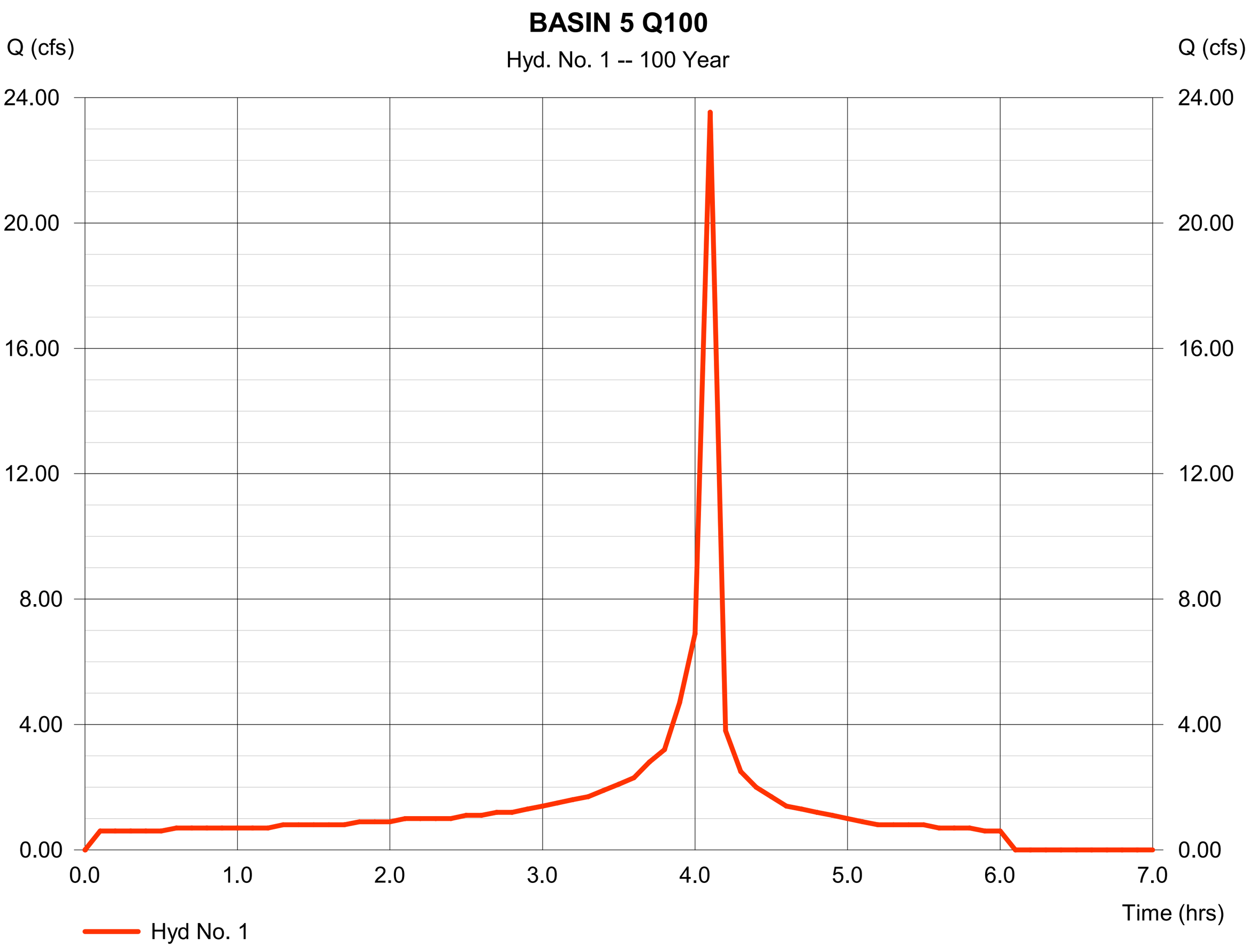
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	23.53	6	246	36,551	------	------	------	BASIN 5 Q100
2	Reservoir	7.136	6	252	36,543	1	103.93	15,838	BASIN 5 ATTENUATED

Hydrograph Report

Hyd. No. 1

BASIN 5 Q100

Hydrograph type	= Manual	Peak discharge	= 23.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.10 hrs
Time interval	= 6 min	Hyd. volume	= 36,551 cuft



