PRELIMINARY DRAINAGE STUDY

Walmart Store 4059-00
NWC Perris Blvd and Santiago Drive
Moreno Valley, CA
APN: 485-220-041
PA13 - 0032

October 15, 2013

PREPARED BY:

Kimley-Horn & Associates, Inc.
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Orange, CA 92868
(714) 939-1030

Kimley-Horn
and Associates, Inc.

Certification by Engineer or Authorized Qualified Designee

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathered the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Kevin Roberson, PE Date

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Appendix J – Flood and Basin Routing Analysis
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References

Hydrology Manual. Riverside County Flood Control and Water Conservation District, April 1978.

Design Handbook for Low Impact Development Best Management Practices. Riverside County Flood Control and Water Conservation District, September 2011.

Section 100

100.0 Introduction

Kimley-Horn and Associates, Inc. (KHA) has been retained to prepare a Preliminary Drainage Study for the proposed Walmart Supercenter in the City of Moreno Valley, California. The intention of this report is to confirm that the proposed improvements conform to the Riverside County Department of Public Works' requirements for urban stormwater mitigation.

100.1 Project Description

The proposed development consists of the construction of an approximately 185,000 square foot Walmart Supercenter and associated improvements. The associated improvements include, but are not limited to the following: site grading, domestic water service, fire suppression service, sanitary sewer service, concrete and asphalt pavement, landscaping and irrigation, underground storm drain system, and one (1) above ground infiltration basin. The Walmart lot area is approximately 21.03 acres.

There is a proposed 39" storm drain extension in Santiago Drive as part of Riverside County's Master Drainage Plan (MDP). This storm drain system was designed to hold the stormwater runoff for a Single-Family residential site. Since the proposed site has changed use to Commercial, and due to unforeseen downstream capacity issues, a detention basin has been designed to hold the difference between what the downstream pipe can accommodate and the proposed runoff from the Walmart site.

The purpose of this report is to provide information regarding the Storm Water Management System (SWMS) design for the proposed development. This investigation was conducted to evaluate the hydrologic and hydraulic conditions, determine the impact on the local drainage system, and ensure that post-development peak flows will not increase beyond the level determined by the Master Drainage Plan and the downstream system capacity.

100.2 Location

The project is located at the northwest corner of Perris Blvd and Santiago Drive in Moreno Valley, CA. The project is bounded by Perris Blvd to the east, Gentian Ave to the north, California Aqueduct to the west, and Santiago Drive to the south. For reference, see **Exhibit 1**, *Location Map*. A future development will be constructed in the lot to the southeast, but the nature/type of the development is unknown at this time.

100.3 Drainage Characteristics

The site is located in Zone X per the Federal Emergency Management Administration (FEMA) Flood Insurance Rate Map (FIRM) panel 06065C0765G, dated August 28, 2008. Flood Zone X is defined by FEMA as the area determined to be outside the 500-year flood and protected by levee from 100-year flood. No portion of the site is located within the special flood hazard area inundated by the 100-year flood. For reference, see **Exhibit 2**, *FIRM Map*.

Pre-development Condition

The site is currently undeveloped. The existing slope of the land is from northwest to southeast. The existing site is one large on-site sub-basin and two small off-site sub-basins, and lies within a Master Drainage Plan (MDP). All predevelopment run-off sheet flows into the adjacent public streets (Perris Boulevard and Santiago Drive). No existing storm water treatment devices were observed on-site. For an exhibit of the post-development drainage condition, see **Exhibit 3**, Existing *Drainage Map.*

Post-development Condition

Initially, the site was proposed as Single Family Residential, and a storm drain system was designed to accommodate a Single Family Residential development with a peak discharge of 35.21 cfs. However, due to a change of use of the site to Commercial Retail, a higher peak flow of 49.03 cfs has been estimated due to the increased "c" value and impervious area. The existing downstream storm drain system (Line M2) in Iris Avenue provides an additional restriction on the amount of run-off that can be accommodated, reducing the allowable discharge to 26.00 cfs. Refer to **Appendix D**, (*Existing and Proposed Hydrology Calculations*). A detention basin is incorporated into the site design to maintain a peak discharge of 26.00 cfs.

The post-development drainage area is comprised of fourteen (14) sub-areas. Each sub-area has either a corresponding catch basin that it drains to or an underground manhole junction structure. The proposed site grading is designed to use the existing lay of the land, with the parking areas sloping from northwest to southeast. The proposed site drainage is conveyed via an underground storm drain system. All storm water runoff is directed to the proposed dry pond storm water treatment area (infiltration basin) in front of the property along Santiago Road.

For an exhibit of the post-development drainage condition, see **Exhibit 4**, *Proposed Drainage Map.*

100.4 Flood Routing Analysis

General

Flood routing analysis was performed using AES Flood Routing Analysis software for Riverside County to size the proposed on-site detention basin. The runoff volumes for 2, 5, 10, and 100 year storm frequencies for 1, 3, 6, and 24 hour storm events were calculated. These volumes were calculated assuming no outlet storm drain pipe systems were implemented to release the storm water from the basin. The results are listed Appendix E.

Based on the Riverside County Hydrology Manual, the rainfall depths were determined for our specific project site. The rainfall depth versus the return period was plotted on Plate E-5.7 and can be found in Appendix F for reference. The loss rates were also calculated based on the Riverside County Hydrology Manual and can be found in Appendix G.

Per the Technical Memorandum prepared by JLC Engineering Consultant, Inc. (see Appendix D for reference) the allowable Q (discharge) released from our project site cannot exceeded 26.00 cfs.

Basin Design

A proposed basin was designed on the south-west corner of the project site. The basin will be used for both on-site storm water detention and water treatment. It will incorporate an outlet pipe that will connect to the proposed Line M2 as outlined in the JLC technical memorandum.

The basin is designed to have a 3:1 side slope and will hold a maximum depth of water at 6.0 feet with a 1.0 foot freeboard. The bottom elevation of the basin is set at 1503.00. The basin storage capacity was calculated at various levels of water depth, this calculation can be found in Appendix H.

Based on the recent WQMP requirement (please see WQMP report), 36,822 cubic feet (0.85 acre-ft.) of basin dead storage volume will be needed for this project. This dead storage volume is provided in between elevation 1503.00 and 1505.00.

In order to ensure that the on-site storm water released does not exceed the 26.00 cfs requirement, a CMP riser structure was designed with holes at two different elevations. The water level, storage capacity, and discharge relationship was analyzed and determined and can be found in Appendix I.

Typically, small drainage areas are controlled by the 3 and 6-hour duration storm events while large drainage areas are controlled by the 24-hour storm event. When a detention basin is incorporated in the design, the long duration storm events are used to control the overall design even if the proposed basin peak inflow rate is lower than the short duration storm events.

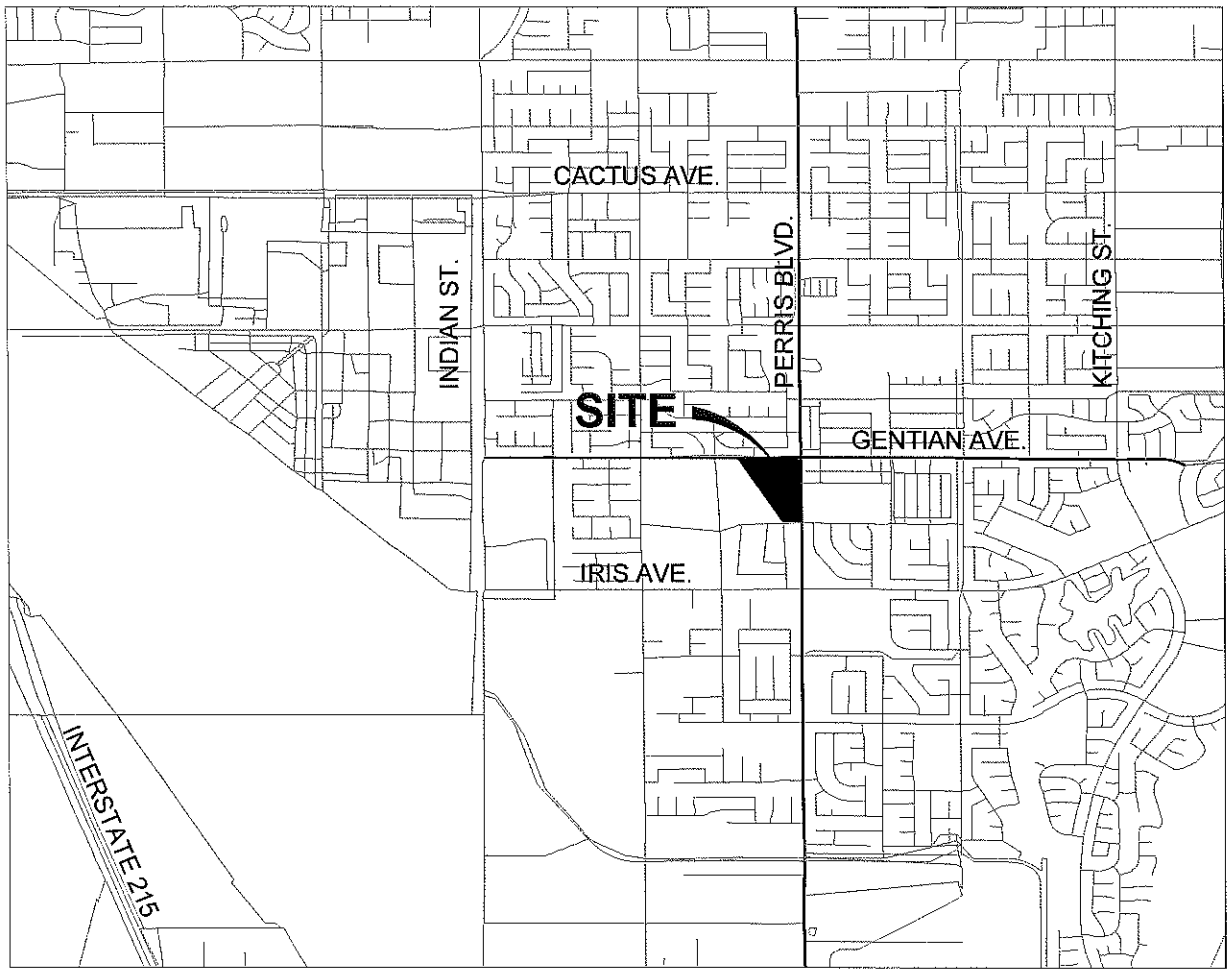
For our project site, the 100-year 24-hour storm event will not be used as a control case due to the fact that we have a large allowable Q value (26.00 cfs), a small project area, and a designed outlet pipe for the system. By examining the flood routing analysis results without an outlet pipe, we determined that only the 100-year, 6 hour runoff will be needed to re-analyze our system using an outlet pipe system. The flood routing analysis for this case was performed and can be found in Appendix J. The storage requirements for this case were determined to be less than the storage provided.

For the proposed fence design around the basin, the City Standard #, titled "Fence and gate," will be used for this project. Please see drawing in Appendix K.

The design details of the proposed detention basin will be carried out with the final drawings.

EXHIBIT 1

Location Map



VICINITY MAP

N.T.S.

K:\DEN_Civil\Orange Projects\094507003_Moreno Valley\CADD\x507113WM.dwg

Kimley-Horn and Associates, Inc.
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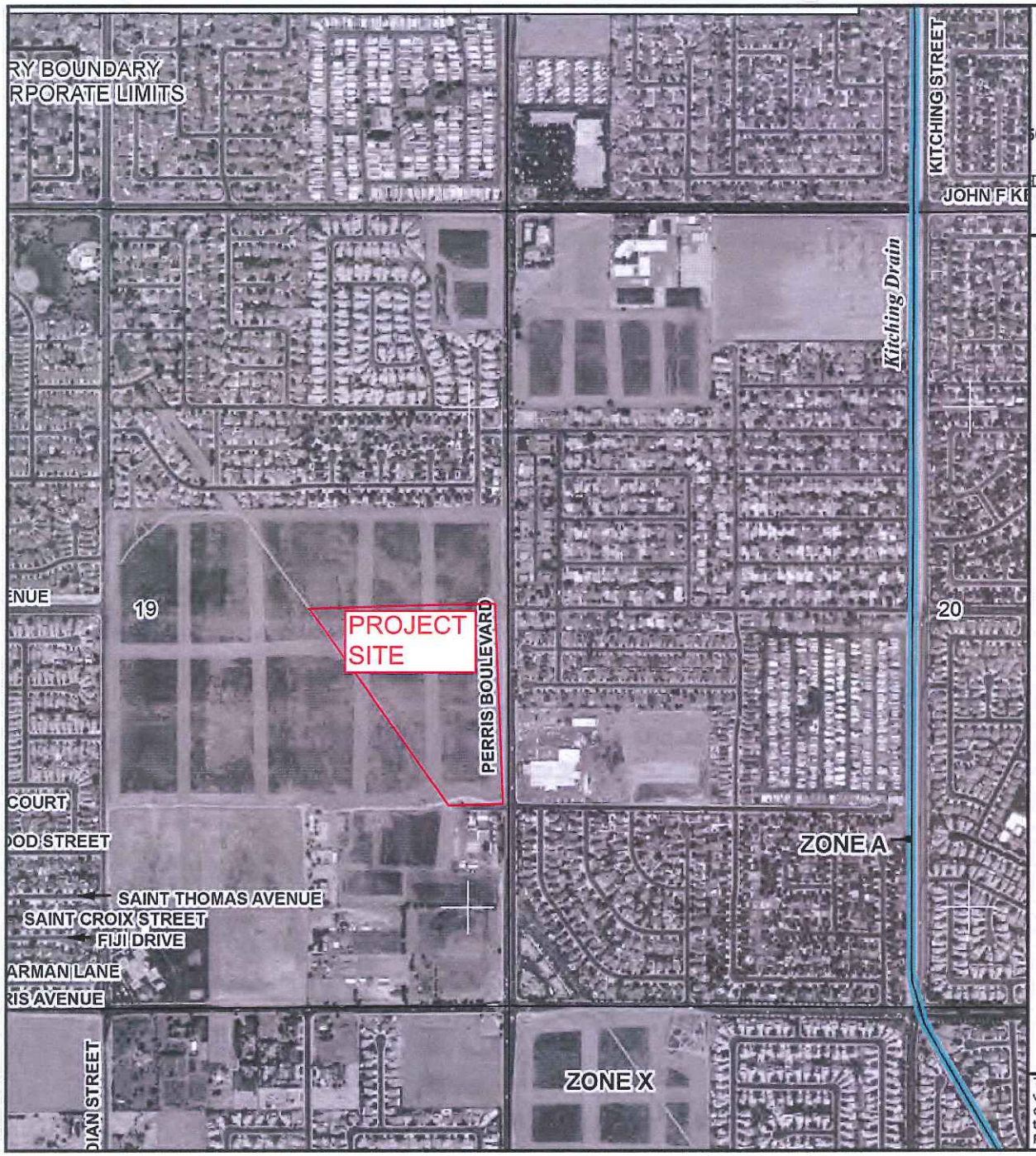
990 South Broadway, Suite 200
Denver, Colorado 80209 (303) 228-2300

EXHIBIT 2

FIRM Map



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0765G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 765 OF 3805
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MORENO VALLEY, CITY OF	065074	0765	G
RIVERSIDE COUNTY	060245	0765	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C0765G

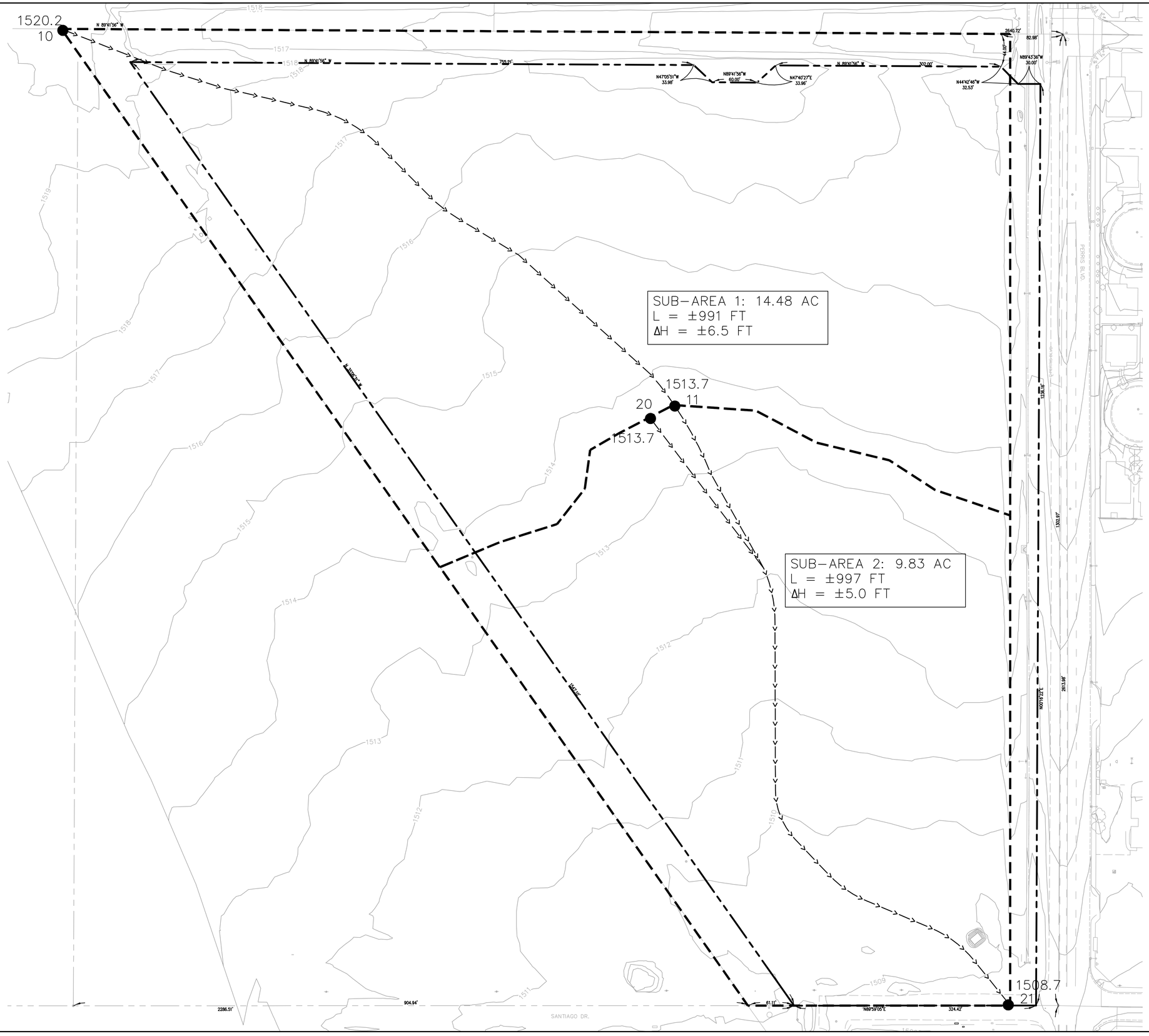
EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

EXHIBIT 3

Existing Drainage Map



NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

LEGEND

SITE DRAINAGE FLOW PATH

EXISTING WATERSHED BOUNDARY

EXISTING PROPERTY LINE

No.	REVISIONS	DATE

Kimley-Horn and Associates, Inc.
765 THE CITY DRIVE, SUITE 200, ORANGE, CA 92868
PHONE: 714-939-1030 FAX: 714-938-9488
WWW.KIMLEY-HORN.COM

DESIGN ENGINEER: KEVIN M. ROBERSON, P.E.
CALIFORNIA LICENSE NUMBER 74346
DATE: 10/9/2013

SCALE AS NOTED
DESIGNED BY LG
DRAWN BY LG
CHECKED BY KMC

PRE-DEVELOPMENT HYDROLOGY MAP

MORENO VALLEY, CA
SWC OF GENTAIN AVE AND PERRIS BLVD

DATE 10/9/2013
PROJECT NO. PA13-0032/ 0033/0034 P13-071
SHEET NUMBER 6250

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Kimley-Horn
and Associates, Inc.