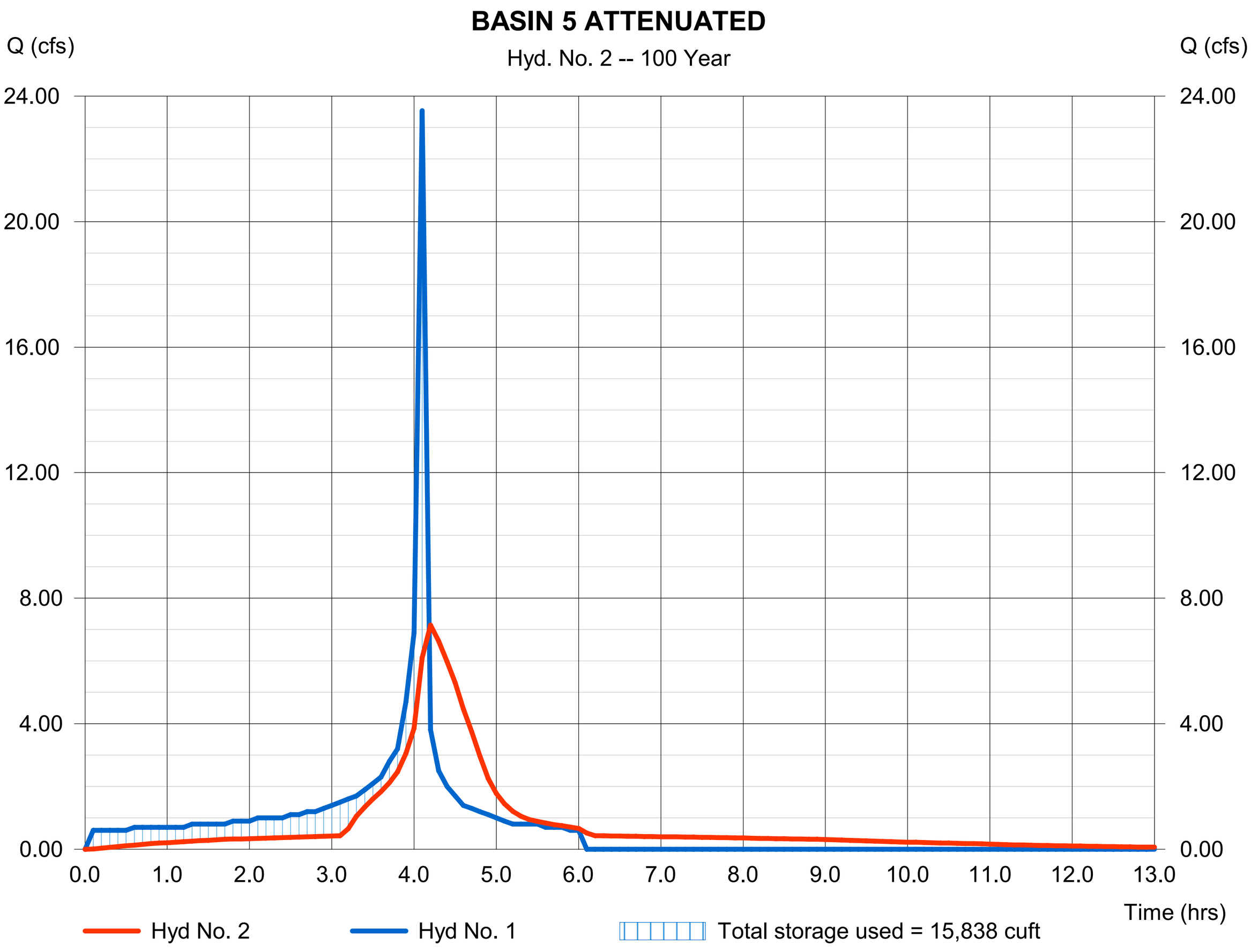
Hydrograph Report

Hyd. No. 2

BASIN 5 ATTENUATED

Hydrograph type	=	Reservoir	Peak discharge	=	7.136 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.20 hrs
Time interval	=	6 min	Hyd. volume	=	36,543 cuft
Inflow hyd. No.	=	1 - BASIN 5 Q100	Max. Elevation	=	103.93 ft
Reservoir name	=	BASIN 5	Max. Storage	=	15,838 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - BASIN 5