EXHIBIT 4

Proposed Drainage Map

No.	REVISIONS	DATE

Kimley-Horn and Associates, Inc.
© 2013 KIMLEY-HORN AND ASSOCIATES, INC.
765 THE CITY DRIVE, SUITE 200, ORANGE, CA 92868
PHONE: 714-939-1030 FAX: 714-938-9488
WWW.KIMLEY-HORN.COM

DESIGN ENGINEER: KEVIN M. ROBERSON, P.E.
CALIFORNIA LICENSE NUMBER 74346
DATE: 10/9/2013

SCALE: AS NOTED
DESIGNED BY: LG
DRAWN BY: LG
CHECKED BY: KMC

POST-DEVELOPMENT DRAINAGE MAP

MORENO VALLEY, CA
SWC OF GENTAIN AVE AND PERRIS BLVD

DATE 10/9/13
PROJECT NO. PA13-0032/ 0033/0034 P13-071
SHEET NUMBER 6251

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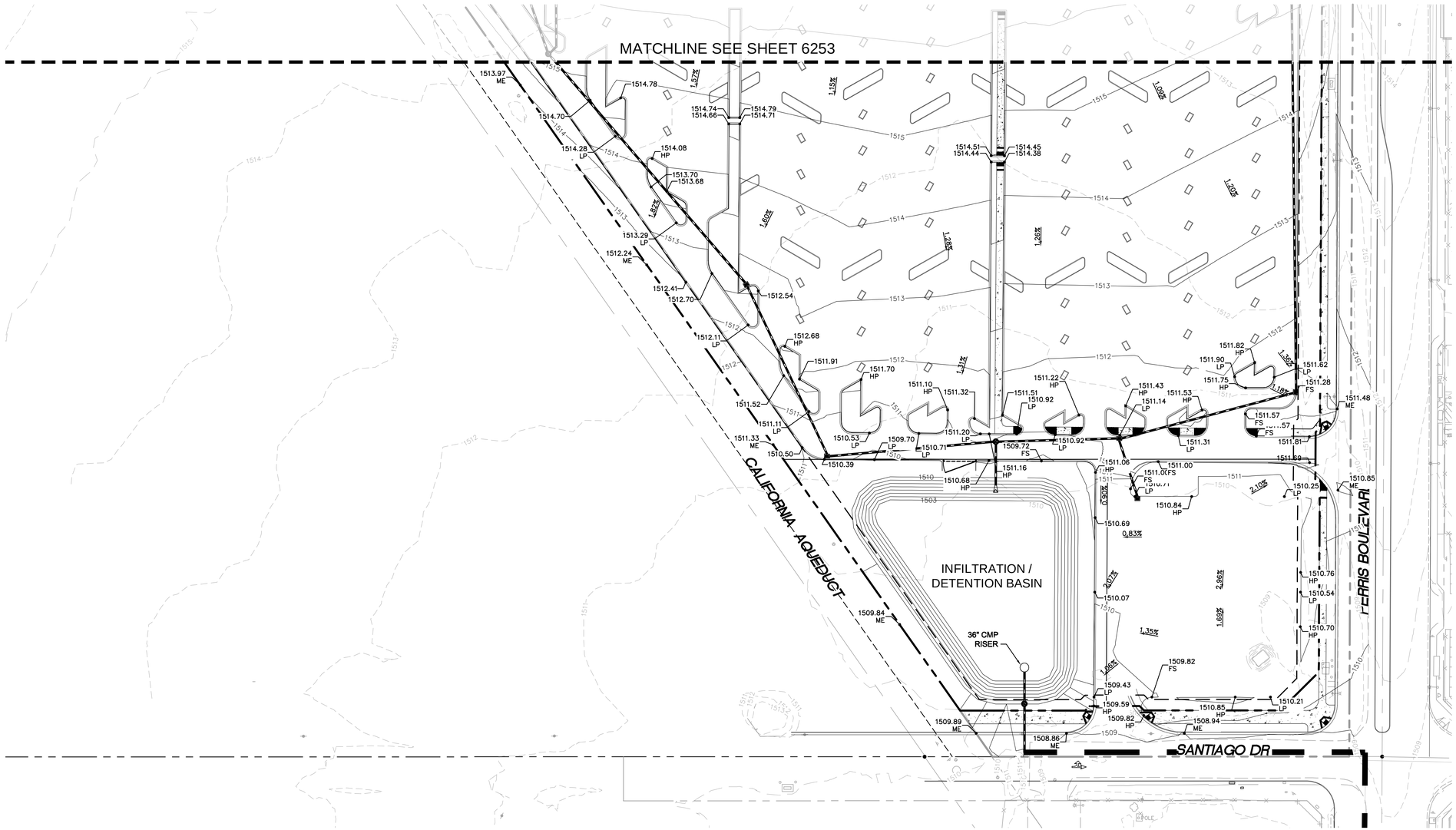
EXHIBIT 5

Preliminary Grading and Drainage Plans



NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

LEGEND

- EXISTING PROPERTY LINE TO REMAIN.
- EXISTING PROPERTY TO BE ABANDONED.
- PROPOSED RIGHT-OF-WAY LINE.
- XX EXISTING CONTOUR
- XX PROPOSED CONTOUR
- X.XX PROPOSED SLOPE
- X.XX PROPOSED SPOT GRADE
- PROPOSED STORM SEWER PIPE
- MATCHLINE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE

ABBREVIATION LEGEND

HP – HIGH POINT ELEVATION
LP – LOW POINT ELEVATION
ME – MATCH EXISTING ELEVATION

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT_FILL ANALYSIS	**1.000**	**1.000**	23.14acres	12020.50 Cu. Yd.	55158.25 Cu. Yd.	43137.74 Cu. Yd.<Fill>
Totals			23.14acres	12020.50 Cu. Yd.	55158.25 Cu. Yd.	43137.74 Cu. Yd.<Fill>

DIGALERT
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1-800-422-4133
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

ALERT TO CONTRACTOR:

1. THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS. REFER TO MASTER SITE SPECIFICATIONS.
2. ALL GENERAL CONTRACTOR WORK TO BE COMPLETED (EARTHWORK, FINAL UTILITIES, AND FINAL GRADING) BY THE MILESTONE DATE IN PROJECT DOCUMENTS. OUTLOT AREA TO BE KEPT FREE OF JOB TRAILERS AND STORAGE AFTER THE CONTRACT MILESTONE DATE FOR THE OUTLOT. WM GENERAL CONTRACTOR TO PROVIDE CLEAR ACCESS FOR OUTLOT CONTRACTOR TO THE SPECIFIC PARCEL AT ALL TIMES AFTER MILESTONE DATE. PURCHASER OF OUTLOT TO PROVIDE PERMIT DOCUMENTS AND SWPPP REQUIRED BY STATE/LOCAL REQUIREMENTS FOR SPECIFIC OUTLOT.

No.	REVISIONS	DATE

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DESIGN ENGINEER: KEVIN M. ROBERSON, P.E.
CALIFORNIA LICENSE NUMBER 74346
DATE: 10/9/2013

SCALE: AS NOTED
DESIGNED BY LG
DRAWN BY LG
CHECKED BY KMC

PRELIMINARY GRADING AND DRAINAGE PLAN (S)

MORENO VALLEY, CA
SWC OF GENTAIN AVE AND PERRIS BLVD

DATE 10/9/2013
PROJECT NO. PA13-0032/ 0033/0034 P13-071
SHEET NUMBER 6254

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APPENDIX A

Existing and Proposed Hydrology Calculations
10 Year Rainfall Frequency

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                  (Rational Tabling Version 18.0)
             Release Date: 07/01/2011  License ID 1499

                     Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION - 10 YEAR FREQUENCY                                 *
* PA13-0032                                                              *
* JULY 29, 2013                                                          *
 ************************************************************************

  FILE NAME: RA-10Y.DAT
  TIME/DATE OF STUDY: 10:44 07/29/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.828
  SLOPE OF INTENSITY DURATION CURVE = 0.5004
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
```

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   991.00
UPSTREAM ELEVATION(FEET) =   1520.20
DOWNSTREAM ELEVATION(FEET) =   1513.70
ELEVATION DIFFERENCE(FEET) =      6.50
TC = 0.533*[(  991.00**3)/(     6.50)]**.2 =   22.986
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.339
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5049
SOIL CLASSIFICATION IS "B"
SUBAREA RUNOFF(CFS) =      9.79
TOTAL AREA(ACRES) =     14.48   TOTAL RUNOFF(CFS) =      9.79

****************************************************************************
FLOW PROCESS FROM NODE     11.00 TO NODE     21.00 IS CODE =  52
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1513.70  DOWNSTREAM(FEET) =   1508.70
CHANNEL LENGTH THRU SUBAREA(FEET) =   997.00   CHANNEL SLOPE =  0.0050
CHANNEL FLOW THRU SUBAREA(CFS) =      9.79
FLOW VELOCITY(FEET/SEC) =   1.76 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   9.44   Tc(MIN.) =   32.43
LONGEST FLOWPATH FROM NODE     10.00 TO NODE     21.00 =    1988.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.127
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4664
SOIL CLASSIFICATION IS "B"
SUBAREA AREA(ACRES) =    9.84   SUBAREA RUNOFF(CFS) =    5.17
TOTAL AREA(ACRES) =       24.3   TOTAL RUNOFF(CFS) =      14.96
TC(MIN.) =   32.43
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =       24.3  TC(MIN.) =     32.43
PEAK FLOW RATE(CFS)   =      14.96
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

♀

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                  (Rational Tabling Version 18.0)
             Release Date: 07/01/2011  License ID 1499

                      Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 10 YEAR HYDROLOGY RESULTS                                                *
* MORENO VALLEY                                                            *
* JUNE 27, 2013                                                            *
 ****************************************************************************

  FILE NAME: MOV.DAT
  TIME/DATE OF STUDY: 11:36 06/27/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.828
  SLOPE OF INTENSITY DURATION CURVE = 0.5004
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   358.00
  UPSTREAM ELEVATION(FEET) =   1517.20
  DOWNSTREAM ELEVATION(FEET) =   1514.20
  ELEVATION DIFFERENCE(FEET) =      3.00
  TC = 0.303*[(  358.00**3)/(     3.00)]**.2 =    8.289
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.230
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8712
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.55
  TOTAL AREA(ACRES) =      1.31   TOTAL RUNOFF(CFS) =      2.55

******************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     37.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.40
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.87
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.55
  PIPE TRAVEL TIME(MIN.) =   3.06    Tc(MIN.) =   11.35
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     37.00 =     518.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     37.00 IS CODE =  10
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   260.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1515.50
  ELEVATION DIFFERENCE(FEET) =     14.50
  TC = 0.303*[(  260.00**3)/(    14.50)]**.2 =    4.992
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.872
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8759
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.77
  TOTAL AREA(ACRES) =      1.10   TOTAL RUNOFF(CFS) =      2.77

******************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.90
FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   0.88
ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       2.77
PIPE TRAVEL TIME(MIN.) =   2.08    Tc(MIN.) =    7.08
LONGEST FLOWPATH FROM NODE     35.00 TO NODE     37.00 =     370.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     37.00 TO NODE     37.00 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        2.77     7.08       2.413        1.10
LONGEST FLOWPATH FROM NODE     35.00 TO NODE     37.00 =     370.00 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY     AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        2.55    11.35       1.905        1.31
LONGEST FLOWPATH FROM NODE     30.00 TO NODE     37.00 =     518.00 FEET.

**********************************WARNING**********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
***************************************************************************

** PEAK FLOW RATE TABLE **
STREAM    RUNOFF      Tc      INTENSITY
NUMBER     (CFS)    (MIN.)   (INCH/HOUR)
    1       4.35     7.08       2.413
    2       4.73    11.35       1.905

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =       4.35   Tc(MIN.) =    7.08
TOTAL AREA(ACRES) =        2.4

****************************************************************************
FLOW PROCESS FROM NODE     37.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.00
FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   0.99
ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       4.35
PIPE TRAVEL TIME(MIN.) =   3.35    Tc(MIN.) =   10.44
LONGEST FLOWPATH FROM NODE     30.00 TO NODE     41.00 =     718.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.987
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8689
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.35   SUBAREA RUNOFF(CFS) =    2.33
  TOTAL AREA(ACRES) =        3.8   TOTAL RUNOFF(CFS) =       6.69
  TC(MIN.) =   10.44

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1516.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  TC = 0.303*[(  300.00**3)/(    14.00)]**.2 =    5.478
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.743
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8751
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.26
  TOTAL AREA(ACRES) =      0.94   TOTAL RUNOFF(CFS) =      2.26

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.82
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.26
  PIPE TRAVEL TIME(MIN.) =   2.03    Tc(MIN.) =    7.51
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 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         2.26      7.51        2.344         0.94
 LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     400.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1         6.69     10.44        1.987         3.76
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     41.00 =     718.00 FEET.

*********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
*************************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1        7.07      7.51        2.344
    2        8.60     10.44        1.987

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       8.60   Tc(MIN.) =   10.44
 TOTAL AREA(ACRES) =        4.7

*************************************************************************
 FLOW PROCESS FROM NODE     41.00 TO NODE     81.00 IS CODE =  31
-------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    95.00
 FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   1.17
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.60
 PIPE TRAVEL TIME(MIN.) =   7.10    Tc(MIN.) =   17.53
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     81.00 =    1218.00 FEET.

*************************************************************************
 FLOW PROCESS FROM NODE     81.00 TO NODE     81.00 IS CODE =  81
-------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=========================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.533
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8635
 SOIL CLASSIFICATION IS "B"
 SUBAREA AREA(ACRES) =     2.60   SUBAREA RUNOFF(CFS) =     3.44
 TOTAL AREA(ACRES) =        7.3   TOTAL RUNOFF(CFS) =      12.04
 TC(MIN.) =   17.53

*************************************************************************
 FLOW PROCESS FROM NODE     81.00 TO NODE     71.00 IS CODE =  31
-------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.20
```

```
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  36.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.25
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.04
  PIPE TRAVEL TIME(MIN.) =   2.40    Tc(MIN.) =   19.93
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     71.00 =    1398.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     71.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.437
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8621
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.50   SUBAREA RUNOFF(CFS) =    1.86
  TOTAL AREA(ACRES) =        8.8   TOTAL RUNOFF(CFS) =      13.90
  TC(MIN.) =   19.93

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     71.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     90.00 TO NODE     91.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =   1511.00
  DOWNSTREAM ELEVATION(FEET) =   1509.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.303*[(  200.00**3)/(     2.00)]**.2 =    6.339
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.550
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8738
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      3.21
  TOTAL AREA(ACRES) =      1.44   TOTAL RUNOFF(CFS) =      3.21

****************************************************************************
  FLOW PROCESS FROM NODE     91.00 TO NODE     71.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.92
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.21
  PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =    7.24
  LONGEST FLOWPATH FROM NODE     90.00 TO NODE     71.00 =     250.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     71.00 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         3.21     7.24       2.386        1.44
  LONGEST FLOWPATH FROM NODE     90.00 TO NODE     71.00 =     250.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        13.90    19.93       1.437        8.80
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     71.00 =    1398.00 FEET.

 ***********************************WARNING***********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1        8.26      7.24        2.386
     2       15.83     19.93        1.437

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.83   Tc(MIN.) =   19.93
  TOTAL AREA(ACRES) =       10.2

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 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) =   100.00  DOWNSTREAM(FEET) =    99.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  39.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.35
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.83
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =   20.55
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE    100.00 =    1448.00 FEET.

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

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

```
****************************************************************************
  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    100.00 TO NODE    100.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
  UPSTREAM ELEVATION(FEET) =   1517.20
  DOWNSTREAM ELEVATION(FEET) =   1515.80
  ELEVATION DIFFERENCE(FEET) =      1.40
  TC = 0.303*[(  290.00**3)/(     1.40)]**.2 =    8.508
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.201
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8710
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      1.05   TOTAL RUNOFF(CFS) =      2.01

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE      7.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.81
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   2.05    Tc(MIN.) =   10.56
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE      7.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      7.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS COMMERCIAL
```

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
UPSTREAM ELEVATION(FEET) =   1530.00
DOWNSTREAM ELEVATION(FEET) =   1518.00
ELEVATION DIFFERENCE(FEET) =     12.00
TC = 0.303*[(  250.00**3)/(    12.00)]**.2 =    5.064
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.853
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8758
SOIL CLASSIFICATION IS "B"
SUBAREA RUNOFF(CFS) =      2.60
TOTAL AREA(ACRES) =      1.04   TOTAL RUNOFF(CFS) =      2.60

****************************************************************************
FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.20
FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   0.87
ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       2.60
PIPE TRAVEL TIME(MIN.) =   1.53    Tc(MIN.) =    6.59
LONGEST FLOWPATH FROM NODE      5.00 TO NODE      7.00 =     330.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      7.00 TO NODE      7.00 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        2.60     6.59       2.501        1.04
LONGEST FLOWPATH FROM NODE      5.00 TO NODE      7.00 =     330.00 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY     AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        2.01    10.56       1.976        1.05
LONGEST FLOWPATH FROM NODE     20.00 TO NODE      7.00 =     390.00 FEET.

*********************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
***************************************************************************

** PEAK FLOW RATE TABLE **
STREAM    RUNOFF       Tc      INTENSITY
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1       3.86       6.59       2.501
    2       4.07      10.56       1.976

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =       3.86   Tc(MIN.) =    6.59
TOTAL AREA(ACRES) =        2.1
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    97.90
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.95
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.86
  PIPE TRAVEL TIME(MIN.) =   3.68    Tc(MIN.) =   10.27
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE      8.00 =     600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   348.00
  UPSTREAM ELEVATION(FEET) =   1517.00
  DOWNSTREAM ELEVATION(FEET) =   1513.40
  ELEVATION DIFFERENCE(FEET) =      3.60
  TC = 0.303*[(  348.00**3)/(     3.60)]**.2 =    7.857
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.290
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8718
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      6.21
  TOTAL AREA(ACRES) =      3.11   TOTAL RUNOFF(CFS) =      6.21

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.20
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.07
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.21
  PIPE TRAVEL TIME(MIN.) =   2.80    Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE      8.00 =     528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 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         6.21    10.66        1.966       3.11
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE      8.00 =     528.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
    1         3.86    10.27        2.003       2.09
 LONGEST FLOWPATH FROM NODE     20.00 TO NODE      8.00 =     600.00 FEET.

****************************************WARNING*****************************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****************************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1        9.84      10.27        2.003
    2       10.00      10.66        1.966

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       10.00   Tc(MIN.) =   10.66
 TOTAL AREA(ACRES) =         5.2

****************************************************************************
 FLOW PROCESS FROM NODE      8.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    97.00
 FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  34.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   1.19
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.00
 PIPE TRAVEL TIME(MIN.) =   4.19    Tc(MIN.) =   14.85
 LONGEST FLOWPATH FROM NODE     20.00 TO NODE     47.00 =     900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  10
----------------------------------------------------------------------------
```

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

******************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1517.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  TC = 0.303*[(  250.00**3)/(    13.00)]**.2 =    4.984
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.872
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8759
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.97
  TOTAL AREA(ACRES) =      1.18   TOTAL RUNOFF(CFS) =      2.97

******************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     47.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.89
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.97
  PIPE TRAVEL TIME(MIN.) =   3.76    Tc(MIN.) =    8.76
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     47.00 =     450.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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         2.97     8.76       2.169        1.18
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     47.00 =     450.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
     1        10.00    14.85       1.666        5.20
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     47.00 =     900.00 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
```

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

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1        8.86       8.76        2.169
    2       12.27      14.85        1.666

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       12.27   Tc(MIN.) =   14.85
 TOTAL AREA(ACRES) =         6.4

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 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) =   100.00  DOWNSTREAM(FEET) =    97.20
 FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   1.28
 ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       12.27
 PIPE TRAVEL TIME(MIN.) =   3.63    Tc(MIN.) =   18.48
 LONGEST FLOWPATH FROM NODE     20.00 TO NODE     51.00 =    1180.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     51.00 TO NODE     51.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.493
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8629
 SOIL CLASSIFICATION IS "B"
 SUBAREA AREA(ACRES) =    1.25   SUBAREA RUNOFF(CFS) =    1.61
 TOTAL AREA(ACRES) =        7.6   TOTAL RUNOFF(CFS) =      13.88
 TC(MIN.) =   18.48

****************************************************************************
 FLOW PROCESS FROM NODE     51.00 TO NODE     61.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.50
 FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  38.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   1.30
 ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       13.88
 PIPE TRAVEL TIME(MIN.) =   1.92    Tc(MIN.) =   20.40
 LONGEST FLOWPATH FROM NODE     20.00 TO NODE     61.00 =    1330.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     61.00 TO NODE     61.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.421
```

```
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8618
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    3.40   SUBAREA RUNOFF(CFS) =    4.16
  TOTAL AREA(ACRES) =       11.0   TOTAL RUNOFF(CFS) =      18.05
  TC(MIN.) =   20.40

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 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) =   100.00  DOWNSTREAM(FEET) =    98.30
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  40.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.40
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.05
  PIPE TRAVEL TIME(MIN.) =   2.02    Tc(MIN.) =   22.42
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE    100.00 =    1500.00 FEET.

****************************************************************************
  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       18.05    22.42       1.355       11.03
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE    100.00 =    1500.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       15.83    20.55       1.416       10.24
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE    100.00 =    1448.00 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      32.37      20.55       1.416
     2      33.20      22.42       1.355

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.20   Tc(MIN.) =   22.42
  TOTAL AREA(ACRES) =       21.3
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       21.3  TC(MIN.) =     22.42
  PEAK FLOW RATE(CFS)   =      33.20
============================================================================
============================================================================
```

END OF RATIONAL METHOD ANALYSIS

Kimley-Horn
and Associates, Inc.

APPENDIX B

Existing and Proposed Hydrology Calculations
100 Year Rainfall Frequency

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                   (Rational Tabling Version 18.0)
              Release Date: 07/01/2011  License ID 1499

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* EXISTING CONDITION - 100 YEAR FREQUENCY                                  *
* PA13-0032 WM IN MORENO VALLEY                                            *
* JULY 29, 2013                                                            *
 ****************************************************************************