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	2,720	0	0
0.50	100.50	3,068	1,447	1,447
1.00	101.00	3,417	1,621	3,068
1.50	101.50	3,794	1,803	4,871
2.00	102.00	4,170	1,991	6,862
2.50	102.50	4,575	2,186	9,048
3.00	103.00	4,981	2,389	11,437
3.50	103.50	5,414	2,599	14,036
4.00	104.00	5,847	2,815	16,851
4.50	104.50	6,309	3,039	19,890
5.00	105.00	6,771	3,270	23,160

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

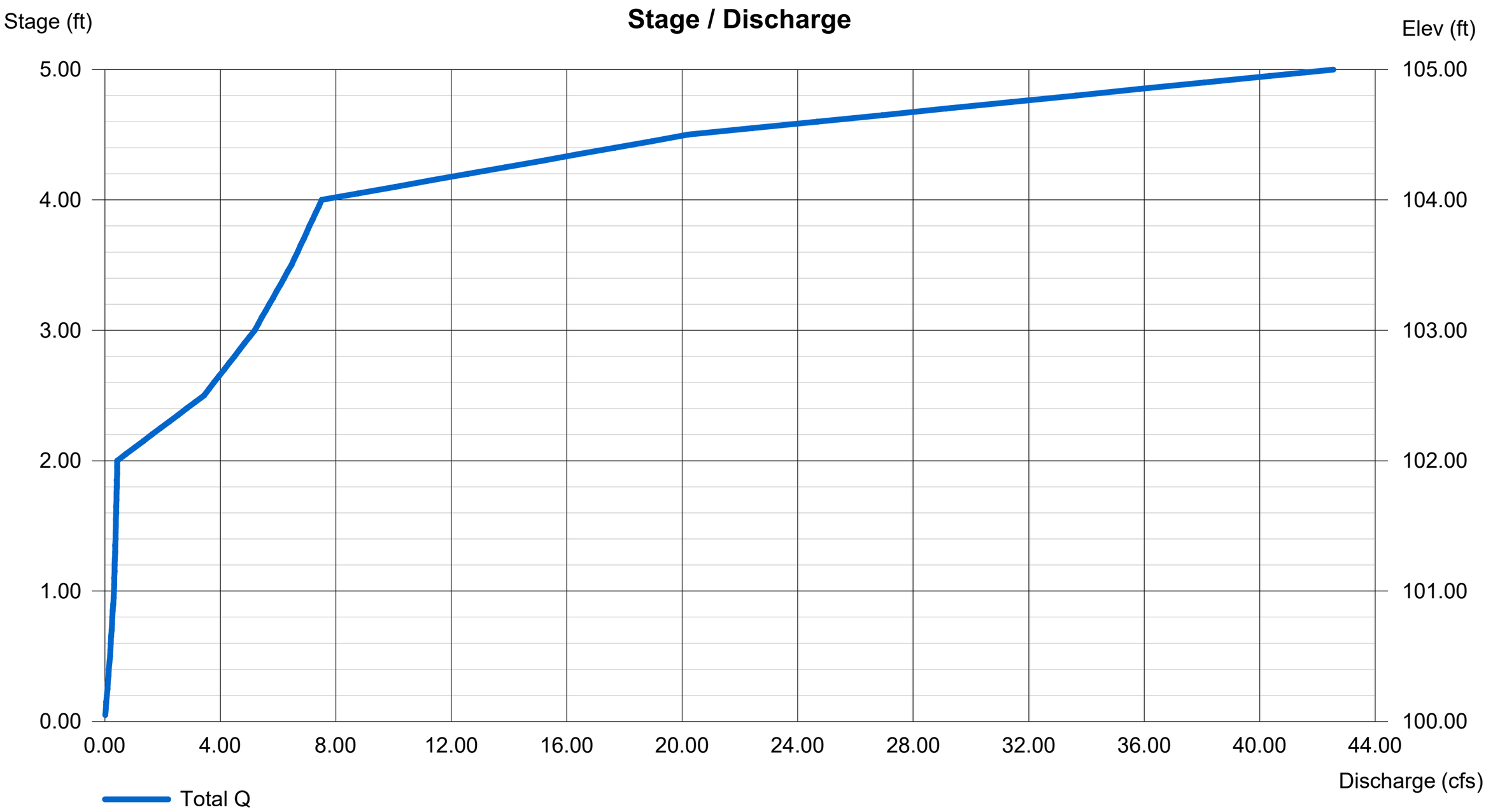
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