  FILE NAME: RA-100Y.DAT
  TIME/DATE OF STUDY: 10:57 07/29/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
```

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   991.00
UPSTREAM ELEVATION(FEET) =   1520.20
DOWNSTREAM ELEVATION(FEET) =   1513.70
ELEVATION DIFFERENCE(FEET) =      6.50
TC = 0.533*[(  991.00**3)/(     6.50)]**.2 =   22.986
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.939
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5843
SOIL CLASSIFICATION IS "B"
SUBAREA RUNOFF(CFS) =     16.41
TOTAL AREA(ACRES) =     14.48   TOTAL RUNOFF(CFS) =     16.41

****************************************************************************
FLOW PROCESS FROM NODE     11.00 TO NODE     21.00 IS CODE =  52
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1513.70  DOWNSTREAM(FEET) =   1508.70
CHANNEL LENGTH THRU SUBAREA(FEET) =   997.00   CHANNEL SLOPE =  0.0050
CHANNEL FLOW THRU SUBAREA(CFS) =      16.41
FLOW VELOCITY(FEET/SEC) =   2.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   8.26   Tc(MIN.) =   31.24
LONGEST FLOWPATH FROM NODE     10.00 TO NODE     21.00 =    1988.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.663
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5522
SOIL CLASSIFICATION IS "B"
SUBAREA AREA(ACRES) =    9.84   SUBAREA RUNOFF(CFS) =    9.04
TOTAL AREA(ACRES) =      24.3   TOTAL RUNOFF(CFS) =     25.44
TC(MIN.) =   31.24
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =      24.3  TC(MIN.) =     31.24
PEAK FLOW RATE(CFS)    =     25.44
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

♀

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                  (Rational Tabling Version 18.0)
              Release Date: 07/01/2011  License ID 1499

                       Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 100 YEAR HYDROLOGY RESULTS                                               *
* MORENO VALLEY                                                            *
* JUNE 27, 2013                                                            *
 ***************************************************************************

  FILE NAME: MOV.DAT
  TIME/DATE OF STUDY: 11:43 06/27/2013
---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
---------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     30.00 TO NODE     31.00 IS CODE =  21
---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   358.00
  UPSTREAM ELEVATION(FEET) =   1517.20
  DOWNSTREAM ELEVATION(FEET) =   1514.20
  ELEVATION DIFFERENCE(FEET) =      3.00
  TC = 0.303*[(  358.00**3)/(     3.00)]**.2 =    8.289
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.229
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8780
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      3.71
  TOTAL AREA(ACRES) =      1.31   TOTAL RUNOFF(CFS) =      3.71

******************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     37.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.40
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.95
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.71
  PIPE TRAVEL TIME(MIN.) =   2.82    Tc(MIN.) =   11.10
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     37.00 =     518.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     37.00 IS CODE =  10
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   260.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1515.50
  ELEVATION DIFFERENCE(FEET) =     14.50
  TC = 0.303*[(  260.00**3)/(    14.50)]**.2 =    4.992
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.158
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8819
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      4.03
  TOTAL AREA(ACRES) =      1.10   TOTAL RUNOFF(CFS) =      4.03

******************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.90
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.95
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.03
  PIPE TRAVEL TIME(MIN.) =   1.93    Tc(MIN.) =    6.93
  LONGEST FLOWPATH FROM NODE     35.00 TO NODE     37.00 =     370.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     37.00 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        4.03     6.93       3.533        1.10
  LONGEST FLOWPATH FROM NODE     35.00 TO NODE     37.00 =     370.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        3.71    11.10       2.790        1.31
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     37.00 =     518.00 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)    (MIN.)   (INCH/HOUR)
     1       6.35      6.93       3.533
     2       6.90     11.10       2.790

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.35   Tc(MIN.) =    6.93
  TOTAL AREA(ACRES) =        2.4

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.07
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.35
  PIPE TRAVEL TIME(MIN.) =   3.10    Tc(MIN.) =   10.03
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     41.00 =     718.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.935
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8763
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.35   SUBAREA RUNOFF(CFS) =    3.47
  TOTAL AREA(ACRES) =        3.8   TOTAL RUNOFF(CFS) =       9.82
  TC(MIN.) =   10.03

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1516.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  TC = 0.303*[(  300.00**3)/(    14.00)]**.2 =    5.478
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.972
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8812
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      3.29
  TOTAL AREA(ACRES) =      0.94   TOTAL RUNOFF(CFS) =      3.29

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.93
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.29
  PIPE TRAVEL TIME(MIN.) =   1.79    Tc(MIN.) =    7.27
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 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         3.29      7.27       3.448         0.94
LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     400.00 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
STREAM     RUNOFF       Tc       INTENSITY      AREA
NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1         9.82     10.03       2.935         3.76
LONGEST FLOWPATH FROM NODE     30.00 TO NODE     41.00 =     718.00 FEET.

*********************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
*************************************************************************

** PEAK FLOW RATE TABLE **
STREAM    RUNOFF       Tc       INTENSITY
NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1      10.41      7.27        3.448
    2      12.62     10.03        2.935

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      12.62   Tc(MIN.) =   10.03
TOTAL AREA(ACRES) =        4.7

*************************************************************************
FLOW PROCESS FROM NODE     41.00 TO NODE     81.00 IS CODE =  31
-------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=========================================================================
ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    95.00
FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   1.29
ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      12.62
PIPE TRAVEL TIME(MIN.) =   6.46    Tc(MIN.) =   16.49
LONGEST FLOWPATH FROM NODE     30.00 TO NODE     81.00 =    1218.00 FEET.

*************************************************************************
FLOW PROCESS FROM NODE     81.00 TO NODE     81.00 IS CODE =  81
-------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=========================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.289
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8717
SOIL CLASSIFICATION IS "B"
SUBAREA AREA(ACRES) =    2.60   SUBAREA RUNOFF(CFS) =    5.19
TOTAL AREA(ACRES) =        7.3   TOTAL RUNOFF(CFS) =      17.81
TC(MIN.) =   16.49

*************************************************************************
FLOW PROCESS FROM NODE     81.00 TO NODE     71.00 IS CODE =  31
-------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=========================================================================
ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.20
```

```
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  40.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.40
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.81
  PIPE TRAVEL TIME(MIN.) =   2.14    Tc(MIN.) =   18.64
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     71.00 =    1398.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     71.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.153
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8705
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.50   SUBAREA RUNOFF(CFS) =    2.81
  TOTAL AREA(ACRES) =        8.8   TOTAL RUNOFF(CFS) =      20.63
  TC(MIN.) =   18.64

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     71.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     90.00 TO NODE     91.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =   1511.00
  DOWNSTREAM ELEVATION(FEET) =   1509.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.303*[(  200.00**3)/(     2.00)]**.2 =    6.339
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.693
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8801
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      4.68
  TOTAL AREA(ACRES) =      1.44   TOTAL RUNOFF(CFS) =      4.68

****************************************************************************
  FLOW PROCESS FROM NODE     91.00 TO NODE     71.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.01
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.68
  PIPE TRAVEL TIME(MIN.) =   0.83    Tc(MIN.) =    7.17
  LONGEST FLOWPATH FROM NODE     90.00 TO NODE     71.00 =     250.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     71.00 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         4.68     7.17       3.473        1.44
  LONGEST FLOWPATH FROM NODE     90.00 TO NODE     71.00 =     250.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        20.63    18.64       2.153        8.80
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     71.00 =    1398.00 FEET.

 ***********************************WARNING***********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      12.61       7.17       3.473
     2      23.53      18.64       2.153

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.53   Tc(MIN.) =   18.64
  TOTAL AREA(ACRES) =       10.2

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 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) =   100.00  DOWNSTREAM(FEET) =    99.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  44.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.50
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.53
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   19.19
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE    100.00 =    1448.00 FEET.

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

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

```
****************************************************************************
  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    100.00 TO NODE    100.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
  UPSTREAM ELEVATION(FEET) =   1517.20
  DOWNSTREAM ELEVATION(FEET) =   1515.80
  ELEVATION DIFFERENCE(FEET) =      1.40
  TC = 0.303*[(  290.00**3)/(     1.40)]**.2 =    8.508
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.188
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8777
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.94
  TOTAL AREA(ACRES) =      1.05   TOTAL RUNOFF(CFS) =      2.94

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE      7.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.89
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.94
  PIPE TRAVEL TIME(MIN.) =   1.88    Tc(MIN.) =   10.39
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE      7.00 =     390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      7.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
```

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
UPSTREAM ELEVATION(FEET) =   1530.00
DOWNSTREAM ELEVATION(FEET) =   1518.00
ELEVATION DIFFERENCE(FEET) =     12.00
TC = 0.303*[(  250.00**3)/(    12.00)]**.2 =    5.064
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.132
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8818
SOIL CLASSIFICATION IS "B"
SUBAREA RUNOFF(CFS) =      3.79
TOTAL AREA(ACRES) =      1.04   TOTAL RUNOFF(CFS) =      3.79

****************************************************************************
FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    99.20
FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   0.95
ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       3.79
PIPE TRAVEL TIME(MIN.) =   1.41    Tc(MIN.) =    6.47
LONGEST FLOWPATH FROM NODE      5.00 TO NODE      7.00 =     330.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      7.00 TO NODE      7.00 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        3.79     6.47       3.655        1.04
LONGEST FLOWPATH FROM NODE      5.00 TO NODE      7.00 =     330.00 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY     AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        2.94    10.39       2.884        1.05
LONGEST FLOWPATH FROM NODE     20.00 TO NODE      7.00 =     390.00 FEET.

*********************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
***************************************************************************

** PEAK FLOW RATE TABLE **
STREAM    RUNOFF       Tc      INTENSITY
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1       5.62       6.47       3.655
    2       5.93      10.39       2.884

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =       5.62   Tc(MIN.) =    6.47
TOTAL AREA(ACRES) =        2.1
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    97.90
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.06
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.62
  PIPE TRAVEL TIME(MIN.) =   3.31    Tc(MIN.) =    9.78
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE      8.00 =     600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   348.00
  UPSTREAM ELEVATION(FEET) =   1517.00
  DOWNSTREAM ELEVATION(FEET) =   1513.40
  ELEVATION DIFFERENCE(FEET) =      3.60
  TC = 0.303*[(  348.00**3)/(     3.60)]**.2 =    7.857
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.317
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8784
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      9.06
  TOTAL AREA(ACRES) =      3.11   TOTAL RUNOFF(CFS) =      9.06

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.20
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.18
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.06
  PIPE TRAVEL TIME(MIN.) =   2.54    Tc(MIN.) =   10.39
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE      8.00 =     528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 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         9.06    10.39        2.884        3.11
  LONGEST FLOWPATH FROM NODE      10.00 TO NODE      8.00 =     528.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM      RUNOFF      Tc       INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
     1         5.62     9.78        2.973        2.09
  LONGEST FLOWPATH FROM NODE      20.00 TO NODE      8.00 =     600.00 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ******************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
     1       14.15       9.78        2.973
     2       14.51      10.39        2.884

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       14.51   Tc(MIN.) =   10.39
  TOTAL AREA(ACRES) =         5.2

******************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE     47.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    97.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.34
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.51
  PIPE TRAVEL TIME(MIN.) =   3.74    Tc(MIN.) =   14.13
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     47.00 =     900.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  12
------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  12
------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  10
------------------------------------------------------------------------------
```

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

******************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1530.00
  DOWNSTREAM ELEVATION(FEET) =   1517.00
  ELEVATION DIFFERENCE(FEET) =     13.00
  TC = 0.303*[(  250.00**3)/(    13.00)]**.2 =    4.984
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.158
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8819
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      4.33
  TOTAL AREA(ACRES) =      1.18   TOTAL RUNOFF(CFS) =      4.33

******************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     47.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.99
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.33
  PIPE TRAVEL TIME(MIN.) =   3.36    Tc(MIN.) =    8.36
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     47.00 =     450.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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         4.33     8.36       3.216        1.18
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     47.00 =     450.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        14.51    14.13       2.473        5.20
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     47.00 =     900.00 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
```

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
      1       12.91      8.36        3.216
      2       17.84     14.13        2.473

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       17.84   Tc(MIN.) =   14.13
  TOTAL AREA(ACRES) =         6.4

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 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) =   100.00  DOWNSTREAM(FEET) =    97.20
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  40.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.40
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       17.84
  PIPE TRAVEL TIME(MIN.) =   3.33    Tc(MIN.) =   17.46
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     51.00 =    1180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     51.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8712
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.25   SUBAREA RUNOFF(CFS) =    2.42
  TOTAL AREA(ACRES) =        7.6   TOTAL RUNOFF(CFS) =      20.26
  TC(MIN.) =   17.46

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     61.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.50
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  42.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.45
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       20.26
  PIPE TRAVEL TIME(MIN.) =   1.73    Tc(MIN.) =   19.19
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     61.00 =    1330.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     61.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.122
```

```
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8703
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =     3.40   SUBAREA RUNOFF(CFS) =     6.28
  TOTAL AREA(ACRES) =        11.0   TOTAL RUNOFF(CFS) =      26.54
  TC(MIN.) =   19.19

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 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) =   100.00  DOWNSTREAM(FEET) =    98.30
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  46.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.55
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.54
  PIPE TRAVEL TIME(MIN.) =   1.83    Tc(MIN.) =   21.01
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE    100.00 =    1500.00 FEET.

****************************************************************************
  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       26.54    21.01       2.028       11.03
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE    100.00 =    1500.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       23.53    19.19       2.122       10.24
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE    100.00 =    1448.00 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      47.77      19.19       2.122
     2      49.03      21.01       2.028

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.03   Tc(MIN.) =   21.01
  TOTAL AREA(ACRES) =       21.3
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       21.3  TC(MIN.) =     21.01
  PEAK FLOW RATE(CFS)    =      49.03
============================================================================
============================================================================
```

END OF RATIONAL METHOD ANALYSIS

APPENDIX C

Riverside County Hydrology Reference Material

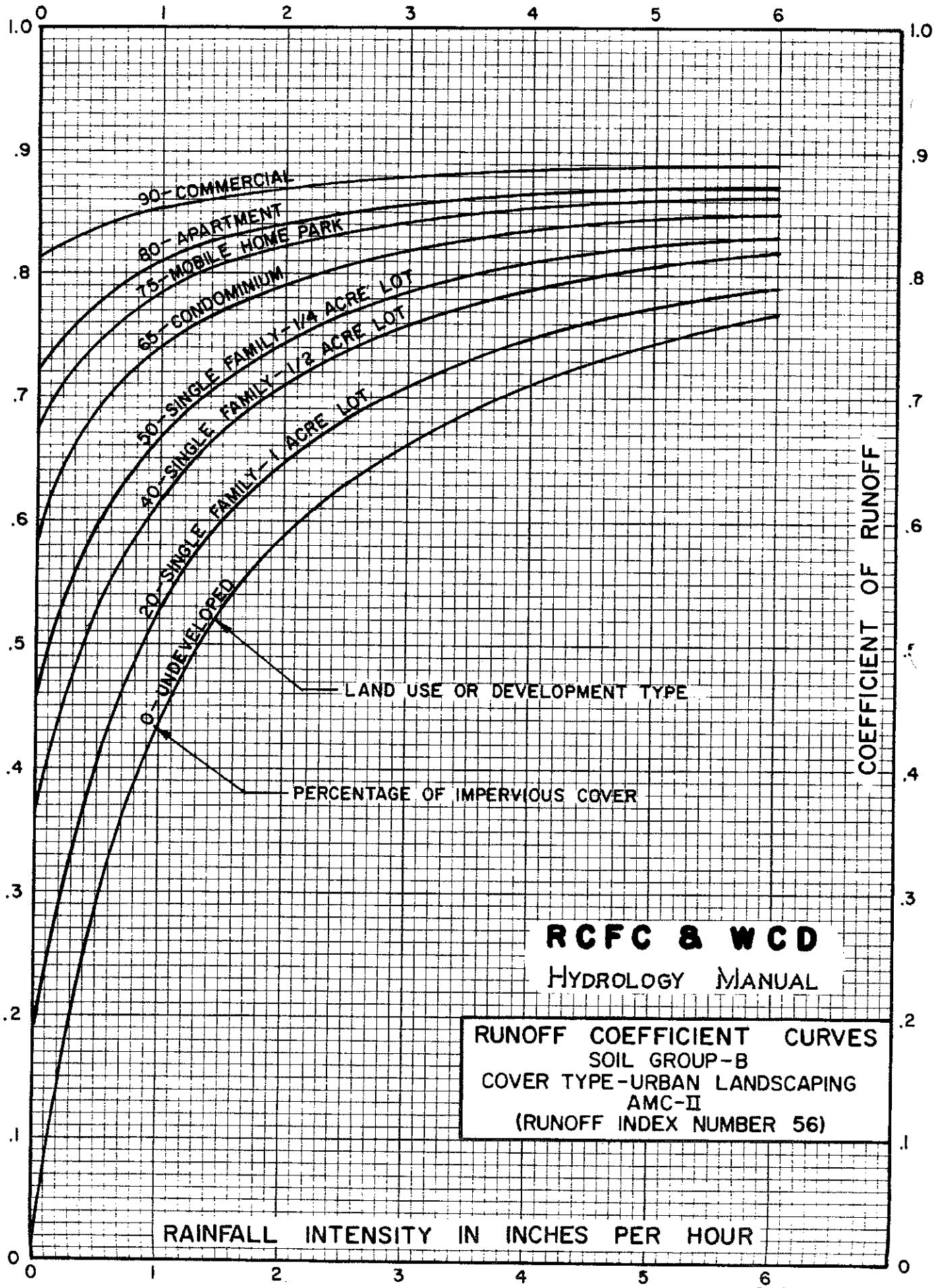
- **USDA Soils Map and Description**
- **RCRC&WCD Hydrologic Soils Group Descriptions (Plat C-2)**
- **RCRC&WCD Hydrologic Soils Group Map (Plate C-1.17)**
- **RCRC&WCD Runoff Index Numbers (Plate D-4.1)**
- **RCRC&WCD Runoff Coefficient Curves (Plate D5.2)**
- **RCRC&WCD Runoff Index Numbers (Plate D-5.5)**

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA



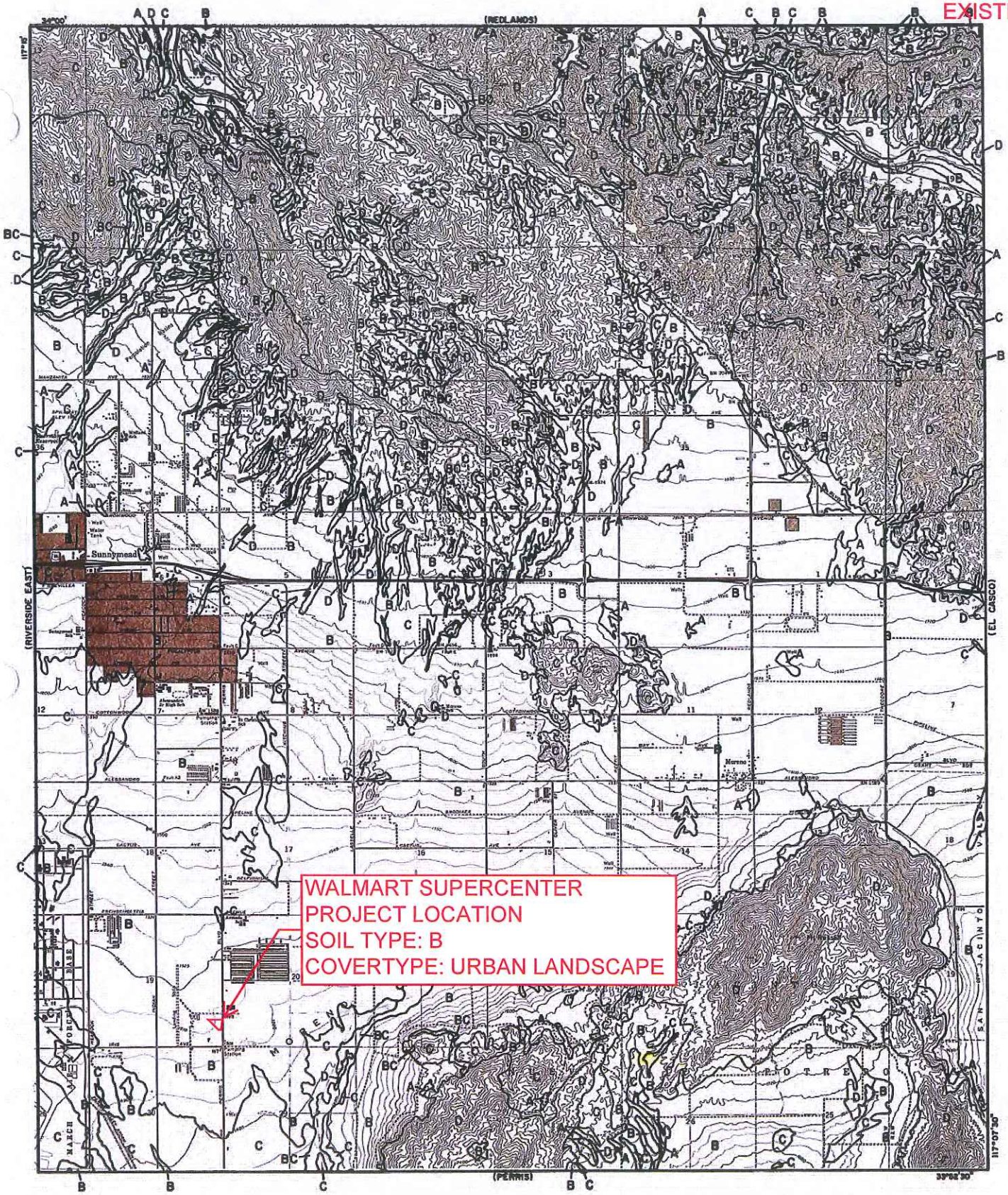
RCFC & WCD

HYDROLOGY MANUAL

RUNOFF COEFFICIENT CURVES
SOIL GROUP-B
COVER TYPE-URBAN LANDSCAPING
AMC-II
(RUNOFF INDEX NUMBER 56)

PLATE D-5.2

EXISTING



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR SUNNYMEAD

PLATE C-1.17

Soil Map—Western Riverside Area, California
(Moreno Valley, CA)

Map Scale: 1:3,040 if printed on A size (8.5" x 11") sheet.

N

Meters
0 25 50 100 150

Feet
0 100 200 400 600

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

- Gully
- Short Steep Slope
- Other

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:3,040 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 11N NAD83

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

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 5, Jan 3, 2008

Date(s) aerial images were photographed: 6/7/2005

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.

Map Unit Legend

Western Riverside Area, California (CA679)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
GyA	Greenfield sandy loam, 0 to 2 percent slopes	20.8	84.4%
HcA	Hanford coarse sandy loam, 0 to 2 percent slopes	2.0	8.2%
HgA	Hanford fine sandy loam, 0 to 2 percent slopes	1.8	7.3%
Totals for Area of Interest		**24.6**	**100.0%**

APPENDIX D

Technical Memorandum

Date: **November 9, 2012**

To: **Jason Keller, Mission Pacific**

From: **Joseph L. Castaneda, P.E.**

Re: **Line M2 Storm Drain Analysis and Basin Evaluation**

On behalf of Mission Pacific, JLC Engineering was retained to evaluate the existing Line M2 drainage facility and watershed that is tributary to current upstream terminus of Line M2. JLC Engineering performed the following tasks related to Line M2:

- Research the Line M2 MDP design data.
- Obtain improvement plans for Line M2.
- Perform a preliminary hydraulic analysis for Line M2.

Additionally, JLC Engineering was requested to perform preliminary basin sizing for the proposed 22 acre commercial site and Mission Pacific residential development.

Prior to beginning the study, JLC obtained the tributary area that was delineated to drain into the Line M2 facility. The map indicated that a total area of 156 acres of area were defined for Lateral M2. However, based on reviewing the current developed condition that exist a total of 164.9 acres drains to Line M2. The increase in area can be attributed to the existing tract at the intersection of Kitching Street and Iris Avenue sending an approximate 10 acre area that was not tabulated to enter Line M2.

The existing Line M2 MDP facility has been designed for a flow rate that ranges from 125 ft^3/s at the downstream terminus to 110 ft^3/s at the upstream terminus. Based on the hydraulic grade line shown on the plan the water surface elevation is approximately 1495.9. This was compared to a WSPG prepared for the Line M2 “as-built” condition. The as-built condition WSPG results in a water surface elevation of 1494.6. The change in water surface elevation can be attributed to the as-built condition using a 54” Cast-In-Place Pipe rather than a 51” RCP. However, it should be noted that the project defined as Area A14, A15, and A16 most likely were designated to flow along Iris and into Kitching Channel along the surface. This opinion is made for the following reason:

The catch basins and lateral designed for area A15, along Wedow Drive have an invert elevation of 1492.84. The catch basin depths show a "V" dimension, which is measured from the top of curb to the storm drain invert, of 4 feet. This suggest that the top of curb elevation for the catch basins would be 1496.84 and the flow line would be at 1496.0. This is approximately 0.1 feet higher than the water surface elevation shown on the plans of 1495.9 feet. Based on the hydraulic analyses for Line M2, it is JLC's opinion that the flow rate of 110.0 ft^3/s shown on the Line M2 plans emanates from the upstream properties west of Perris and north of Iris Avenue, defined as Areas A1-A13. Areas A14, A15, and A16 can contribute a maximum of 15 ft^3/s to Line M2. The residual flow rate was most likely designed to flow along Iris Avenue and into the Kitching Channel. The WSPG file has been included as part of Appendix A.

After the Line M2 facility was evaluated, the hydrology for the upstream properties were assessed to understand the maximum flow that can be contributed by Areas A1-A13, see Hydrology Map. A rational method analysis was prepared for two conditions:

1. A rational method hydrology using the MDP Land Use assumptions.
2. A rational method using the current land use based on the Moreno Valley General Plan.

The results of the analysis indicate that the project flows rates will exceed 110 ft^3/s flow rate which is the capacity of the Line M2 storm drain for both the Master Drainage Plan Land Use and the Current General Plan. The peak flow rate at Node 116 are as follows:

- Flow rate at Node 116 using the General Plan and land use in the Master Drainage Plan, Q=150.1 ft^3/s
- Flow rate at Node 116 using the current General Plan and land use from Moreno Valley, Q=168.3 ft^3/s

The results indicate that the upstream contributing properties must reduce the flow rates that are contributed to the Line M2 system. Using the peak flow rate at Node 116, Q=150.1 ft^3/s, the flow rates for each project must be reduced by 26%. The reduction in flows can be performed by implementing detention basin for the project area prior to discharging into Line M2. Table 1 has been developed to show the results of the hydrology analyses and the allowable flow rate that can each project can contribute to the Line M2 storm drain. The allowable flow rates shown in Table 1 are based on peak flow rates. In order to analyze the impacts to the Line M2 storm drain the allowable flow rates were adjusted by 90% in order to account for the peak flow rates through the storm drain system associated with the time of concentration.

Using the results from the rational method, Unit Hydrographs were prepared for the commercial site and the Mission Pacific site following storm events:

- 2 year, 24 hour pre-project condition
- 2 year, 24 hour pre-project condition
- 100 year, 1 hour, 3 hour, 6 hour, and 24 hour for the post project condition.

The purpose of the unit hydrographs was to determine the size of the basins required to mitigate volume for the water quality volume, hydrological conditions of concern (2 year, 24 hour storm), and Line M2 storm drain system for the 100 year event.

Table 2 provides the overall basin volume for the project in order to mitigate the following issues associated with the project:

1. Water Quality Volume to address treatment of the constituents of concern.
2. Increased runoff for the 2 year, 24 hour storm event to address Hydrological Conditions of Concern.
3. Increased runoff in order not to impact the downstream capacity of Line M2 for the 100 year storm event.

The commercial site will require to store an approximate volume of 3.8 acre feet to offset the impacts associated with water quality and the Line M2.

In addition, to evaluating the potential storm drain systems a WSPG was performed to evaluate the Line M2 system using the flow rates provided in Table 1 and the invert shown in the profile created for Line M2. The Line M2 profile begins at the existing upstream terminus, Station 16+25, and extends towards the project site along Santiago Road. It has been concluded that a variance will be needed from DWR due to the limitation in cover over the existing 120" water line at Station 22+60 along Iris Avenue. The vertical and horizontal locations were based on as-built drawing of the existing sewer line that is located parallel with the 120" waterline.

The following can be concluded from the preliminary analyses:

1. The proposed commercial site and Mission Pacific residential site should be allowed to discharge a maximum peak flow rate of 26 ft^3/s and 34.7 ft^3/s, respectively. This is the allowable percentage based on the downstream capacity of Line M2.
2. The commercial and Mission Pacific projects will need to provide a storage volume as shown on Table 2 to offset project impacts for water quality and to maintain flows that do not exceed the capacity of Line M2.
3. The design and construction of a storm drain system is possible along Iris Avenue and Perris Avenue as long as DWR provide a variance for the storm drain system. We believe a variance is a viable option since the existing ground for Iris Avenue has been established and the centerline profile has been set.
4. To remain conservative on this preliminary analysis, all properties tributary to Line M2 were included, such as the existing Home Depot site that currently does not drain to Line M2. This study assumes runoff from the existing Home Depot site will be collected and drained vial Line M2 when the facility is extended.

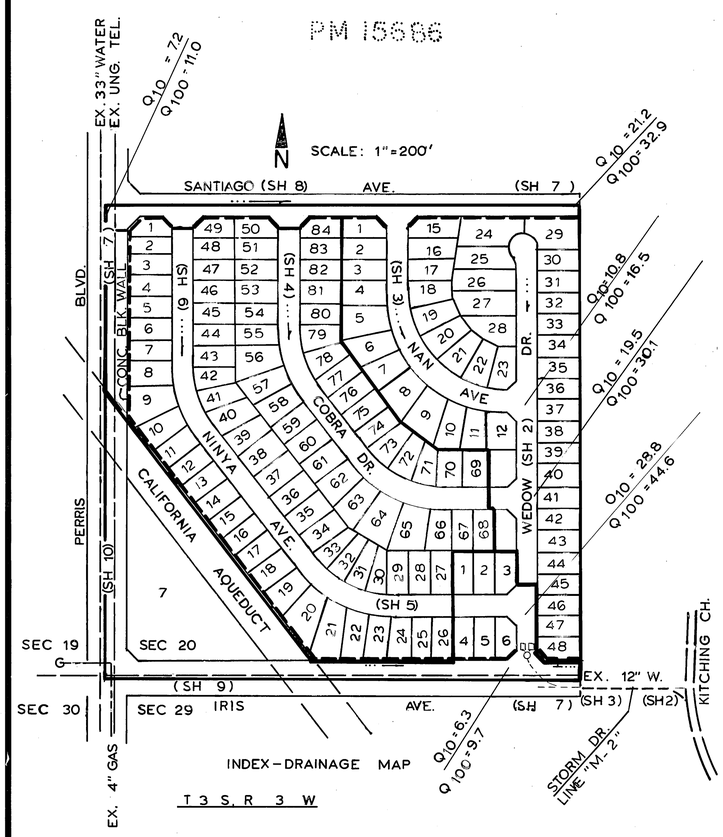
Supporting Documents

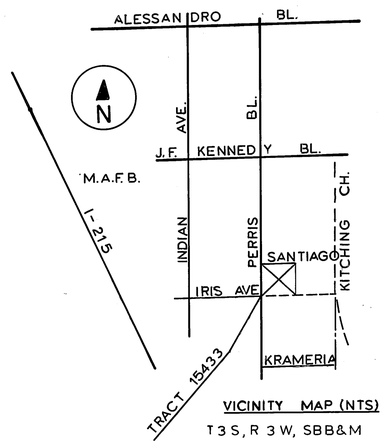
1. **RCFC & WCD Line M2 Plans**
2. **RCFC & WCD Line M2 Documentation**
3. **Table 1**
4. **Table 2**
5. **Hydrology Map**
6. **Rational Method Calculations MDP Land Use**
7. **Rational Method Calculations Current Land Use**
8. **Unit Hydrographs 2 Year, 24 Hour, Pre-Project for Mission Pacific Site**
9. **Unit Hydrographs 2 Year, 24 Hour, Post-Project for Mission Pacific Site**
10. **Unit Hydrographs 2 Year, 24 Hour, Pre-Project for Walmart Site**
11. **Unit Hydrographs 2 Year, 24 Hour, Post-Project for Walmart Site**
12. **Unit Hydrographs 100 Year, Post-Project for Mission Pacific Site**
13. **Unit Hydrographs 100 Year, Post-Project for Walmart Site**
14. **Preliminary Profile for Line M2**
15. **Preliminary WSPG for Line M2**
16. **Preliminary Basin Layout**

RCFC & WCD Line M2 Plans

JLC Engineering & Consulting, Inc.

TRACT 15433-1
STORM DRAIN PLANS
COUNTY OF RIVERSIDE





VICINITY MAP (NTS)
T3S, R3W, SBB&M

CONSTRUCTION NOTES

1. PLACE 0.21 A.C. OVER CLASS 3 A.B. WITH FOG SEAL COAT
2. PLACE 0.23' A.C. OVER CLASS 3 A.B. WITH FOG SEAL COAT
3. PLACE 0.25' A.C. OVER CLASS 3 A.B. WITH FOG SEAL COAT
4. PLACE 0.38' A.C. OVER CLASS 3 A.B. WITH FOG SEAL COAT
5. CONSTRUCT TYPE "A" CURB AND GUTTER PER RIV. CO. STD. 200
6. CONSTRUCT TYPE "B" CURB AND GUTTER PER RIV. CO. STD. 201
7. CONSTRUCT CONCRETE CROSS GUTTER PER RIV. CO. STD. 209 AND 210
8. CONSTRUCT CONCRETE SIDEWALK PER RIV. CO. STD. 400
9. CONSTRUCT HANDICAP RAMP PER RIV. CO. STD. 402
10. CONSTRUCT CONCRETE DRIVEWAYS PER RIV. CO. STD. 207, W = 16 FEET (DRIVEWAYS ARE TO BE LOCATED DURING CONSTRUCTION)
11. INSTALL BARRICADE PER RIV. CO. STD. 810
12. INSTALL TRAFFIC MARKERS, CLASS 1, TYPE "F", STATE STD. A74-A

GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND THE RELOCATION COSTS OF ALL EXISTING UTILITIES. CONTRACTOR MUST INFORM COUNTY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION, PHONE 787-2031.

2. THE DEVELOPER SHALL INSTALL STREET NAME SIGNS CONFORMING TO COUNTY STANDATD No. 816.

3. ALL WORK SHALL CONFORM TO THE REQUIREMANTS OF THE RIVERSIDE COUNTY ROAD DEPARTMENT IMPROVEMENT STANDARDS AND SPECIFICATIONS, DATED 1982, COUNTY ORDINANCE 461 AND SUBSEQUENT AMENDMENTS.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER TO INSTALL STREET CENTERLINE MONUMENTS AS REQUIRED BY THE RIVERSIDE COUNTY ORDINANCE No. 461.

5. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO APPLY TO THE RIVERSIDE COUNTY ROAD DEPARTMENT, PERMIT SECTION, FOR AN ENCROACHMENT PERMIT FOR ALL WORK ON EXISTING COUNTY MAINTAINED ROADS, OR OFFERS OF DEDICATION FOR PUBLIC USE

6. ALL UNDERGROUND FACILITIES WITH LATERALS, SHALL BE IN PLACE PRIOR TO PAVING THE STREET SECTION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, GAS, DRAINAGE.

7. CURB DEPRESSIONS AND DRIVEWAY APPROACHES WILL BE INSTALLED AND CONSTRUCTED ACCORDING TO COUNTY STANDARD No. 206 AND/OR 207, AS DIRECTED IN THE FIELD.

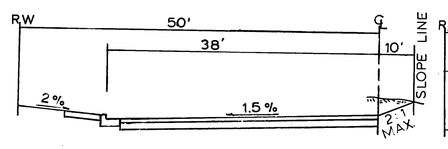
8. ALL STREET SECTIONS ARE TENTATIVE. ADDITIONAL SOIL TESTS MAY BE TAKEN AFTER COUNTY STANDARD ROUGH GRADING TO DETERMINE THE EXACT STREET SECTION REQUIREMENTS. USE COUNTY STANDARD No. 401 IF EXPANSIVE SOILS ARE ENCOUNTERED.

9. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING AND SHALL BE APPLIED AT A RATE OF 0.05 GALLONS PER SQUARE YARD. ASPHALTIC EMULSION SHALL CONFORM TO SECTIONS 37, 39, AND 94 OF THE STATE STANDARD SPECIFICATIONS.

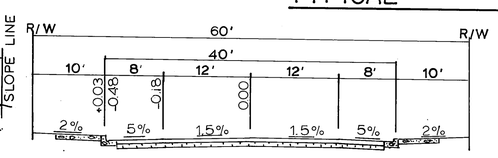
10. INSTALL STREET TREES IN ACCORDANCE WITH COUNTY ORD. No. 460.53.

11. The Contractor shall construct the flood control improvements shown on the drawings in conformance with the reqmts of the Riv. Co. Flood Control and Water Conservation District's Special Provisions and Detailed Specifications dated March 30, 1984, and Design Manual Standard Drawings dated May 1971.

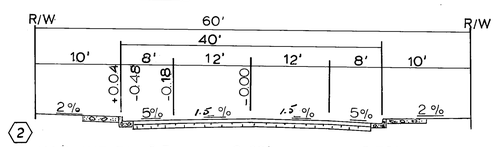
TYPICAL SECTIONS



(3) IRIS AVE. T.I. 6.0, A.C. 0.25', C.L. 3 A.B. 0.75'
8" CURB, STA. 0+00 TO STA. 13+17.80



(2) SANTIAGO AVE. T.I. 5.5, A.C. 0.23', CL. 3 A.B. 0.70', 8" CURB
STA. 0+00 TO STA. 13+17.82



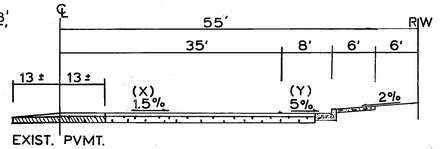
(2) NAN AVE. T.I. 5.5, A.C. 0.23', CL 3 A.B. 0.70', 8" CURB
STA. 0+00 TO STA. 7+74.51

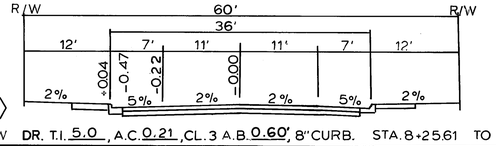
WEDOW DR. T.I. 5.5, A.C. 0.23', CL 3 A.B. 0.70', 8" CURB
STA. 0+00 TO STA. 7+35.60

NINYA AVE. T.I. 5.5, A.C. 0.23', CL. 3 A.B. 0.70', 8" CURB
STA. 0+00 TO STA. 17+66.86

COBRA DR. T.I. 5.5, A.C. 0.23', CL. 3 A.B. 0.70', 8" CURB
STA. 0+00 TO STA. 12+62.83

(4) PERRIS BLVD. T.I. 8.0, A.C. 0.38', CL. 3 A.B. 1.00', 8" CURB
STA. 0+00 TO STA. 0+72.43
STA. 0+72.43 TO STA. 4+00
(X) VAR 1.5% TO 2%
(Y) VAR 5% TO 7%
STA. 4+00 TO STA. 10+00
(X) VAR 2% TO 1%
(Y) VAR 7% TO 3.5%
STA. 10+00 TO STA. 11+00
(X) = 1%, (Y) = 3.5%
STA. 11+00 TO STA. 12+55.39
(X) VAR 1% TO 1.5%, (Y) VAR 3.5% TO 5%
STA. 12+55.39 TO STA. 13+65.39





(1) WEDOW DR. T.I. 5.0, A.C. 0.21, CL. 3 A.B. 0.60', 8" CURB. STA. 8+25.61 TO STA. 11+88.78

ESTIMATE OF QUANTITIES

1.	ROADWAY EXCAVATION	9600	C.Y.
2.	AGGREGATE BASE, CLASS 3,	8000	C.Y.
3.	ASPHALT CONCRETE	5400	TON
4.	CURB AND GUTTER, TYPE "A",	0	L.F.
5.	CURB AND GUTTER, TYPE "B",	13,421	L.F.
6.	SIDEWALK	70,436	S.F.
7.	CROSS GUTTER / SPANDRELS	2010	S.F.
8.	STREET SIGNS	9	EA.
9.	BARRICADE	1	EA.
10.	DRIVEWAY APPROACHES	138	EA.
11.	MARKERS	1	EA.
12.	STREET TREES	138	EA.
13.	18" RCP. CL. IV	61	L.F.
14.	24" RCP. CL. IV	77	L.F.
15.	45" RCP. 1000D (CIPP ALT)	8	L.F.
16.	51" RCP. 1000D (CIPP ALT)	774	L.F.
17.	54" RCP. 900D (CIPP ALT)	775	L.F.
18.	C.B. No. 1 (RCFC) W=9', V=4'	1	EA.
19.	C.B. No. 1 (RCFC) W=7', V=4'	1	EA.
20.	MH No. 1, RCFC STD. MH 251	1	EA.
21.	MH No. 2, RCFC STD. MH 252	3	EA.
22.	MH No. 4, RCFC STD. MH 254	1	EA.

MARK	REVISIONS	APPR.	DATE
	No Change R.C.R.D.	J.K.	1986

DESIGNED BY ____ DRAWN BY ____ CHECKED BY ____

AS BUILT

APPROVED BY: John Sexton
REGISTERED CIVIL ENGINEER NO. 14358 DATE: 6-2-84

APPROVED BY: Elmer F. Baumgardner
FOR ROAD COMMISSIONER RIVERSIDE COUNTY, CALIF. DATE: 9/17/84

SEXTON ASSOCIATES
1033 DRACENA CT.
REDLANDS, CA. 92373
(714) 792-4876

SCALE HOR: 1"=40' VER: 1"=4'
DATE FEB 1984

BENCH MARK: RIV. CO. BM No. M-32, INT. OF PERRIS BL. & IRIS AVE, 58.5' S.W. OF CHIS "+" IN 3" IRON COR. POST; 40.9' N.E. OF P.P. 213136; 34.4' N.W. OF TEL. POLE 15160; 1" I.P. IN HANDWELL MON. TAGGED "CO. SURVEYOR"

IN THE COUNTY OF RIVERSIDE CALIFORNIA
TRACT NO. 15433-1
LINE "M-2" SUNNYMEAD A.D.P.
IRIS AVE
STATION 0+00 TO 16+46
SCHEDULE "A"

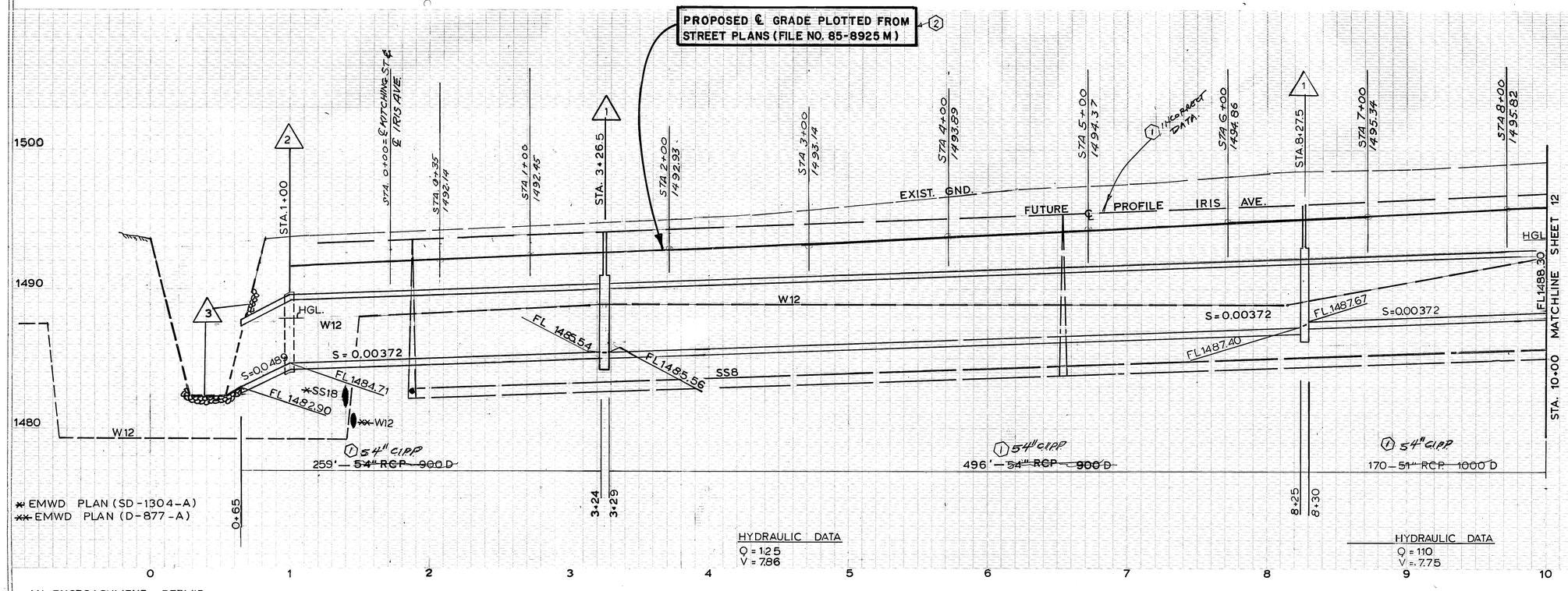
FOR MARJAN DEV. INC. 979-5775

DWG. NO. 4-385

PROJECT NO 4-0-866
1 OF 3 SHEETS

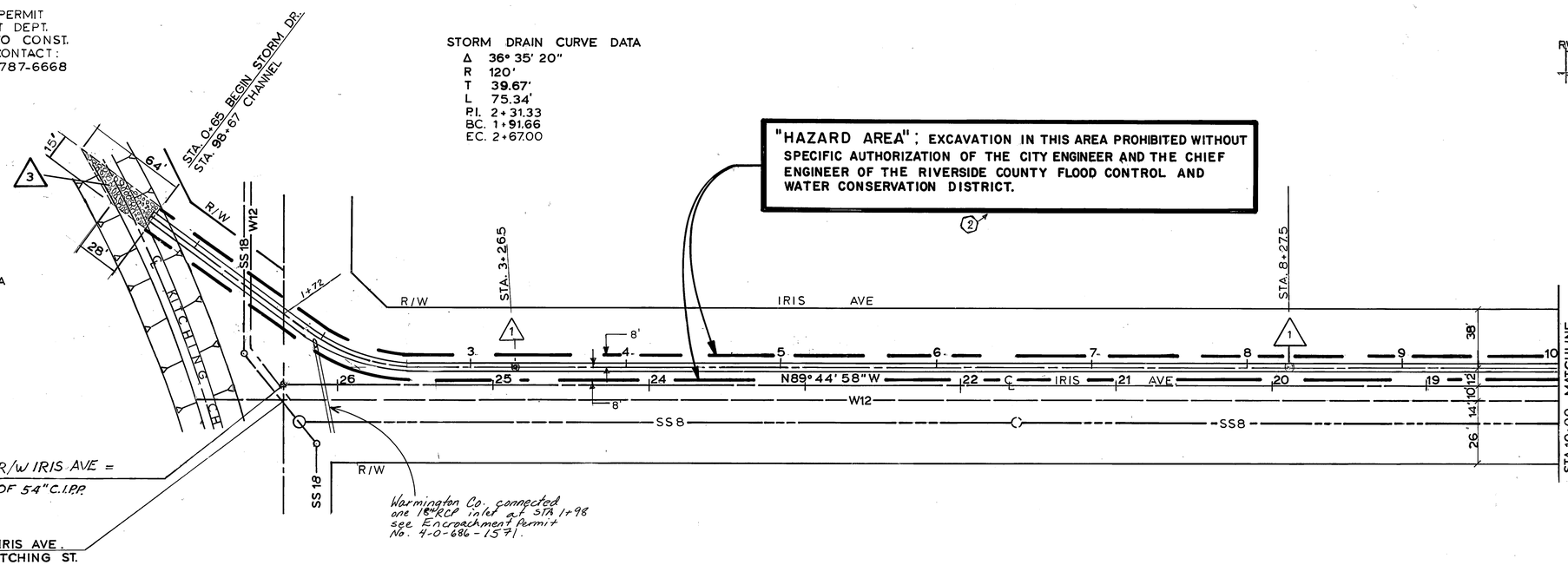
ELEV. 1503.526 Date: 1963

4-0-686



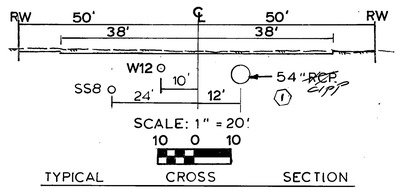
AN ENCROACHMENT PERMIT FROM RCFC PERMIT DEPT. IS REQUIRED PRIOR TO CONST. IN THE CHANNEL. CONTACT: HOWARD DICKERSON 787-6668

STORM DRAIN CURVE DATA
Δ 36° 35' 20"
R 120'
T 39.67'
L 75.34'
P.I. 2+31.33
BC. 1+91.66
EC. 2+67.00



"HAZARD AREA"; EXCAVATION IN THIS AREA PROHIBITED WITHOUT SPECIFIC AUTHORIZATION OF THE CITY ENGINEER AND THE CHIEF ENGINEER OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT.