BASIN 6

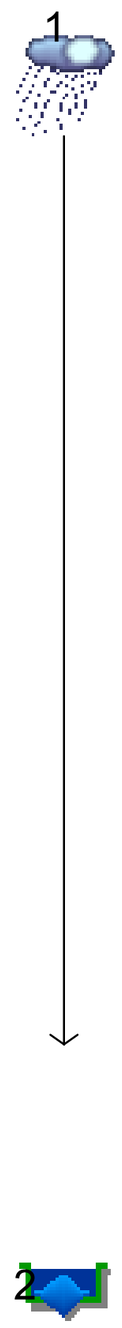
RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 3/31/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 11 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 5.2 ACRES
RUNOFF COEFFICIENT 0.42
PEAK DISCHARGE 11.59 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 11	DISCHARGE (CFS) = 0.4
TIME (MIN) = 22	DISCHARGE (CFS) = 0.4
TIME (MIN) = 33	DISCHARGE (CFS) = 0.5
TIME (MIN) = 44	DISCHARGE (CFS) = 0.5
TIME (MIN) = 55	DISCHARGE (CFS) = 0.5
TIME (MIN) = 66	DISCHARGE (CFS) = 0.5
TIME (MIN) = 77	DISCHARGE (CFS) = 0.5
TIME (MIN) = 88	DISCHARGE (CFS) = 0.5
TIME (MIN) = 99	DISCHARGE (CFS) = 0.6
TIME (MIN) = 110	DISCHARGE (CFS) = 0.6
TIME (MIN) = 121	DISCHARGE (CFS) = 0.6
TIME (MIN) = 132	DISCHARGE (CFS) = 0.7
TIME (MIN) = 143	DISCHARGE (CFS) = 0.7
TIME (MIN) = 154	DISCHARGE (CFS) = 0.8
TIME (MIN) = 165	DISCHARGE (CFS) = 0.8
TIME (MIN) = 176	DISCHARGE (CFS) = 0.9
TIME (MIN) = 187	DISCHARGE (CFS) = 1
TIME (MIN) = 198	DISCHARGE (CFS) = 1.1
TIME (MIN) = 209	DISCHARGE (CFS) = 1.4
TIME (MIN) = 220	DISCHARGE (CFS) = 1.5
TIME (MIN) = 231	DISCHARGE (CFS) = 2.3
TIME (MIN) = 242	DISCHARGE (CFS) = 3
TIME (MIN) = 253	DISCHARGE (CFS) = 11.59
TIME (MIN) = 264	DISCHARGE (CFS) = 1.8
TIME (MIN) = 275	DISCHARGE (CFS) = 1.2
TIME (MIN) = 286	DISCHARGE (CFS) = 0.9
TIME (MIN) = 297	DISCHARGE (CFS) = 0.8
TIME (MIN) = 308	DISCHARGE (CFS) = 0.7
TIME (MIN) = 319	DISCHARGE (CFS) = 0.6
TIME (MIN) = 330	DISCHARGE (CFS) = 0.6
TIME (MIN) = 341	DISCHARGE (CFS) = 0.5
TIME (MIN) = 352	DISCHARGE (CFS) = 0.5
TIME (MIN) = 363	DISCHARGE (CFS) = 0.4
TIME (MIN) = 374	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	11.59	BASIN 6 Q100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	4.274	BASIN 6 ATTENUATED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