CHANNEL CURVE DATA
Δ 30°23' 16"
R 1000.00
T 271.58
L 530.37
BC 98+00.33
EC 103+30.73

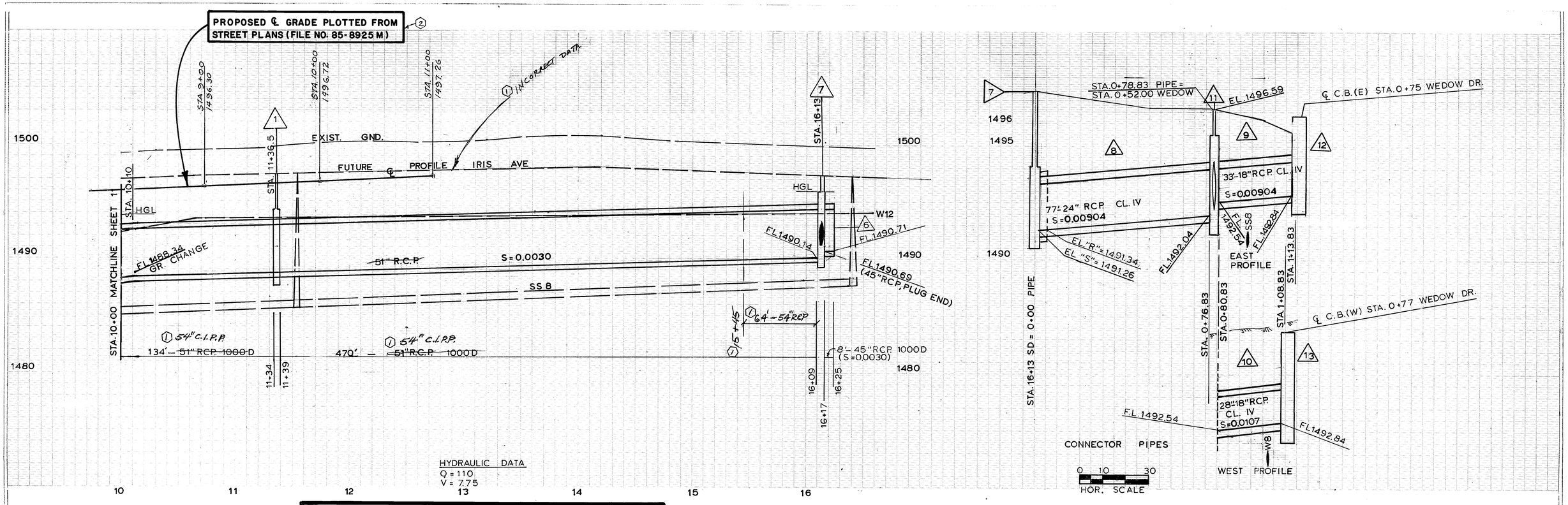


CONSTRUCTION NOTES
1. INSTALL MH. No.2 RCFC STD. MH 252
2. INSTALL CONC. PIPE COLLAR RCFC STD. M803
3. STA 0+30, INSTALL 2' THICK GROUTED 1/4 TON ROCK BLANKET

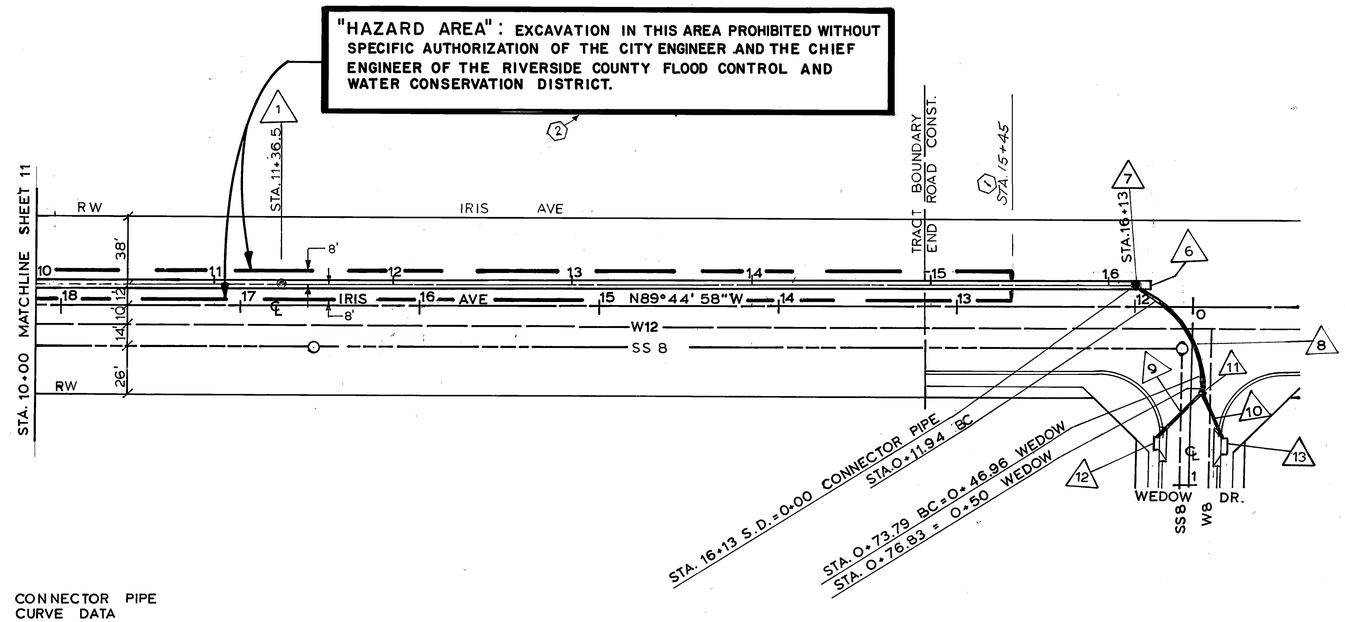
ALSO SEE 4-427

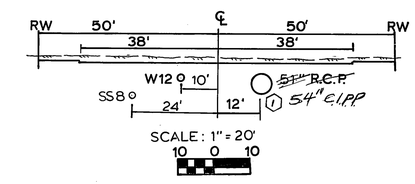
RIVERSIDE COUNTY FLOOD CONTROL and WATER CONSERVATION DISTRICT RECOMMENDED FOR APPROVAL BY: Neal L. Stillman, Design Engineer, R.E. No. 16757, DATE 7 SEPT. 84 APPROVED BY: Robert A. Nelson, Chief Engineer #17074, R.E. No. ~~12400~~, DATE 10 SEP 84	REVISIONS: 2 NOTE ADDED 5/16/88 NEAL 1 AS BUILT DATA 1/27/88 NEAL No Change R.C.F.C.D. Chief Insp. J.K. 1986	APPROVED BY: Sexton Sexton, REGISTERED CIVIL ENGINEER NO. 14358, DATE 6-2-84 APPROVED BY: Elmer F. Baumgardt, RIVERSIDE COUNTY, CALIF. FOR ROAD COMMISSIONER, DATE: 9/18/84	SEXTON ASSOCIATES 1033 DRACENA CT. REDLANDS, CA. 92373 (714) 792-4876 SCALE: HOR: 1" = 40' VER: 1" = 4' DATE	BENCH MARK: SEE SHEET 1	RIVERSIDE COUNTY FLOOD CONTROL and WATER CONSERVATION DISTRICT LINE "M-2" SUNNYMEAD A.D.P. IRIS AVE STATION 0+00 TO 10+00 TRACT NO. 15433-1	Project No. 866 4-0-~~100~~ Drawing No. 4-385 Sheet 2 of 3

AS BUILT



"HAZARD AREA": EXCAVATION IN THIS AREA PROHIBITED WITHOUT SPECIFIC AUTHORIZATION OF THE CITY ENGINEER AND THE CHIEF ENGINEER OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT.





TYPICAL CROSS SECTION

CONNECTOR PIPE CURVE DATA
Δ 59° 03' 32"
R 60.00
L 61.85
T 33.99

N

0 50 100 200

CONSTRUCTION NOTES

1. INSTALL MH. No. 2, RCFC STD. MH252
6. CONCRETE BULKHEAD PER RCFC STD 816
7. STA. 16+13, MH No. 4, RCFC STD MH254
   A=30°, B=24", C=8.6', D_1=48", D_2=45", L=8.1'
   EL. "R"=1491.34, EL. "S"=1491.26
8. 77' OF 24" RCP, CLASS IV
9. 33' OF 18" RCP, CLASS IV
10. 28' OF 18" RCP, CLASS IV
11. STA. 0+52 WEDOW, MH No. 1, RCFC STD. MH251
12. STA. 0+75 WEDOW, CB No. 1, W=7'-0", V=4'-0",
13. STA. 0+77 WEDOW, CB No. 1, W=9'-0", V=4'-0"

RIVERSIDE COUNTY FLOOD CONTROL and WATER CONSERVATION DISTRICT

REGOMMENDED FOR APPROVAL BY: Neal A. Smithson
Design Engineer
R.E. 16751
DATE 7 Sept 84

APPROVED BY: Robert A. Nelson
Acting
Chief Engineer
R.E. ~~12400~~ 21074
DATE

REVISIONS:
2 NOTE ADDED 5/16/88 NEAL
1 AS BUILT DATA 1/22/85 NEAL
No Change R.C.R.D. Chief Insp. J.K. 1986

AS BUILT

APPROVED BY: John Sexton
REGISTERED CIVIL ENGINEER NO. 14358
DATE: 6-2-84

APPROVED BY: Thomas F. Baumgardner
RIVERSIDE COUNTY, CALIF. FOR ROAD COMMISSIONER
DATE: 9/18/84

SEXTON ASSOCIATES
1933 DRACENA CT.
REDLANDS, CA. 92373
(714) 792-4876

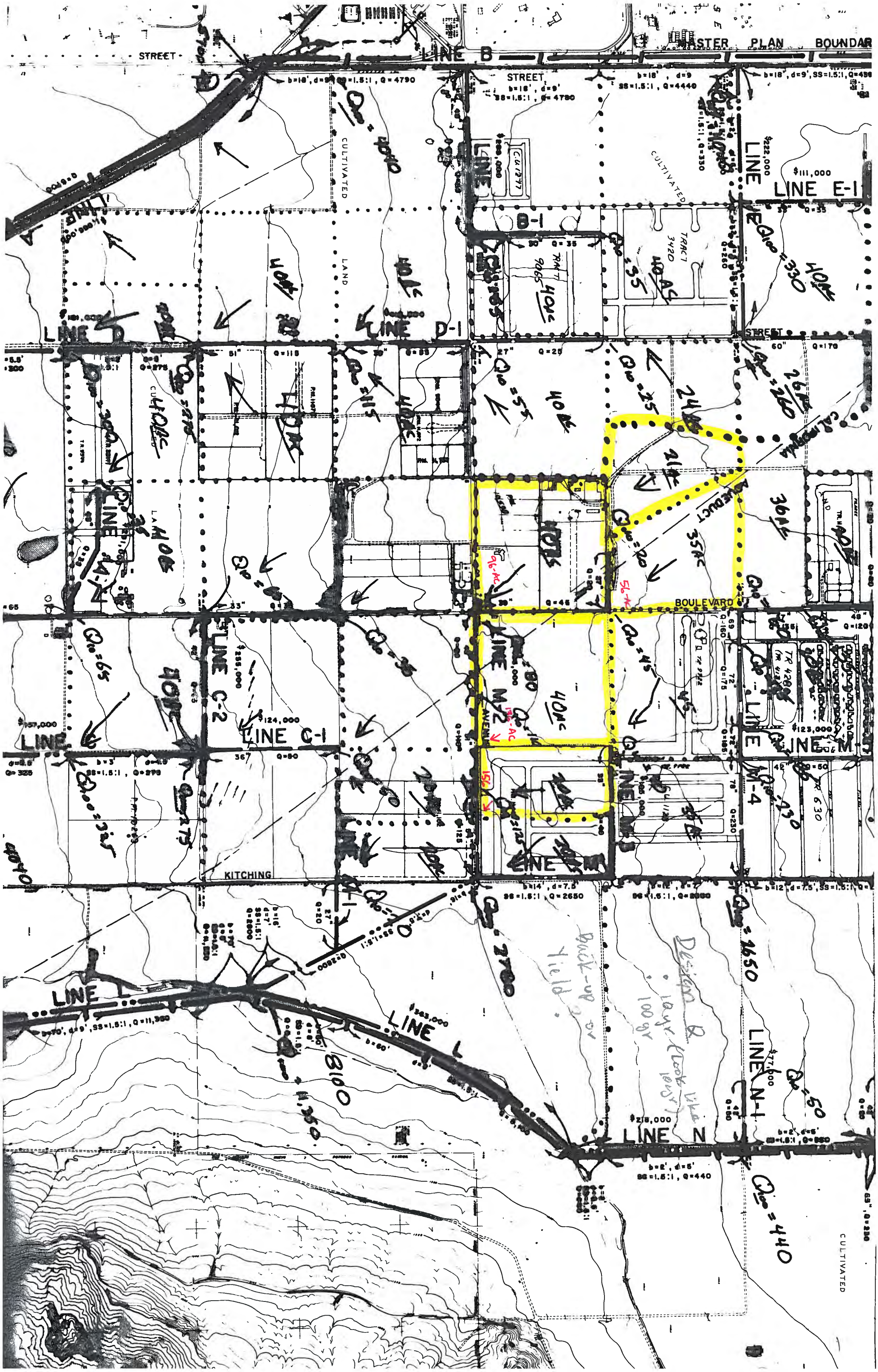
SCALE: HOR: 1" = 40' VER: 1" = 4'
DATE

BENCH MARK: SEE SHEET 1

RIVERSIDE COUNTY FLOOD CONTROL and WATER CONSERVATION DISTRICT
LINE "M-2" SUNNYMEAD A.D.P.
IRIS AVE
STATION 10+00 TO 16+46
TRACT NO. 15433-1

Project No. ~~666~~ 4-0-~~100~~
Drawing No. 4-385
Sheet 3 of 3

RCFC & WCD Line M2 Documentation


MASTER PLAN BOUNDAR
LINE B
STREET
CULTIVATED
LAND
LINE E-1
LINE D-1
LINE C-1
LINE C-2
LINE M-2
LINE M-4
LINE N-1
LINE N
LINE L
BOULEVARD
KITCHING
AQUEDUCT
CALIFORNIA
Design Q
100 yr
Back-up or
Yield

EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 3400-L23 DIETZGEN GRAPH PAPER
LOGARITHMIC
2 CYCLES X 3 CYCLES

YIELD CURVES

SUNNYMEAD M.P.
FREDRICK AREA

NOTE:
CURVES ARE FOR 10 YR FREQUENCY STORMS
FOR 100 YR. VALUES INCREASE
YC-1 BY 55%
YC-3 BY 60%
YC-7 BY 55%

Q (CFS)

150
100
10

1 10 50 100

YC-7

FREDRICK AREA YC-3

FREDRICK AREA YC-1

	SOIL	ABSOLUTE	SLOPE
YC-1 →	C	SF	1%
YC-3 →	C	CI	1%
YC-2 →	C	SF	4%

YC-2 IS ESSENTIALLY = YC-3

DUSTY 7-11-78

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT SUNNYMEAD (FREDRICK) YC-1

Calculated by [illegible] DATE 7-11-78

FREQUENCY 100 yr

Checked by ---------- DATE ---

DRAINAGE AREA	Soil & Development	A Acres	I In/hr	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS RATIO TO 10YR
I	SF-C	10	2.15	.80	17.2				H=9	1250	18.4	18.4	$\frac{17.2}{11.4}$ = 1.51 10 AC
						17.2	.003	40' ST	1.95	660	5.6		
II	" "	10	1.90	.79	15.0							24.0	$\frac{32.2}{21}$ = 1.53 20 AC
						32.2	.010	27" RCP	7.8	660	1.4		
III	" "	20	1.85	.79	29.2							25.4	$\frac{61.4}{39}$ = 1.57 40 AC
						61.4	.003	45" pipe	5.4	1320	4.1		
IV	" "	40	1.70	.78	53							29.5	$\frac{114}{72}$ = 1.58 80 AC
						114	.010	45" pipe	10.5	1320	2.1		
V	" "	80	1.65	.78	103							31.6	$\frac{217}{136}$ = 1.59 160 AC
						217							

PLATE D-2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT SUNNYMEAD (FREDRICKS) SQUARE

Calculated by [illegible] DATE 7-10-78

FREQUENCY 10 yr

Checked by ---------- DATE ---

	DRAINAGE AREA	Soil & Development	A Acres	I in/hr	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
10	I	SF-C	10	1.48	.77	11.4				H=4	1250	18.4		
							11.4	.003	40' ST.	1.8	660	6.1	18.4	
20	II	" "	10	1.27	.75	9.5								
							21	.010	40' ST	3.3	660	3.3	24.5	
40	III	" "	20	1.20	.75	18.0								
							39	.003	36" PIPE	5.4	1320	4.1	27.8	
80	IV	" "	40	1.13	.74	33.4								
							72	.010	36" PIPE	10.0	1320	2.2	32	
160	V	" "	80	1.06	.74	64								
							136						34.2	

PLATE D-2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT Sunnymead (Fredrick) VC-2 (Square)

Calculated by [illegible] 7-11-78 DATE

FREQUENCY 10 Yr

Checked by ---------- DATE

DRAINAGE AREA	Soil & Development	A Acres	I In/hr	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
I	SF-C	10	1.70	.78	13.3				H=37	1250	13.7	13.7	
						13.3	.020	40' ST.	4.4	660	2.5		
II	" "	10	1.58	.77	12.2							16.2	
						25.5	.035	40' ST.	5.9	660	1.9		
III	" "	20	1.50	.77	23.1							18.1	
						48.6	.020	40' ST	5.1	1320	4.3		
IV	" "	40	1.40	.76	43							22.4	
						92	.035	33" PIPE	15.5	1320	1.4		
V	" "	80	1.30	.75	78							23.8	
						170							

PLATE D-2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT Sunnymeadows (Freedrick) square

Calculated by [illegible] 7-10-78 DATE

FREQUENCY 10 yr.

Checked by ---------- DATE

	DRAINAGE AREA	Soil & Development	A Acres	I in/hr	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
10	I	CI C	10	1.7	.88	15				H=9	1250	14	14	90% impervious
20	II	" "	10	1.42	.88	12.5	15	.003	40' ST.	1.9	660	5.8	19.8	
40	III	" "	20	1.32	.87	23	27.5	.010	40' ST	3.4	660	3.2	23.0	
80	IV	" "	40	1.21	.87	42.1	50.5	.003	42" pipe	5.2	1320	4.2	27.2	
160	V	" "	80	1.16	.87	81	92.5	.010	42" pipe	9.6	1320	2.3	29.5	
							173							

PLATE D-2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT SUNNYMEAD (FREDRICK) YC-3

Calculated by [illegible] DATE 7-11-78

FREQUENCY 100 YR

Checked by ---------- DATE ---

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS Ratio to 10 YR
10 I	CI-C	10	2.5	.89	22.3				H=9	1250	14	14	$\frac{22.3}{15} = 1.49$
20 II	" - "	10	2.3	.89	20.5	22.3	.003	30" pipe	4.4	660	2.5	16.5	$\frac{42.8}{27.5} = 1.56$
40 III	" - "	20	2.2	.89	39.2	42.8	.010	30" pipe	8.6	660	1.3	17.8	$\frac{82}{50.5} = 1.62$
80 IV	" - "	40	2.02	.88	71	82	.003	48" pipe	6.5	1320	3.4	21.2	$\frac{153}{92.5} = 1.65$
160 V	" - "	80	1.94	.88	137	153	.010	51" pipe	11.0	1320	2.0	23.2	$\frac{290}{173} = 1.68$
						290							

PLATE D-2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT SUNNYMEAD CHANNEL AREA K-7

Calculated by [illegible] DATE 7-24-78

FREQUENCY 100yr

Checked by ---------- DATE ---

	DRAINAGE AREA	Soil & Development	A Acres	I in/hr.	C	AQ CFS	Σ Q CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	Σ T	REMARKS
10	I	SF-B	10	1.50	.71	10.7				H=9	1250	18	18	
20	II	SF-B	10	1.27	.69	8.8	10.7	.003	40' ST.	1.8	660	6.1	24.1	
40	III	SF-B	20	1.20	.69	16.6	19.5	.010	40' ST.	3.2	660	3.4	27.5	
80	IV	SF-B	40	1.12	.68	30.5	36.1	.003	36" pipe	5.0	1320	4.4	31.9	
160	V	SF-B	80	1.07	.68	58.2	66.6	.010	36" pipe	9.3	1320	2.4	34.3	
							125							

PLATE D-2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT Sunnymead M.P. YC-7

Calculated by Dusty DATE 7-24-78

FREQUENCY 100 yr.