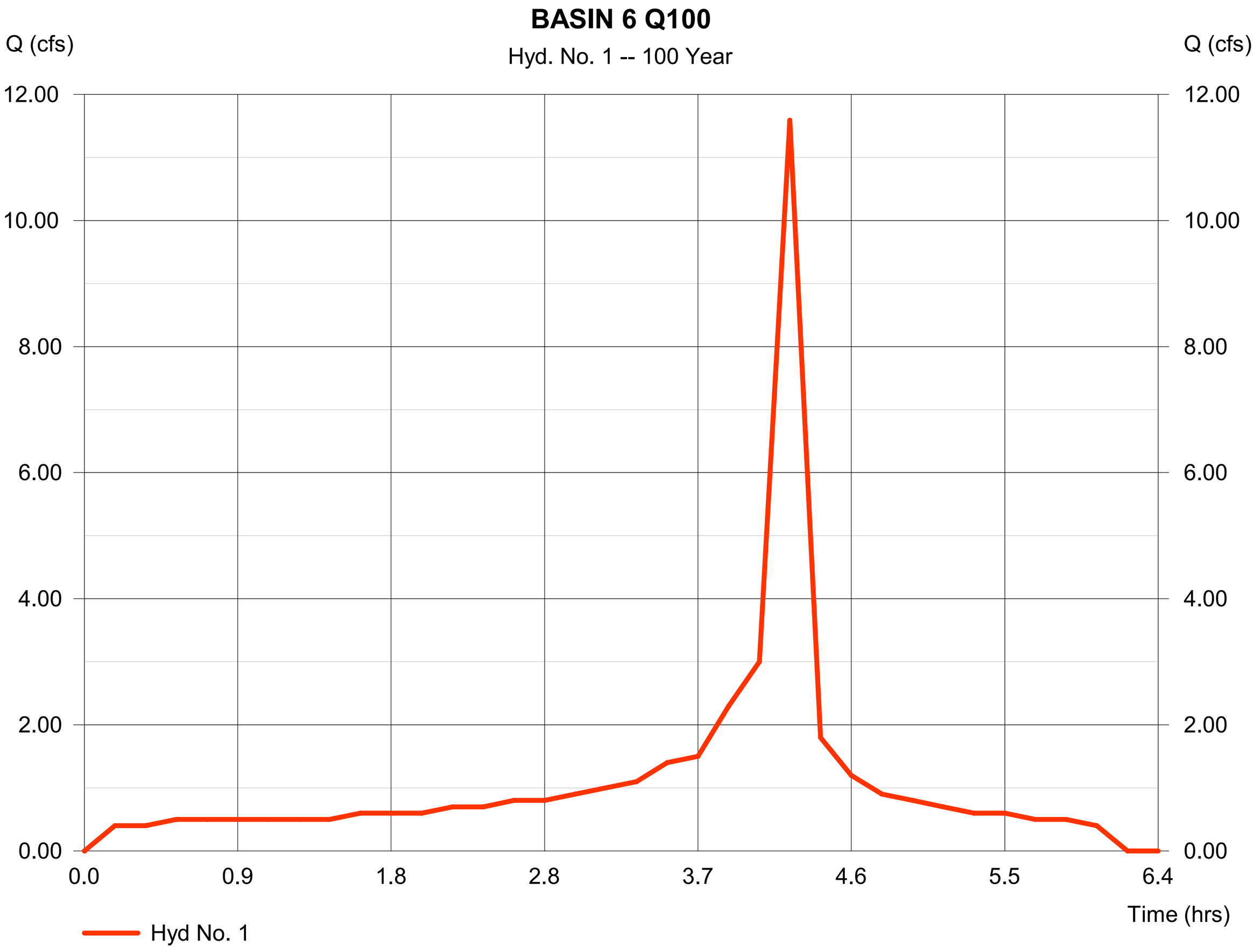
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	11.59	11	253	25,997	------	------	------	BASIN 6 Q100
2	Reservoir	4.274	11	264	25,985	1	102.86	14,777	BASIN 6 ATTENUATED

Hydrograph Report

Hyd. No. 1

BASIN 6 Q100

Hydrograph type	= Manual	Peak discharge	= 11.59 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.22 hrs
Time interval	= 11 min	Hyd. volume	= 25,997 cuft



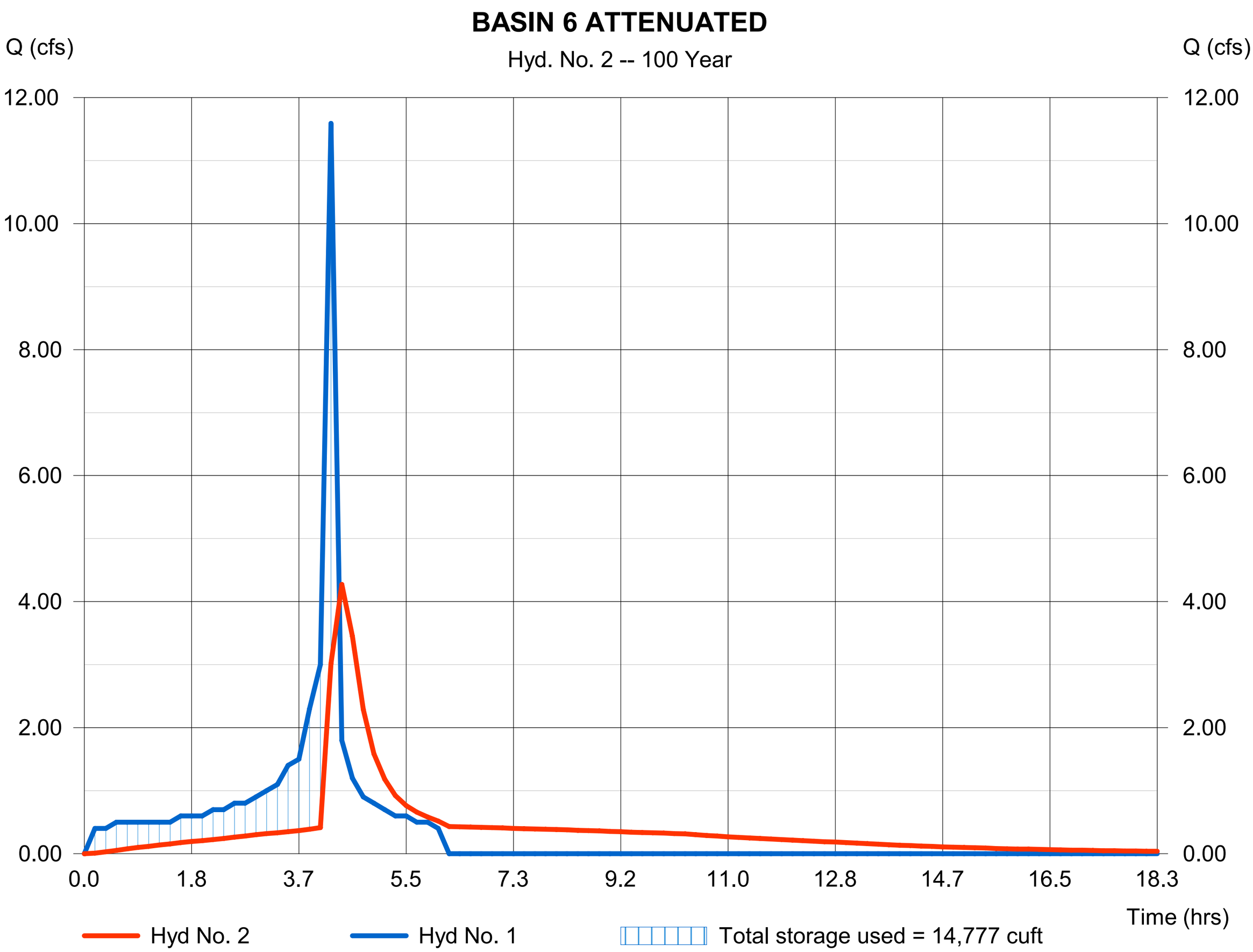
Hydrograph Report

Hyd. No. 2

BASIN 6 ATTENUATED

Hydrograph type	=	Reservoir	Peak discharge	=	4.274 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.40 hrs
Time interval	=	11 min	Hyd. volume	=	25,985 cuft
Inflow hyd. No.	=	1 - BASIN 6 Q100	Max. Elevation	=	102.86 ft
Reservoir name	=	BASIN 6	Max. Storage	=	14,777 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - BASIN 6

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	4,226	0	0
0.50	100.50	4,635	2,215	2,215
1.00	101.00	5,043	2,420	4,635
1.50	101.50	5,482	2,631	7,266
2.00	102.00	5,920	2,851	10,117
2.50	102.50	6,390	3,078	13,194
3.00	103.00	6,859	3,312	16,506
3.50	103.50	7,360	3,555	20,061
4.00	104.00	7,860	3,805	23,866
4.50	104.50	8,392	4,063	27,929
5.00	105.00	8,923	4,329	32,258