Checked by ---------- DATE ----

	DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS	
10	I	SF-B	10	2.2	.75	16.5				1.9	1250	18	18	$\frac{16.5}{10.7} = 1.54$	10A
20	II	SF-B	10	1.9	.74	14.1	16.5	.003	40' ST.	1.9	660	5.8	23.8	$\frac{30.6}{19.5} = 1.57$	20A
40	III	" "	20	1.8	.73	26.3	30.6	.010	40' ST.	3.5	660	3.1	26.9	$\frac{56.9}{36.1} = 1.58$	40A
80	IV	" "	40	1.68	.72	48.4	56.9	.003	42" pipe	5.8	1320	3.8	30.7	$\frac{105}{66.6} = 1.58$	80A
160	V	" "	80	1.62	.72	93.3	105	.010	42" pipe	11	1320	2.0	32.7	$\frac{198}{125} = 1.58$	160A
							198								

PLATE D-2

Table 1

MASTER DRAINAGE PLAN LINE M2
HYDROLOGY AND FLOW CONTRIBUTION ANALYSIS
TABLE 1

	NODE	NODE	WATERSHED DESIGNATION	MDP Q	MDP LAND USE	FLOW RATES BASED ON CURRENT LAND USE	CURRENT GENERAL PLAN LAND USE	ALLOWABLE FLOW RATE	PERCENTAGE OF TOTAL FLOW RATE	ADJUSTED ALLOWABLE FLOW RATE
MISSION PACIFIC	101	103	A1 - A2	22.6	R-5	22.6	R-5	16.7	8.9%	15.1
MISSION PACIFIC	104	106	A3 - A4	24.3	R-5	28.6	R-30	18.0	9.5%	16.2
WALLMART	107	109	A5 - A6	35.2	R-5	46.2	COMMERCIAL	26.0	13.8%	23.4
APN 485-220-015 TO -019	110	112	A7 - A8	23	R-5	29.9	COMMERCIAL	17.0	9.0%	15.3
HOME DEPOT	113	116	A9, A12 - A13	29.5	COMMERCIAL	29.5	COMMERCIAL	21.8	11.6%	19.6
APN 485-220-006 TO -009	117	119	A10 - A12	32.1	COMMERCIAL	32.1	COMMERCIAL	23.8	12.6%	21.4
TOTAL PEAK FLOW RATE AT NODE 116				166.7		188.9		123.4		
TOTAL ADJUSTED FLOW RATE AT NODE 116				150.1		168.3		111.0		

LINE M2 STORM DRAIN CAPACITY	**110**
MAXIMUM PEAK FLOW RATE	**150.1**
REQUIRED FLOW RATE REDUCTION	**40.1**
PERCENT FLOW RATE ALLOWABLE FROM SITE	**74%**

Table 2

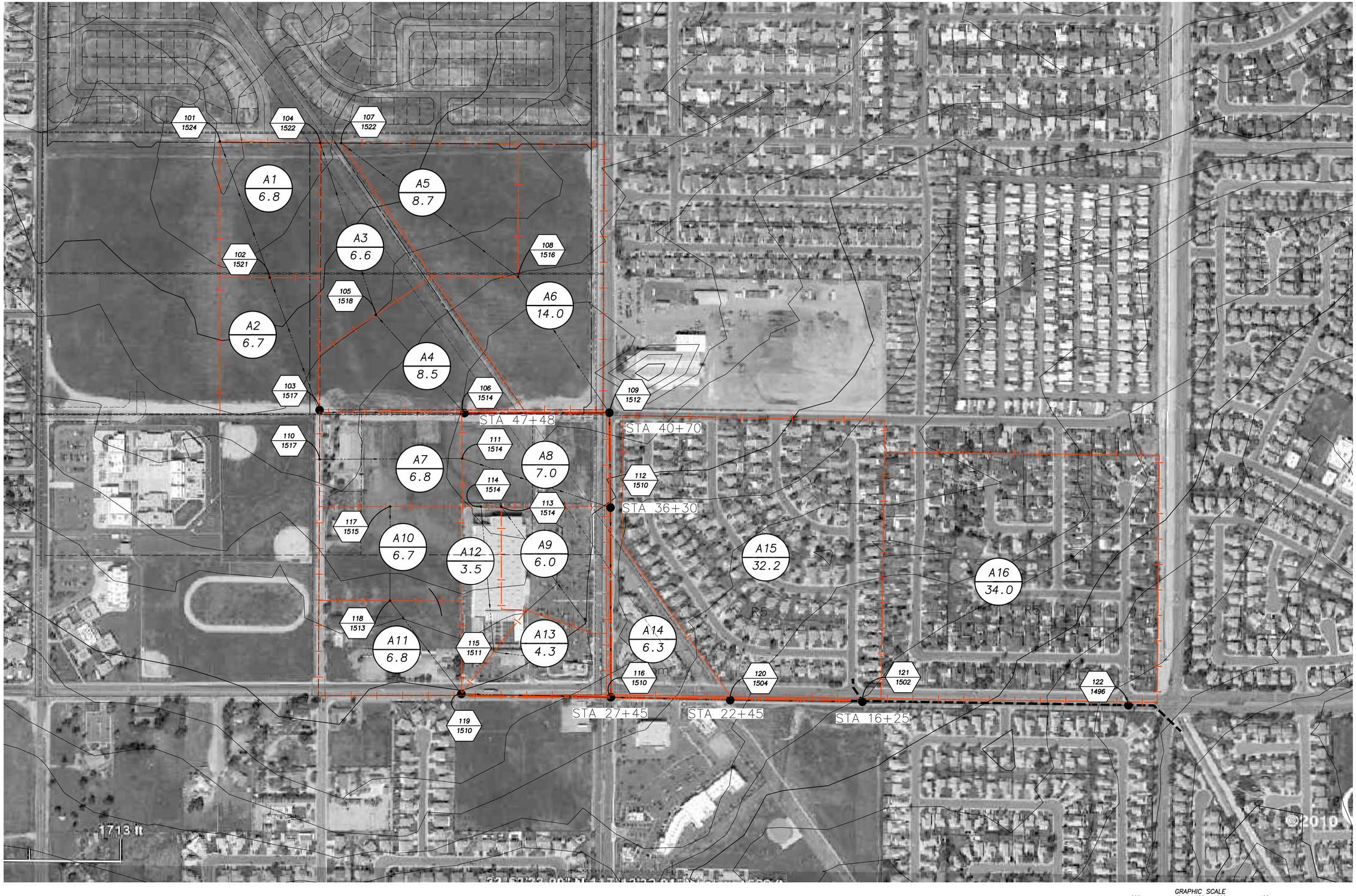
Line M2 Storm Drain Analysis

Maximum Peak Flow Rate for Line M2 @ Connection 118.5 ft^3/s

Table 2 - Required Basin Sizing

Development	Total Area (ac)	Maximum Allowable Peak Flow (ft^3/s)	WQ Volume	2 Yr, 24 Hr Volume	100 Yr, 1 Hr Volume	Total Basin Volume
Mission Pacific	27.2	34.7	1	1.9	1.1	4
Walmart	21.7	26	1	1.6	1.2	3.8
						7.8

Hydrology Map


101
1524
104
1522
107
1522
A1
6.8
A5
8.7
A3
6.6
102
1521
108
1516
105
1518
A6
14.0
A2
6.7
A4
8.5
103
1517
106
1514
109
1512
STA 47+48
STA 40+70
110
1517
111
1514
A7
6.8
A8
7.0
114
1514
112
1510
113
1514
STA 36+30
117
1515
A10
6.7
A12
3.5
A9
6.0
A15
32.2
A16
34.0
R5
R5
118
1513
A11
6.8
115
1511
A13
4.3
A14
6.3
116
1510
120
1504
121
1502
122
1496
STA 27+45
STA 22+45
STA 16+25
119
1510
1713 ft
©2010
GRAPHIC SCALE
200 0 100 200 400
1" = 200'

Rational Method Calculations MDP Land Use

```
                Riverside County Rational Hydrology Program

     CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
           Rational Hydrology Study        Date: 11/09/12
File:1730312POSTMDP.out
     ----------------------------------------------------------------------
     LINE M2 STORM DRAIN ANALYSIS
     LAND USE BASED ON MDP


     ----------------------------------------------------------------------
      *********   Hydrology Study Control Information **********

      English (in-lb) Units used in input data file

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


     Program License Serial Number 6269

     ----------------------------------------------------------------------
     Rational Method Hydrology Program based on
     Riverside County Flood Control & Water Conservation District
     1978 hydrology manual

     Storm event (year) =  100.00 Antecedent Moisture Condition = 2

     Standard intensity-duration curves data (Plate D-4.1)
     For the [ Sunnymead-Moreno ] area used.
     10 year storm 10 minute intensity =  2.010(In/Hr)
     10 year storm 60 minute intensity =  0.820(In/Hr)
     100 year storm 10 minute intensity =  2.940(In/Hr)
     100 year storm 60 minute intensity =  1.200(In/Hr)

     Storm event year = 100.0
     Calculated rainfall intensity data:
     1 hour intensity =  1.200(In/Hr)
     Slope of intensity duration curve = 0.5000




     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station      101.000 to Point/Station      102.000
     **** INITIAL AREA EVALUATION ****
     ______________________________________________________________________
     Initial area flow distance =   677.000(Ft.)
     Top (of initial area) elevation =  1524.000(Ft.)
     Bottom (of initial area) elevation =  1521.000(Ft.)
     Difference in elevation =     3.000(Ft.)
     Slope =    0.00443  s(percent)=       0.44
     TC = k(0.390)*[(length^3)/(elevation change)]^0.2
     Initial area time of concentration =   15.631 min.
     Rainfall intensity =      2.351(In/Hr) for a   100.0 year storm
```



```
     SINGLE FAMILY (1/4 Acre Lot)
     Runoff Coefficient = 0.761
     Decimal fraction soil group A = 0.000
     Decimal fraction soil group B = 1.000
     Decimal fraction soil group C = 0.000
     Decimal fraction soil group D = 0.000
     RI index for soil(AMC 2)  =  56.00
     Pervious area fraction =  0.500; Impervious fraction =  0.500
     Initial subarea runoff =     12.171(CFS)
     Total initial stream area =        6.800(Ac.)
     Pervious area fraction = 0.500


     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station      102.000 to Point/Station      103.000
     **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
     ______________________________________________________________________
     Top of street segment elevation =  1521.000(Ft.)
     End of street segment elevation =  1517.000(Ft.)
     Length of street segment  =   670.000(Ft.)
     Height of curb above gutter flowline  =    6.0(In.)
     Width of half street (curb to crown)  =  22.000(Ft.)
     Distance from crown to crossfall grade break  =  18.000(Ft.)
     Slope from gutter to grade break (v/hz) =   0.020
     Slope from grade break to crown (v/hz)  =   0.020
     Street flow is on [2] side(s) of the street
     Distance from curb to property line  =  10.000(Ft.)
     Slope from curb to property line (v/hz) =   0.025
     Gutter width =   2.000(Ft.)
     Gutter hike from flowline =  2.000(In.)
      Manning's N in gutter =  0.0150
      Manning's N from gutter to grade break =  0.0150
      Manning's N from grade break to crown =  0.0150
     Estimated mean flow rate at midpoint of street =     17.421(CFS)
     Depth of flow =   0.494(Ft.), Average velocity =   2.489(Ft/s)
     Streetflow hydraulics at midpoint of street travel:
     Halfstreet flow width =  18.365(Ft.)
     Flow velocity =   2.49(Ft/s)
     Travel time =    4.49 min.     TC =   20.12  min.
      Adding area flow to street
     SINGLE FAMILY (1/4 Acre Lot)
     Runoff Coefficient = 0.749
     Decimal fraction soil group A = 0.000
     Decimal fraction soil group B = 1.000
     Decimal fraction soil group C = 0.000
     Decimal fraction soil group D = 0.000
     RI index for soil(AMC 2)  =  56.00
     Pervious area fraction =  0.500; Impervious fraction =  0.500
     Rainfall intensity =      2.072(In/Hr) for a   100.0 year storm
     Subarea runoff =     10.399(CFS) for      6.700(Ac.)
     Total runoff =     22.569(CFS)    Total area =      13.500(Ac.)
     Street flow at end of street =     22.569(CFS)
     Half street flow at end of street =     11.285(CFS)
     Depth of flow =   0.539(Ft.), Average velocity =   2.567(Ft/s)
     Warning: depth of flow exceeds top of curb
     Distance that curb overflow reaches into property =    1.54(Ft.)
```

```
Flow width (from curb towards crown)=  20.592(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1512.000(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =   678.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.569(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    22.569(CFS)
Normal flow depth in pipe =   20.81(In.)
Flow top width inside pipe =   27.66(In.)
Critical Depth =   19.38(In.)
Pipe flow velocity =      6.21(Ft/s)
Travel time through pipe =    1.82 min.
Time of concentration (TC) =    21.94 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.500(Ac.)
Runoff from this stream =     22.569(CFS)
Time of concentration =   21.94 min.
Rainfall intensity =     1.985(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   844.000(Ft.)
Top (of initial area) elevation =  1522.000(Ft.)
Bottom (of initial area) elevation =  1518.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00474  s(percent)=       0.47
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.844 min.
Rainfall intensity =      2.265(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.758
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     11.325(CFS)
Total initial stream area =        6.600(Ac.)
Pervious area fraction = 0.500
```



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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1518.000(Ft.)
End of street segment elevation =  1514.000(Ft.)
Length of street segment  =   618.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     17.845(CFS)
Depth of flow =   0.492(Ft.), Average velocity =   2.582(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.247(Ft.)
Flow velocity =   2.58(Ft/s)
Travel time =    3.99 min.     TC =   20.83  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.747
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.036(In/Hr) for a   100.0 year storm
Subarea runoff =     12.933(CFS) for      8.500(Ac.)
Total runoff =     24.258(CFS)    Total area =      15.100(Ac.)
Street flow at end of street =     24.258(CFS)
Half street flow at end of street =     12.129(CFS)
Depth of flow =   0.544(Ft.), Average velocity =   2.683(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    1.76(Ft.)
Flow width (from curb towards crown)=  20.868(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     15.100(Ac.)
Runoff from this stream =     24.258(CFS)
Time of concentration =   20.83 min.
Rainfall intensity =     2.036(In/Hr)
```

```
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       22.569     21.94                 1.985
2       24.258     20.83                 2.036
Largest stream flow has longer or shorter time of concentration
Qp =     24.258 + sum of
        Qa          Tb/Ta
        22.569 *    0.950 =     21.436
Qp =     45.694

Total of 2 streams to confluence:
Flow rates before confluence point:
      22.569      24.258
Area of streams before confluence:
       13.500       15.100
Results of confluence:
Total flow rate =     45.694(CFS)
Time of concentration =    20.834 min.
Effective stream area after confluence =     28.600(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1509.000(Ft.)
Downstream point/station elevation =  1507.000(Ft.)
Pipe length  =   675.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    45.694(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    45.694(CFS)
Normal flow depth in pipe =   32.63(In.)
Flow top width inside pipe =   28.84(In.)
Critical Depth =   25.87(In.)
Pipe flow velocity =      6.17(Ft/s)
Travel time through pipe =    1.82 min.
Time of concentration (TC) =    22.66 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.600(Ac.)
Runoff from this stream =     45.694(CFS)
Time of concentration =   22.66 min.
Rainfall intensity =     1.953(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      108.000
```



```
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1522.000(Ft.)
Bottom (of initial area) elevation =  1516.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00600  s(percent)=       0.60
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   17.196 min.
Rainfall intensity =      2.242(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.757
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     14.756(CFS)
Total initial stream area =        8.700(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1516.000(Ft.)
End of street segment elevation =  1512.000(Ft.)
Length of street segment  =   765.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     25.038(CFS)
Depth of flow =   0.568(Ft.), Average velocity =   2.463(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    2.71(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.000(Ft.)
Flow velocity =   2.46(Ft/s)
Travel time =    5.18 min.     TC =   22.37  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.744
Decimal fraction soil group A = 0.000
```

```
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.965(In/Hr) for a   100.0 year storm
Subarea runoff =     20.455(CFS) for     14.000(Ac.)
Total runoff =     35.211(CFS)    Total area =      22.700(Ac.)
Street flow at end of street =     35.211(CFS)
Half street flow at end of street =     17.606(CFS)
Depth of flow =   0.621(Ft.), Average velocity =   2.733(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    4.82(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     22.700(Ac.)
Runoff from this stream =     35.211(CFS)
Time of concentration =   22.37 min.
Rainfall intensity =     1.965(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       45.694     22.66                 1.953
2       35.211     22.37                 1.965
Largest stream flow has longer time of concentration
Qp =     45.694 + sum of
        Qb         Ia/Ib
        35.211 *    0.994 =     34.990
Qp =     80.684

Total of 2 streams to confluence:
Flow rates before confluence point:
      45.694      35.211
Area of streams before confluence:
       28.600       22.700
Results of confluence:
Total flow rate =     80.684(CFS)
Time of concentration =    22.657 min.
Effective stream area after confluence =     51.300(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1507.000(Ft.)
```



```
Downstream point/station elevation =  1505.000(Ft.)
Pipe length  =   444.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    80.684(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    80.684(CFS)
Normal flow depth in pipe =   36.66(In.)
Flow top width inside pipe =   34.98(In.)
Critical Depth =   33.22(In.)
Pipe flow velocity =      8.38(Ft/s)
Travel time through pipe =    0.88 min.
Time of concentration (TC) =    23.54 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     51.300(Ac.)
Runoff from this stream =     80.684(CFS)
Time of concentration =   23.54 min.
Rainfall intensity =     1.916(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   665.000(Ft.)
Top (of initial area) elevation =  1517.000(Ft.)
Bottom (of initial area) elevation =  1514.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00451  s(percent)=       0.45
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.464 min.
Rainfall intensity =      2.364(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.762
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     12.245(CFS)
Total initial stream area =        6.800(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      111.000 to Point/Station      112.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1514.000(Ft.)
End of street segment elevation =  1510.000(Ft.)
Length of street segment  =   730.000(Ft.)
```

```
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     17.676(CFS)
Depth of flow =   0.503(Ft.), Average velocity =   2.411(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    0.11(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.810(Ft.)
Flow velocity =   2.41(Ft/s)
Travel time =    5.05 min.     TC =   20.51  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.748
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.052(In/Hr) for a   100.0 year storm
Subarea runoff =     10.746(CFS) for      7.000(Ac.)
Total runoff =     22.990(CFS)    Total area =      13.800(Ac.)
Street flow at end of street =     22.990(CFS)
Half street flow at end of street =     11.495(CFS)
Depth of flow =   0.549(Ft.), Average velocity =   2.479(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    1.97(Ft.)
Flow width (from curb towards crown)=  21.126(Ft.)


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Process from Point/Station      111.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     13.800(Ac.)
Runoff from this stream =     22.990(CFS)
Time of concentration =   20.51 min.
Rainfall intensity =     2.052(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)
```



```
1       80.684     23.54                 1.916
2       22.990     20.51                 2.052
Largest stream flow has longer time of concentration
Qp =     80.684 + sum of
        Qb         Ia/Ib
        22.990 *    0.933 =     21.459
Qp =    102.143

Total of 2 streams to confluence:
Flow rates before confluence point:
      80.684      22.990
Area of streams before confluence:
       51.300       13.800
Results of confluence:
Total flow rate =    102.143(CFS)
Time of concentration =    23.541 min.
Effective stream area after confluence =     65.100(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      112.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1505.000(Ft.)
Downstream point/station elevation =  1503.000(Ft.)
Pipe length  =   885.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   102.143(CFS)
Nearest computed pipe diameter  =     57.00(In.)
Calculated individual pipe flow  =   102.143(CFS)
Normal flow depth in pipe =   44.16(In.)
Flow top width inside pipe =   47.63(In.)
Critical Depth =   35.05(In.)
Pipe flow velocity =      6.93(Ft/s)
Travel time through pipe =    2.13 min.
Time of concentration (TC) =    25.67 min.


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Process from Point/Station      112.000 to Point/Station      116.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     65.100(Ac.)
Runoff from this stream =    102.143(CFS)
Time of concentration =   25.67 min.
Rainfall intensity =     1.835(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      113.000 to Point/Station      116.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   870.000(Ft.)
Top (of initial area) elevation =  1514.000(Ft.)
```

```
Bottom (of initial area) elevation =  1510.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00460  s(percent)=       0.46
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.195 min.
Rainfall intensity =      2.559(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     13.416(CFS)
Total initial stream area =        6.000(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      113.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      6.000(Ac.)
Runoff from this stream =     13.416(CFS)
Time of concentration =   13.20 min.
Rainfall intensity =     2.559(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   682.000(Ft.)
Top (of initial area) elevation =  1514.000(Ft.)
Bottom (of initial area) elevation =  1511.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00440  s(percent)=       0.44
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.077 min.
Rainfall intensity =      2.675(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      8.188(CFS)
Total initial stream area =        3.500(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      115.000 to Point/Station      116.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1511.000(Ft.)
End of street segment elevation =  1508.000(Ft.)
Length of street segment  =   465.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     12.713(CFS)
Depth of flow =   0.446(Ft.), Average velocity =   2.374(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  15.971(Ft.)
Flow velocity =   2.37(Ft/s)
Travel time =    3.26 min.     TC =   15.34  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.373(In/Hr) for a   100.0 year storm
Subarea runoff =      8.903(CFS) for      4.300(Ac.)
Total runoff =     17.091(CFS)    Total area =       7.800(Ac.)
Street flow at end of street =     17.091(CFS)
Half street flow at end of street =      8.545(CFS)
Depth of flow =   0.486(Ft.), Average velocity =   2.551(Ft/s)
Flow width (from curb towards crown)=  17.952(Ft.)


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Process from Point/Station      115.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      7.800(Ac.)
Runoff from this stream =     17.091(CFS)
Time of concentration =   15.34 min.
Rainfall intensity =     2.373(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)
```

```
1       13.416     13.20                 2.559
2       17.091     15.34                 2.373
Largest stream flow has longer time of concentration
Qp =     17.091 + sum of
        Qb         Ia/Ib
        13.416 *    0.927 =     12.443
Qp =     29.534

Total of 2 streams to confluence:
Flow rates before confluence point:
      13.416      17.091
Area of streams before confluence:
        6.000        7.800
Results of confluence:
Total flow rate =     29.534(CFS)
Time of concentration =    15.341 min.
Effective stream area after confluence =     13.800(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      116.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     13.800(Ac.)
Runoff from this stream =     29.534(CFS)
Time of concentration =   15.34 min.
Rainfall intensity =     2.373(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1      102.143     25.67              1.835
2       29.534     15.34              2.373
Largest stream flow has longer time of concentration
Qp =    102.143 + sum of
        Qb         Ia/Ib
        29.534 *    0.773 =     22.832
Qp =    124.976

Total of 2 main streams to confluence:
Flow rates before confluence point:
     102.143      29.534
Area of streams before confluence:
       65.100       13.800


Results of confluence:
Total flow rate =    124.976(CFS)
Time of concentration =    25.669 min.
Effective stream area after confluence  =     78.900(Ac.)
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Process from Point/Station      115.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     78.900(Ac.)
Runoff from this stream =    124.976(CFS)
Time of concentration =   25.67 min.
Rainfall intensity =     1.835(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      118.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   440.000(Ft.)
Top (of initial area) elevation =  1515.000(Ft.)
Bottom (of initial area) elevation =  1513.000(Ft.)
Difference in elevation =     2.000(Ft.)
Slope =    0.00455  s(percent)=       0.45
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.069 min.
Rainfall intensity =      2.929(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     17.198(CFS)
Total initial stream area =        6.700(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      118.000 to Point/Station      119.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1513.000(Ft.)
End of street segment elevation =  1510.000(Ft.)
Length of street segment  =   550.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
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```
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     24.728(CFS)
Depth of flow =   0.562(Ft.), Average velocity =   2.499(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    2.49(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  21.778(Ft.)
Flow velocity =   2.50(Ft/s)
Travel time =    3.67 min.     TC =   13.74  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.873
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.508(In/Hr) for a   100.0 year storm
Subarea runoff =     14.896(CFS) for      6.800(Ac.)
Total runoff =     32.095(CFS)    Total area =      13.500(Ac.)
Street flow at end of street =     32.095(CFS)
Half street flow at end of street =     16.047(CFS)
Depth of flow =   0.602(Ft.), Average velocity =   2.697(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    4.08(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1505.000(Ft.)
Downstream point/station elevation =  1503.000(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.095(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    32.095(CFS)
Normal flow depth in pipe =   26.72(In.)
Flow top width inside pipe =   31.49(In.)
Critical Depth =   22.05(In.)
Pipe flow velocity =      5.71(Ft/s)
Travel time through pipe =    2.04 min.
Time of concentration (TC) =    15.78 min.


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Process from Point/Station      119.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     13.500(Ac.)
Runoff from this stream =     32.095(CFS)
```



```
Time of concentration =   15.78 min.
Rainfall intensity =     2.340(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1      124.976     25.67                  1.835
2       32.095     15.78                  2.340
Largest stream flow has longer time of concentration
Qp =    124.976 + sum of
        Qb          Ia/Ib
        32.095 *    0.784 =     25.165
Qp =    150.140

Total of 2 streams to confluence:
Flow rates before confluence point:
     124.976      32.095
Area of streams before confluence:
       78.900       13.500
Results of confluence:
Total flow rate =    150.140(CFS)
Time of concentration =    25.669 min.
Effective stream area after confluence =     92.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      116.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1503.000(Ft.)
Downstream point/station elevation =  1499.000(Ft.)
Pipe length  =   557.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   150.140(CFS)
Nearest computed pipe diameter  =     51.00(In.)
Calculated individual pipe flow  =   150.140(CFS)
Normal flow depth in pipe =   44.53(In.)
Flow top width inside pipe =   33.94(In.)
Critical Depth =   43.35(In.)
Pipe flow velocity =     11.43(Ft/s)
Travel time through pipe =    0.81 min.
Time of concentration (TC) =    26.48 min.


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Process from Point/Station      116.000 to Point/Station      120.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.867
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
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```
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    26.48 min.
Rainfall intensity =      1.806(In/Hr) for a   100.0 year storm
Subarea runoff =      9.866(CFS) for      6.300(Ac.)
Total runoff =    160.006(CFS)    Total area =      98.700(Ac.)


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Process from Point/Station      120.000 to Point/Station      121.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1499.000(Ft.)
Downstream point/station elevation =  1497.000(Ft.)
Pipe length  =   617.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   160.006(CFS)
Nearest computed pipe diameter  =     63.00(In.)
Calculated individual pipe flow  =   160.006(CFS)
Normal flow depth in pipe =   48.94(In.)
Flow top width inside pipe =   52.47(In.)
Critical Depth =   42.97(In.)
Pipe flow velocity =      8.88(Ft/s)
Travel time through pipe =    1.16 min.
Time of concentration (TC) =    27.64 min.


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Process from Point/Station      120.000 to Point/Station      121.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.733
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =    27.64 min.
Rainfall intensity =      1.768(In/Hr) for a   100.0 year storm
Subarea runoff =     41.706(CFS) for     32.200(Ac.)
Total runoff =    201.712(CFS)    Total area =     130.900(Ac.)


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Process from Point/Station      121.000 to Point/Station      122.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1497.000(Ft.)
Downstream point/station elevation =  1491.000(Ft.)
Pipe length  =  1240.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   201.712(CFS)
Nearest computed pipe diameter  =     63.00(In.)
Calculated individual pipe flow  =   201.712(CFS)
Normal flow depth in pipe =   50.44(In.)
Flow top width inside pipe =   50.34(In.)
Critical Depth =   48.23(In.)
```



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Pipe flow velocity =     10.86(Ft/s)
Travel time through pipe =    1.90 min.
Time of concentration (TC) =    29.54 min.


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Process from Point/Station      121.000 to Point/Station      122.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.729
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =    29.54 min.
Rainfall intensity =      1.710(In/Hr) for a   100.0 year storm
Subarea runoff =     42.391(CFS) for     34.000(Ac.)
Total runoff =    244.103(CFS)    Total area =     164.900(Ac.)
End of computations, total study area =          164.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.418
Area averaged RI index number =  56.0
```

Rational Method Calculations Current Land Use

```
                Riverside County Rational Hydrology Program

     CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
           Rational Hydrology Study        Date: 11/09/12
File:1710312POSTMVLU.out
     ---------------------------------------------------------------------------
     LINE M2 STORM DRAIN ANALYSIS
     LAND USE BASED ON UPDATED LAND USE CITY OF MORENO VALLEY


     ---------------------------------------------------------------------------
      *********   Hydrology Study Control Information **********

      English (in-lb) Units used in input data file

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



     Program License Serial Number 6269

     ---------------------------------------------------------------------------
     Rational Method Hydrology Program based on
     Riverside County Flood Control & Water Conservation District
     1978 hydrology manual

     Storm event (year) =  100.00 Antecedent Moisture Condition = 2

     Standard intensity-duration curves data (Plate D-4.1)
     For the [ Sunnymead-Moreno ] area used.
     10 year storm 10 minute intensity =  2.010(In/Hr)
     10 year storm 60 minute intensity =  0.820(In/Hr)
     100 year storm 10 minute intensity =  2.940(In/Hr)
     100 year storm 60 minute intensity =  1.200(In/Hr)

     Storm event year = 100.0
     Calculated rainfall intensity data:
     1 hour intensity =  1.200(In/Hr)
     Slope of intensity duration curve = 0.5000




     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station      101.000 to Point/Station      102.000
     **** INITIAL AREA EVALUATION ****
     ______________________________________________________________________
     Initial area flow distance =   677.000(Ft.)
     Top (of initial area) elevation =  1524.000(Ft.)
     Bottom (of initial area) elevation =  1521.000(Ft.)
     Difference in elevation =     3.000(Ft.)
     Slope =    0.00443  s(percent)=       0.44
     TC = k(0.390)*[(length^3)/(elevation change)]^0.2
     Initial area time of concentration =   15.631 min.
     Rainfall intensity =      2.351(In/Hr) for a   100.0 year storm
```



```
     SINGLE FAMILY (1/4 Acre Lot)
     Runoff Coefficient = 0.761
     Decimal fraction soil group A = 0.000
     Decimal fraction soil group B = 1.000
     Decimal fraction soil group C = 0.000
     Decimal fraction soil group D = 0.000
     RI index for soil(AMC 2)  =  56.00
     Pervious area fraction =  0.500; Impervious fraction =  0.500
     Initial subarea runoff =     12.171(CFS)
     Total initial stream area =        6.800(Ac.)
     Pervious area fraction = 0.500


     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station      102.000 to Point/Station      103.000
     **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
     ______________________________________________________________________
     Top of street segment elevation =  1521.000(Ft.)
     End of street segment elevation =  1517.000(Ft.)
     Length of street segment  =   670.000(Ft.)
     Height of curb above gutter flowline  =    6.0(In.)
     Width of half street (curb to crown)  =  22.000(Ft.)
     Distance from crown to crossfall grade break  =  18.000(Ft.)
     Slope from gutter to grade break (v/hz) =   0.020
     Slope from grade break to crown (v/hz)  =   0.020
     Street flow is on [2] side(s) of the street
     Distance from curb to property line  =  10.000(Ft.)
     Slope from curb to property line (v/hz) =   0.025
     Gutter width =   2.000(Ft.)
     Gutter hike from flowline =  2.000(In.)
      Manning's N in gutter =  0.0150
      Manning's N from gutter to grade break =  0.0150
      Manning's N from grade break to crown =  0.0150
     Estimated mean flow rate at midpoint of street =     17.421(CFS)
     Depth of flow =   0.494(Ft.), Average velocity =   2.489(Ft/s)
     Streetflow hydraulics at midpoint of street travel:
     Halfstreet flow width =  18.365(Ft.)
     Flow velocity =   2.49(Ft/s)
     Travel time =    4.49 min.     TC =   20.12  min.
      Adding area flow to street
     SINGLE FAMILY (1/4 Acre Lot)
     Runoff Coefficient = 0.749
     Decimal fraction soil group A = 0.000
     Decimal fraction soil group B = 1.000
     Decimal fraction soil group C = 0.000
     Decimal fraction soil group D = 0.000
     RI index for soil(AMC 2)  =  56.00
     Pervious area fraction =  0.500; Impervious fraction =  0.500
     Rainfall intensity =      2.072(In/Hr) for a   100.0 year storm
     Subarea runoff =     10.399(CFS) for      6.700(Ac.)
     Total runoff =     22.569(CFS)    Total area =      13.500(Ac.)
     Street flow at end of street =     22.569(CFS)
     Half street flow at end of street =     11.285(CFS)
     Depth of flow =   0.539(Ft.), Average velocity =   2.567(Ft/s)
     Warning: depth of flow exceeds top of curb
     Distance that curb overflow reaches into property =    1.54(Ft.)
```

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Flow width (from curb towards crown)=  20.592(Ft.)


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Process from Point/Station      103.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1512.000(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =   678.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.569(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    22.569(CFS)
Normal flow depth in pipe =   20.81(In.)
Flow top width inside pipe =   27.66(In.)
Critical Depth =   19.38(In.)
Pipe flow velocity =      6.21(Ft/s)
Travel time through pipe =    1.82 min.
Time of concentration (TC) =    21.94 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.500(Ac.)
Runoff from this stream =     22.569(CFS)
Time of concentration =   21.94 min.
Rainfall intensity =     1.985(In/Hr)


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Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   844.000(Ft.)
Top (of initial area) elevation =  1522.000(Ft.)
Bottom (of initial area) elevation =  1518.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00474  s(percent)=       0.47
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.512 min.
Rainfall intensity =      2.440(In/Hr) for a   100.0 year storm
MOBILE HOME PARK subarea type
Runoff Coefficient = 0.832
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.250; Impervious fraction =  0.750
Initial subarea runoff =     13.405(CFS)
Total initial stream area =        6.600(Ac.)
Pervious area fraction = 0.250
```



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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1518.000(Ft.)
End of street segment elevation =  1514.000(Ft.)
Length of street segment  =   618.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     21.080(CFS)
Depth of flow =   0.519(Ft.), Average velocity =   2.641(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    0.78(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  19.640(Ft.)
Flow velocity =   2.64(Ft/s)
Travel time =    3.90 min.     TC =   18.41  min.
 Adding area flow to street
MOBILE HOME PARK subarea type
Runoff Coefficient = 0.827
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.250; Impervious fraction =  0.750
Rainfall intensity =      2.166(In/Hr) for a   100.0 year storm
Subarea runoff =     15.221(CFS) for      8.500(Ac.)
Total runoff =     28.626(CFS)    Total area =      15.100(Ac.)
Street flow at end of street =     28.626(CFS)
Half street flow at end of street =     14.313(CFS)
Depth of flow =   0.572(Ft.), Average velocity =   2.763(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    2.87(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


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Process from Point/Station      105.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     15.100(Ac.)
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Runoff from this stream =     28.626(CFS)
Time of concentration =   18.41 min.
Rainfall intensity =     2.166(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       22.569     21.94                 1.985
2       28.626     18.41                 2.166
Largest stream flow has longer or shorter time of concentration
Qp =     28.626 + sum of
        Qa          Tb/Ta
        22.569 *    0.839 =     18.944
Qp =     47.570

Total of 2 streams to confluence:
Flow rates before confluence point:
      22.569      28.626
Area of streams before confluence:
       13.500       15.100
Results of confluence:
Total flow rate =     47.570(CFS)
Time of concentration =    18.413 min.
Effective stream area after confluence =     28.600(Ac.)


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Process from Point/Station      106.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1509.000(Ft.)
Downstream point/station elevation =  1507.000(Ft.)
Pipe length  =   675.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    47.570(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    47.570(CFS)
Normal flow depth in pipe =   34.59(In.)
Flow top width inside pipe =   24.69(In.)
Critical Depth =   26.42(In.)
Pipe flow velocity =      6.12(Ft/s)
Travel time through pipe =    1.84 min.
Time of concentration (TC) =    20.25 min.


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Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.600(Ac.)
Runoff from this stream =     47.570(CFS)
Time of concentration =   20.25 min.
Rainfall intensity =     2.065(In/Hr)
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Process from Point/Station      107.000 to Point/Station      108.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1522.000(Ft.)
Bottom (of initial area) elevation =  1516.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00600  s(percent)=       0.60
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.228 min.
Rainfall intensity =      2.556(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     19.429(CFS)
Total initial stream area =        8.700(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      108.000 to Point/Station      109.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1516.000(Ft.)
End of street segment elevation =  1512.000(Ft.)
Length of street segment  =   765.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     32.865(CFS)
Depth of flow =   0.609(Ft.), Average velocity =   2.677(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    4.37(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.000(Ft.)
Flow velocity =   2.68(Ft/s)
Travel time =    4.76 min.     TC =   17.99  min.
 Adding area flow to street
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COMMERCIAL subarea type
Runoff Coefficient = 0.871
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.191(In/Hr) for a   100.0 year storm
Subarea runoff =     26.719(CFS) for     14.000(Ac.)
Total runoff =     46.148(CFS)    Total area =      22.700(Ac.)
Street flow at end of street =     46.148(CFS)
Half street flow at end of street =     23.074(CFS)
Depth of flow =   0.669(Ft.), Average velocity =   2.963(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    6.76(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


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Process from Point/Station      108.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     22.700(Ac.)
Runoff from this stream =     46.148(CFS)
Time of concentration =   17.99 min.
Rainfall intensity =     2.191(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       47.570     20.25                 2.065
2       46.148     17.99                 2.191
Largest stream flow has longer time of concentration
Qp =     47.570 + sum of
        Qb         Ia/Ib
        46.148 *    0.943 =     43.496
Qp =     91.067

Total of 2 streams to confluence:
Flow rates before confluence point:
      47.570      46.148
Area of streams before confluence:
       28.600       22.700
Results of confluence:
Total flow rate =     91.067(CFS)
Time of concentration =    20.252 min.
Effective stream area after confluence =     51.300(Ac.)


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Process from Point/Station      109.000 to Point/Station      112.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1507.000(Ft.)
Downstream point/station elevation =  1505.000(Ft.)
Pipe length  =   444.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    91.067(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =    91.067(CFS)
Normal flow depth in pipe =   37.13(In.)
Flow top width inside pipe =   40.19(In.)
Critical Depth =   34.69(In.)
Pipe flow velocity =      8.73(Ft/s)
Travel time through pipe =    0.85 min.
Time of concentration (TC) =    21.10 min.


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Process from Point/Station      109.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     51.300(Ac.)
Runoff from this stream =     91.067(CFS)
Time of concentration =   21.10 min.
Rainfall intensity =     2.024(In/Hr)


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Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   665.000(Ft.)
Top (of initial area) elevation =  1517.000(Ft.)
Bottom (of initial area) elevation =  1514.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00451  s(percent)=       0.45
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.896 min.
Rainfall intensity =      2.695(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     16.032(CFS)
Total initial stream area =        6.800(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      111.000 to Point/Station      112.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
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Top of street segment elevation =  1514.000(Ft.)
End of street segment elevation =  1510.000(Ft.)
Length of street segment  =   730.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     23.034(CFS)
Depth of flow =   0.550(Ft.), Average velocity =   2.479(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    1.98(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  21.142(Ft.)
Flow velocity =   2.48(Ft/s)
Travel time =    4.91 min.     TC =   16.80  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.268(In/Hr) for a   100.0 year storm
Subarea runoff =     13.834(CFS) for      7.000(Ac.)
Total runoff =     29.866(CFS)    Total area =      13.800(Ac.)
Street flow at end of street =     29.866(CFS)
Half street flow at end of street =     14.933(CFS)
Depth of flow =   0.590(Ft.), Average velocity =   2.642(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    3.61(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


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Process from Point/Station      111.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     13.800(Ac.)
Runoff from this stream =     29.866(CFS)
Time of concentration =   16.80 min.
Rainfall intensity =     2.268(In/Hr)
Summary of stream data:
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Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       91.067     21.10                  2.024
2       29.866     16.80                  2.268
Largest stream flow has longer time of concentration
Qp =     91.067 + sum of
        Qb         Ia/Ib
        29.866 *    0.892 =     26.652
Qp =    117.719

Total of 2 streams to confluence:
Flow rates before confluence point:
      91.067      29.866
Area of streams before confluence:
       51.300       13.800
Results of confluence:
Total flow rate =    117.719(CFS)
Time of concentration =    21.100 min.
Effective stream area after confluence =     65.100(Ac.)


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Process from Point/Station      112.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1505.000(Ft.)
Downstream point/station elevation =  1503.000(Ft.)
Pipe length  =   885.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   117.719(CFS)
Nearest computed pipe diameter  =     60.00(In.)
Calculated individual pipe flow  =   117.719(CFS)
Normal flow depth in pipe =   46.69(In.)
Flow top width inside pipe =   49.86(In.)
Critical Depth =   37.17(In.)
Pipe flow velocity =      7.18(Ft/s)
Travel time through pipe =    2.06 min.
Time of concentration (TC) =    23.16 min.


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Process from Point/Station      112.000 to Point/Station      116.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     65.100(Ac.)
Runoff from this stream =    117.719(CFS)
Time of concentration =   23.16 min.
Rainfall intensity =     1.932(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      113.000 to Point/Station      116.000
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**** INITIAL AREA EVALUATION ****
____________________________________________________________________
Initial area flow distance =   870.000(Ft.)
Top (of initial area) elevation =  1514.000(Ft.)
Bottom (of initial area) elevation =  1510.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00460  s(percent)=       0.46
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.195 min.
Rainfall intensity =      2.559(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     13.416(CFS)
Total initial stream area =        6.000(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      113.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      6.000(Ac.)
Runoff from this stream =     13.416(CFS)
Time of concentration =   13.20 min.
Rainfall intensity =     2.559(In/Hr)


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Process from Point/Station      114.000 to Point/Station      115.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
Initial area flow distance =   682.000(Ft.)
Top (of initial area) elevation =  1514.000(Ft.)
Bottom (of initial area) elevation =  1511.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00440  s(percent)=       0.44
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.077 min.
Rainfall intensity =      2.675(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      8.188(CFS)
Total initial stream area =        3.500(Ac.)
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Pervious area fraction = 0.100


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Process from Point/Station      115.000 to Point/Station      116.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________
Top of street segment elevation =  1511.000(Ft.)
End of street segment elevation =  1508.000(Ft.)
Length of street segment  =   465.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     12.713(CFS)
Depth of flow =   0.446(Ft.), Average velocity =   2.374(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  15.971(Ft.)
Flow velocity =   2.37(Ft/s)
Travel time =    3.26 min.     TC =   15.34  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.373(In/Hr) for a   100.0 year storm
Subarea runoff =      8.903(CFS) for      4.300(Ac.)
Total runoff =     17.091(CFS)    Total area =       7.800(Ac.)
Street flow at end of street =     17.091(CFS)
Half street flow at end of street =      8.545(CFS)
Depth of flow =   0.486(Ft.), Average velocity =   2.551(Ft/s)
Flow width (from curb towards crown)=  17.952(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      7.800(Ac.)
Runoff from this stream =     17.091(CFS)
Time of concentration =   15.34 min.
Rainfall intensity =     2.373(In/Hr)
```

```
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       13.416     13.20                 2.559
2       17.091     15.34                 2.373
Largest stream flow has longer time of concentration
Qp =     17.091 + sum of
        Qb         Ia/Ib
        13.416 *    0.927 =     12.443
Qp =     29.534

Total of 2 streams to confluence:
Flow rates before confluence point:
      13.416      17.091
Area of streams before confluence:
        6.000        7.800
Results of confluence:
Total flow rate =     29.534(CFS)
Time of concentration =    15.341 min.
Effective stream area after confluence =     13.800(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      116.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     13.800(Ac.)
Runoff from this stream =     29.534(CFS)
Time of concentration =   15.34 min.
Rainfall intensity =     2.373(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1      117.719     23.16              1.932
2       29.534     15.34              2.373
Largest stream flow has longer time of concentration
Qp =    117.719 + sum of
        Qb         Ia/Ib
        29.534 *    0.814 =     24.039
Qp =    141.758

Total of 2 main streams to confluence:
Flow rates before confluence point:
     117.719      29.534
Area of streams before confluence:
       65.100       13.800
```



```
Results of confluence:
Total flow rate =    141.758(CFS)
Time of concentration =    23.156 min.
Effective stream area after confluence  =     78.900(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     78.900(Ac.)
Runoff from this stream =    141.758(CFS)
Time of concentration =   23.16 min.
Rainfall intensity =     1.932(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      118.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   440.000(Ft.)
Top (of initial area) elevation =  1515.000(Ft.)
Bottom (of initial area) elevation =  1513.000(Ft.)
Difference in elevation =     2.000(Ft.)
Slope =    0.00455  s(percent)=       0.45
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.069 min.
Rainfall intensity =      2.929(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     17.198(CFS)
Total initial stream area =        6.700(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      118.000 to Point/Station      119.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  1513.000(Ft.)
End of street segment elevation =  1510.000(Ft.)
Length of street segment  =   550.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
```

```
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     24.728(CFS)
Depth of flow =   0.562(Ft.), Average velocity =   2.499(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    2.49(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  21.778(Ft.)
Flow velocity =   2.50(Ft/s)
Travel time =    3.67 min.     TC =   13.74  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.873
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.508(In/Hr) for a   100.0 year storm
Subarea runoff =     14.896(CFS) for      6.800(Ac.)
Total runoff =     32.095(CFS)    Total area =      13.500(Ac.)
Street flow at end of street =     32.095(CFS)
Half street flow at end of street =     16.047(CFS)
Depth of flow =   0.602(Ft.), Average velocity =   2.697(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    4.08(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1505.000(Ft.)
Downstream point/station elevation =  1503.000(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.095(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    32.095(CFS)
Normal flow depth in pipe =   26.72(In.)
Flow top width inside pipe =   31.49(In.)
Critical Depth =   22.05(In.)
Pipe flow velocity =      5.71(Ft/s)
Travel time through pipe =    2.04 min.
Time of concentration (TC) =    15.78 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
```



```
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     13.500(Ac.)
Runoff from this stream =     32.095(CFS)
Time of concentration =   15.78 min.
Rainfall intensity =     2.340(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1      141.758     23.16                  1.932
2       32.095     15.78                  2.340
Largest stream flow has longer time of concentration
Qp =    141.758 + sum of
        Qb         Ia/Ib
        32.095 *    0.826 =     26.495
Qp =    168.253

Total of 2 streams to confluence:
Flow rates before confluence point:
     141.758      32.095
Area of streams before confluence:
       78.900       13.500
Results of confluence:
Total flow rate =    168.253(CFS)
Time of concentration =    23.156 min.
Effective stream area after confluence =     92.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      116.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1503.000(Ft.)
Downstream point/station elevation =  1499.000(Ft.)
Pipe length  =   557.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   168.253(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =   168.253(CFS)
Normal flow depth in pipe =   44.72(In.)
Flow top width inside pipe =   40.75(In.)
Critical Depth =   45.35(In.)
Pipe flow velocity =     11.94(Ft/s)
Travel time through pipe =    0.78 min.
Time of concentration (TC) =    23.93 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      116.000 to Point/Station      120.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.868
Decimal fraction soil group A = 0.000
```

```
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    23.93 min.
Rainfall intensity =      1.900(In/Hr) for a   100.0 year storm
Subarea runoff =     10.390(CFS) for      6.300(Ac.)
Total runoff =    178.643(CFS)    Total area =      98.700(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      121.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1499.000(Ft.)
Downstream point/station elevation =  1497.000(Ft.)
Pipe length  =   617.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   178.643(CFS)
Nearest computed pipe diameter  =     63.00(In.)
Calculated individual pipe flow  =   178.643(CFS)
Normal flow depth in pipe =   55.88(In.)
Flow top width inside pipe =   39.91(In.)
Critical Depth =   45.43(In.)
Pipe flow velocity =      8.81(Ft/s)
Travel time through pipe =    1.17 min.
Time of concentration (TC) =    25.10 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      121.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.738
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =    25.10 min.
Rainfall intensity =      1.855(In/Hr) for a   100.0 year storm
Subarea runoff =     44.065(CFS) for     32.200(Ac.)
Total runoff =    222.708(CFS)    Total area =     130.900(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      121.000 to Point/Station      122.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  1497.000(Ft.)
Downstream point/station elevation =  1491.000(Ft.)
Pipe length  =  1240.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   222.708(CFS)
Nearest computed pipe diameter  =     66.00(In.)
```



```
Calculated individual pipe flow  =   222.708(CFS)
Normal flow depth in pipe =   51.56(In.)
Flow top width inside pipe =   54.57(In.)
Critical Depth =   50.07(In.)
Pipe flow velocity =     11.19(Ft/s)
Travel time through pipe =    1.85 min.
Time of concentration (TC) =    26.95 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      121.000 to Point/Station      122.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.734
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =    26.95 min.
Rainfall intensity =      1.791(In/Hr) for a   100.0 year storm
Subarea runoff =     44.680(CFS) for     34.000(Ac.)
Total runoff =    267.389(CFS)    Total area =     164.900(Ac.)
End of computations, total study area =          164.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.307
Area averaged RI index number =  56.0
```