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

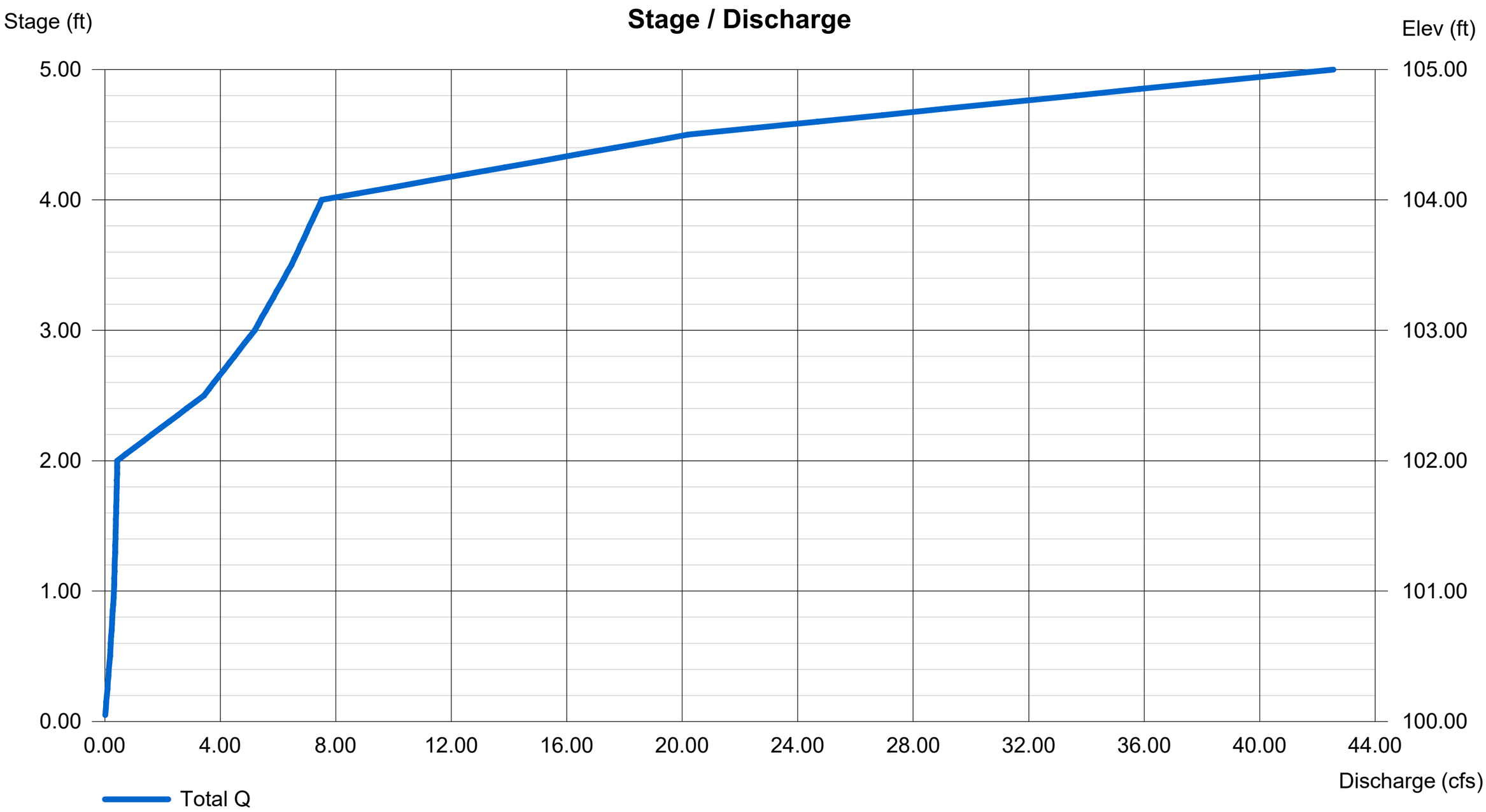
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10