Unit Hydrographs 2 Year, 24 Hour, Pre-Project for Mission Pacific Site

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/12/12 File: precond242.out


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

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

-------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



-------------------------------------------------------------------
2 Year, 24 Hour Storm Event
Mission Pacific Site
HCOC Analysis - Pre-Project

-----------------------------------------------------------------
Drainage Area =      27.20(Ac.)  =      0.043 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      27.20(Ac.)  =
0.043 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1060.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.201 Mi.
Difference in elevation =      14.00(Ft.)
Slope along watercourse =     34.8679 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time =    0.117 Hr.
Lag time =     7.04 Min.
25% of lag time =     1.76 Min.
40% of lag time =     2.82 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             1.60                 43.52

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             4.00                108.80

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    27.200           86.00         0.000
 Total Area Entered =     27.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
86.0  71.6      0.343     0.000        0.343       1.000      0.343
                                                    Sum (F) =   0.343
Area averaged mean soil loss (F) (In/Hr) =  0.343
Minimum soil loss rate ((In/Hr)) =  0.172
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
-----------------------------------------------------------------
           Unit Hydrograph Data
-----------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------
    1   0.083         71.008         10.884              2.983
    2   0.167        142.016         40.619             11.135
    3   0.250        213.024         22.803              6.251
    4   0.333        284.031          8.919              2.445
    5   0.417        355.039          5.422              1.486
    6   0.500        426.047          3.579              0.981
    7   0.583        497.055          2.412              0.661
    8   0.667        568.063          1.868              0.512
    9   0.750        639.071          1.315              0.360
   10   0.833        710.079          0.921              0.253
   11   0.917        781.086          0.713              0.196
   12   1.000        852.094          0.544              0.149
                                 Sum = 100.000   Sum=      27.413
-----------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value
```

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.013	(0.608)	0.012	0.001
2	0.17	0.07	0.013	(0.606)	0.012	0.001
3	0.25	0.07	0.013	(0.604)	0.012	0.001
4	0.33	0.10	0.019	(0.601)	0.017	0.002
5	0.42	0.10	0.019	(0.599)	0.017	0.002
6	0.50	0.10	0.019	(0.597)	0.017	0.002
7	0.58	0.10	0.019	(0.594)	0.017	0.002
8	0.67	0.10	0.019	(0.592)	0.017	0.002
9	0.75	0.10	0.019	(0.590)	0.017	0.002
10	0.83	0.13	0.026	(0.587)	0.023	0.003
11	0.92	0.13	0.026	(0.585)	0.023	0.003
12	1.00	0.13	0.026	(0.583)	0.023	0.003
13	1.08	0.10	0.019	(0.580)	0.017	0.002
14	1.17	0.10	0.019	(0.578)	0.017	0.002
15	1.25	0.10	0.019	(0.576)	0.017	0.002
16	1.33	0.10	0.019	(0.573)	0.017	0.002
17	1.42	0.10	0.019	(0.571)	0.017	0.002
18	1.50	0.10	0.019	(0.569)	0.017	0.002
19	1.58	0.10	0.019	(0.567)	0.017	0.002
20	1.67	0.10	0.019	(0.564)	0.017	0.002
21	1.75	0.10	0.019	(0.562)	0.017	0.002
22	1.83	0.13	0.026	(0.560)	0.023	0.003
23	1.92	0.13	0.026	(0.558)	0.023	0.003
24	2.00	0.13	0.026	(0.555)	0.023	0.003
25	2.08	0.13	0.026	(0.553)	0.023	0.003
26	2.17	0.13	0.026	(0.551)	0.023	0.003
27	2.25	0.13	0.026	(0.549)	0.023	0.003
28	2.33	0.13	0.026	(0.546)	0.023	0.003
29	2.42	0.13	0.026	(0.544)	0.023	0.003
30	2.50	0.13	0.026	(0.542)	0.023	0.003
31	2.58	0.17	0.032	(0.540)	0.029	0.003
32	2.67	0.17	0.032	(0.537)	0.029	0.003
33	2.75	0.17	0.032	(0.535)	0.029	0.003
34	2.83	0.17	0.032	(0.533)	0.029	0.003
35	2.92	0.17	0.032	(0.531)	0.029	0.003
36	3.00	0.17	0.032	(0.529)	0.029	0.003
37	3.08	0.17	0.032	(0.526)	0.029	0.003
38	3.17	0.17	0.032	(0.524)	0.029	0.003
39	3.25	0.17	0.032	(0.522)	0.029	0.003
40	3.33	0.17	0.032	(0.520)	0.029	0.003
41	3.42	0.17	0.032	(0.518)	0.029	0.003
42	3.50	0.17	0.032	(0.516)	0.029	0.003
43	3.58	0.17	0.032	(0.513)	0.029	0.003
44	3.67	0.17	0.032	(0.511)	0.029	0.003
45	3.75	0.17	0.032	(0.509)	0.029	0.003
46	3.83	0.20	0.038	(0.507)	0.035	0.004
47	3.92	0.20	0.038	(0.505)	0.035	0.004
48	4.00	0.20	0.038	(0.503)	0.035	0.004
49	4.08	0.20	0.038	(0.501)	0.035	0.004
50	4.17	0.20	0.038	(0.498)	0.035	0.004
51	4.25	0.20	0.038	(0.496)	0.035	0.004
52	4.33	0.23	0.045	(0.494)	0.040	0.004
53	4.42	0.23	0.045	(0.492)	0.040	0.004

54	4.50	0.23	0.045	(0.490)	0.040	0.004
55	4.58	0.23	0.045	(0.488)	0.040	0.004
56	4.67	0.23	0.045	(0.486)	0.040	0.004
57	4.75	0.23	0.045	(0.484)	0.040	0.004
58	4.83	0.27	0.051	(0.482)	0.046	0.005
59	4.92	0.27	0.051	(0.480)	0.046	0.005
60	5.00	0.27	0.051	(0.477)	0.046	0.005
61	5.08	0.20	0.038	(0.475)	0.035	0.004
62	5.17	0.20	0.038	(0.473)	0.035	0.004
63	5.25	0.20	0.038	(0.471)	0.035	0.004
64	5.33	0.23	0.045	(0.469)	0.040	0.004
65	5.42	0.23	0.045	(0.467)	0.040	0.004
66	5.50	0.23	0.045	(0.465)	0.040	0.004
67	5.58	0.27	0.051	(0.463)	0.046	0.005
68	5.67	0.27	0.051	(0.461)	0.046	0.005
69	5.75	0.27	0.051	(0.459)	0.046	0.005
70	5.83	0.27	0.051	(0.457)	0.046	0.005
71	5.92	0.27	0.051	(0.455)	0.046	0.005
72	6.00	0.27	0.051	(0.453)	0.046	0.005
73	6.08	0.30	0.058	(0.451)	0.052	0.006
74	6.17	0.30	0.058	(0.449)	0.052	0.006
75	6.25	0.30	0.058	(0.447)	0.052	0.006
76	6.33	0.30	0.058	(0.445)	0.052	0.006
77	6.42	0.30	0.058	(0.443)	0.052	0.006
78	6.50	0.30	0.058	(0.441)	0.052	0.006
79	6.58	0.33	0.064	(0.439)	0.058	0.006
80	6.67	0.33	0.064	(0.437)	0.058	0.006
81	6.75	0.33	0.064	(0.435)	0.058	0.006
82	6.83	0.33	0.064	(0.433)	0.058	0.006
83	6.92	0.33	0.064	(0.431)	0.058	0.006
84	7.00	0.33	0.064	(0.429)	0.058	0.006
85	7.08	0.33	0.064	(0.427)	0.058	0.006
86	7.17	0.33	0.064	(0.425)	0.058	0.006
87	7.25	0.33	0.064	(0.423)	0.058	0.006
88	7.33	0.37	0.070	(0.421)	0.063	0.007
89	7.42	0.37	0.070	(0.419)	0.063	0.007
90	7.50	0.37	0.070	(0.417)	0.063	0.007
91	7.58	0.40	0.077	(0.416)	0.069	0.008
92	7.67	0.40	0.077	(0.414)	0.069	0.008
93	7.75	0.40	0.077	(0.412)	0.069	0.008
94	7.83	0.43	0.083	(0.410)	0.075	0.008
95	7.92	0.43	0.083	(0.408)	0.075	0.008
96	8.00	0.43	0.083	(0.406)	0.075	0.008
97	8.08	0.50	0.096	(0.404)	0.086	0.010
98	8.17	0.50	0.096	(0.402)	0.086	0.010
99	8.25	0.50	0.096	(0.400)	0.086	0.010
100	8.33	0.50	0.096	(0.399)	0.086	0.010
101	8.42	0.50	0.096	(0.397)	0.086	0.010
102	8.50	0.50	0.096	(0.395)	0.086	0.010
103	8.58	0.53	0.102	(0.393)	0.092	0.010
104	8.67	0.53	0.102	(0.391)	0.092	0.010
105	8.75	0.53	0.102	(0.389)	0.092	0.010
106	8.83	0.57	0.109	(0.387)	0.098	0.011
107	8.92	0.57	0.109	(0.386)	0.098	0.011
108	9.00	0.57	0.109	(0.384)	0.098	0.011
109	9.08	0.63	0.122	(0.382)	0.109	0.012

110	9.17	0.63	0.122	(0.380)	0.109	0.012
111	9.25	0.63	0.122	(0.378)	0.109	0.012
112	9.33	0.67	0.128	(0.377)	0.115	0.013
113	9.42	0.67	0.128	(0.375)	0.115	0.013
114	9.50	0.67	0.128	(0.373)	0.115	0.013
115	9.58	0.70	0.134	(0.371)	0.121	0.013
116	9.67	0.70	0.134	(0.369)	0.121	0.013
117	9.75	0.70	0.134	(0.368)	0.121	0.013
118	9.83	0.73	0.141	(0.366)	0.127	0.014
119	9.92	0.73	0.141	(0.364)	0.127	0.014
120	10.00	0.73	0.141	(0.362)	0.127	0.014
121	10.08	0.50	0.096	(0.361)	0.086	0.010
122	10.17	0.50	0.096	(0.359)	0.086	0.010
123	10.25	0.50	0.096	(0.357)	0.086	0.010
124	10.33	0.50	0.096	(0.355)	0.086	0.010
125	10.42	0.50	0.096	(0.354)	0.086	0.010
126	10.50	0.50	0.096	(0.352)	0.086	0.010
127	10.58	0.67	0.128	(0.350)	0.115	0.013
128	10.67	0.67	0.128	(0.348)	0.115	0.013
129	10.75	0.67	0.128	(0.347)	0.115	0.013
130	10.83	0.67	0.128	(0.345)	0.115	0.013
131	10.92	0.67	0.128	(0.343)	0.115	0.013
132	11.00	0.67	0.128	(0.342)	0.115	0.013
133	11.08	0.63	0.122	(0.340)	0.109	0.012
134	11.17	0.63	0.122	(0.338)	0.109	0.012
135	11.25	0.63	0.122	(0.337)	0.109	0.012
136	11.33	0.63	0.122	(0.335)	0.109	0.012
137	11.42	0.63	0.122	(0.333)	0.109	0.012
138	11.50	0.63	0.122	(0.332)	0.109	0.012
139	11.58	0.57	0.109	(0.330)	0.098	0.011
140	11.67	0.57	0.109	(0.328)	0.098	0.011
141	11.75	0.57	0.109	(0.327)	0.098	0.011
142	11.83	0.60	0.115	(0.325)	0.104	0.012
143	11.92	0.60	0.115	(0.324)	0.104	0.012
144	12.00	0.60	0.115	(0.322)	0.104	0.012
145	12.08	0.83	0.160	(0.320)	0.144	0.016
146	12.17	0.83	0.160	(0.319)	0.144	0.016
147	12.25	0.83	0.160	(0.317)	0.144	0.016
148	12.33	0.87	0.166	(0.316)	0.150	0.017
149	12.42	0.87	0.166	(0.314)	0.150	0.017
150	12.50	0.87	0.166	(0.312)	0.150	0.017
151	12.58	0.93	0.179	(0.311)	0.161	0.018
152	12.67	0.93	0.179	(0.309)	0.161	0.018
153	12.75	0.93	0.179	(0.308)	0.161	0.018
154	12.83	0.97	0.186	(0.306)	0.167	0.019
155	12.92	0.97	0.186	(0.305)	0.167	0.019
156	13.00	0.97	0.186	(0.303)	0.167	0.019
157	13.08	1.13	0.218	(0.301)	0.196	0.022
158	13.17	1.13	0.218	(0.300)	0.196	0.022
159	13.25	1.13	0.218	(0.298)	0.196	0.022
160	13.33	1.13	0.218	(0.297)	0.196	0.022
161	13.42	1.13	0.218	(0.295)	0.196	0.022
162	13.50	1.13	0.218	(0.294)	0.196	0.022
163	13.58	0.77	0.147	(0.292)	0.132	0.015
164	13.67	0.77	0.147	(0.291)	0.132	0.015
165	13.75	0.77	0.147	(0.289)	0.132	0.015

166	13.83	0.77	0.147	(0.288)	0.132	0.015
167	13.92	0.77	0.147	(0.286)	0.132	0.015
168	14.00	0.77	0.147	(0.285)	0.132	0.015
169	14.08	0.90	0.173	(0.284)	0.156	0.017
170	14.17	0.90	0.173	(0.282)	0.156	0.017
171	14.25	0.90	0.173	(0.281)	0.156	0.017
172	14.33	0.87	0.166	(0.279)	0.150	0.017
173	14.42	0.87	0.166	(0.278)	0.150	0.017
174	14.50	0.87	0.166	(0.276)	0.150	0.017
175	14.58	0.87	0.166	(0.275)	0.150	0.017
176	14.67	0.87	0.166	(0.274)	0.150	0.017
177	14.75	0.87	0.166	(0.272)	0.150	0.017
178	14.83	0.83	0.160	(0.271)	0.144	0.016
179	14.92	0.83	0.160	(0.269)	0.144	0.016
180	15.00	0.83	0.160	(0.268)	0.144	0.016
181	15.08	0.80	0.154	(0.267)	0.138	0.015
182	15.17	0.80	0.154	(0.265)	0.138	0.015
183	15.25	0.80	0.154	(0.264)	0.138	0.015
184	15.33	0.77	0.147	(0.263)	0.132	0.015
185	15.42	0.77	0.147	(0.261)	0.132	0.015
186	15.50	0.77	0.147	(0.260)	0.132	0.015
187	15.58	0.63	0.122	(0.259)	0.109	0.012
188	15.67	0.63	0.122	(0.257)	0.109	0.012
189	15.75	0.63	0.122	(0.256)	0.109	0.012
190	15.83	0.63	0.122	(0.255)	0.109	0.012
191	15.92	0.63	0.122	(0.253)	0.109	0.012
192	16.00	0.63	0.122	(0.252)	0.109	0.012
193	16.08	0.13	0.026	(0.251)	0.023	0.003
194	16.17	0.13	0.026	(0.249)	0.023	0.003
195	16.25	0.13	0.026	(0.248)	0.023	0.003
196	16.33	0.13	0.026	(0.247)	0.023	0.003
197	16.42	0.13	0.026	(0.246)	0.023	0.003
198	16.50	0.13	0.026	(0.244)	0.023	0.003
199	16.58	0.10	0.019	(0.243)	0.017	0.002
200	16.67	0.10	0.019	(0.242)	0.017	0.002
201	16.75	0.10	0.019	(0.241)	0.017	0.002
202	16.83	0.10	0.019	(0.239)	0.017	0.002
203	16.92	0.10	0.019	(0.238)	0.017	0.002
204	17.00	0.10	0.019	(0.237)	0.017	0.002
205	17.08	0.17	0.032	(0.236)	0.029	0.003
206	17.17	0.17	0.032	(0.235)	0.029	0.003
207	17.25	0.17	0.032	(0.233)	0.029	0.003
208	17.33	0.17	0.032	(0.232)	0.029	0.003
209	17.42	0.17	0.032	(0.231)	0.029	0.003
210	17.50	0.17	0.032	(0.230)	0.029	0.003
211	17.58	0.17	0.032	(0.229)	0.029	0.003
212	17.67	0.17	0.032	(0.228)	0.029	0.003
213	17.75	0.17	0.032	(0.227)	0.029	0.003
214	17.83	0.13	0.026	(0.225)	0.023	0.003
215	17.92	0.13	0.026	(0.224)	0.023	0.003
216	18.00	0.13	0.026	(0.223)	0.023	0.003
217	18.08	0.13	0.026	(0.222)	0.023	0.003
218	18.17	0.13	0.026	(0.221)	0.023	0.003
219	18.25	0.13	0.026	(0.220)	0.023	0.003
220	18.33	0.13	0.026	(0.219)	0.023	0.003
221	18.42	0.13	0.026	(0.218)	0.023	0.003

222	18.50	0.13	0.026	(0.217)	0.023	0.003
223	18.58	0.10	0.019	(0.216)	0.017	0.002
224	18.67	0.10	0.019	(0.215)	0.017	0.002
225	18.75	0.10	0.019	(0.214)	0.017	0.002
226	18.83	0.07	0.013	(0.213)	0.012	0.001
227	18.92	0.07	0.013	(0.212)	0.012	0.001
228	19.00	0.07	0.013	(0.211)	0.012	0.001
229	19.08	0.10	0.019	(0.210)	0.017	0.002
230	19.17	0.10	0.019	(0.209)	0.017	0.002
231	19.25	0.10	0.019	(0.208)	0.017	0.002
232	19.33	0.13	0.026	(0.207)	0.023	0.003
233	19.42	0.13	0.026	(0.206)	0.023	0.003
234	19.50	0.13	0.026	(0.205)	0.023	0.003
235	19.58	0.10	0.019	(0.204)	0.017	0.002
236	19.67	0.10	0.019	(0.203)	0.017	0.002
237	19.75	0.10	0.019	(0.202)	0.017	0.002
238	19.83	0.07	0.013	(0.201)	0.012	0.001
239	19.92	0.07	0.013	(0.200)	0.012	0.001
240	20.00	0.07	0.013	(0.199)	0.012	0.001
241	20.08	0.10	0.019	(0.198)	0.017	0.002
242	20.17	0.10	0.019	(0.197)	0.017	0.002
243	20.25	0.10	0.019	(0.197)	0.017	0.002
244	20.33	0.10	0.019	(0.196)	0.017	0.002
245	20.42	0.10	0.019	(0.195)	0.017	0.002
246	20.50	0.10	0.019	(0.194)	0.017	0.002
247	20.58	0.10	0.019	(0.193)	0.017	0.002
248	20.67	0.10	0.019	(0.192)	0.017	0.002
249	20.75	0.10	0.019	(0.192)	0.017	0.002
250	20.83	0.07	0.013	(0.191)	0.012	0.001
251	20.92	0.07	0.013	(0.190)	0.012	0.001
252	21.00	0.07	0.013	(0.189)	0.012	0.001
253	21.08	0.10	0.019	(0.189)	0.017	0.002
254	21.17	0.10	0.019	(0.188)	0.017	0.002
255	21.25	0.10	0.019	(0.187)	0.017	0.002
256	21.33	0.07	0.013	(0.186)	0.012	0.001
257	21.42	0.07	0.013	(0.186)	0.012	0.001
258	21.50	0.07	0.013	(0.185)	0.012	0.001
259	21.58	0.10	0.019	(0.184)	0.017	0.002
260	21.67	0.10	0.019	(0.184)	0.017	0.002
261	21.75	0.10	0.019	(0.183)	0.017	0.002
262	21.83	0.07	0.013	(0.182)	0.012	0.001
263	21.92	0.07	0.013	(0.182)	0.012	0.001
264	22.00	0.07	0.013	(0.181)	0.012	0.001
265	22.08	0.10	0.019	(0.181)	0.017	0.002
266	22.17	0.10	0.019	(0.180)	0.017	0.002
267	22.25	0.10	0.019	(0.179)	0.017	0.002
268	22.33	0.07	0.013	(0.179)	0.012	0.001
269	22.42	0.07	0.013	(0.178)	0.012	0.001
270	22.50	0.07	0.013	(0.178)	0.012	0.001
271	22.58	0.07	0.013	(0.177)	0.012	0.001
272	22.67	0.07	0.013	(0.177)	0.012	0.001
273	22.75	0.07	0.013	(0.176)	0.012	0.001
274	22.83	0.07	0.013	(0.176)	0.012	0.001
275	22.92	0.07	0.013	(0.175)	0.012	0.001
276	23.00	0.07	0.013	(0.175)	0.012	0.001
277	23.08	0.07	0.013	(0.175)	0.012	0.001

278	23.17	0.07	0.013	(0.174)	0.012	0.001
279	23.25	0.07	0.013	(0.174)	0.012	0.001
280	23.33	0.07	0.013	(0.173)	0.012	0.001
281	23.42	0.07	0.013	(0.173)	0.012	0.001
282	23.50	0.07	0.013	(0.173)	0.012	0.001
283	23.58	0.07	0.013	(0.173)	0.012	0.001
284	23.67	0.07	0.013	(0.172)	0.012	0.001
285	23.75	0.07	0.013	(0.172)	0.012	0.001
286	23.83	0.07	0.013	(0.172)	0.012	0.001
287	23.92	0.07	0.013	(0.172)	0.012	0.001
288	24.00	0.07	0.013	(0.172)	0.012	0.001

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.9

Flood volume = Effective rainfall 0.16(In)
times area 27.2(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)
Total soil loss = 1.44(In)
Total soil loss = 3.264(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 15796.9 Cubic Feet
Total soil loss = 142172.3 Cubic Feet

Peak flow rate of this hydrograph = 0.590(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q	|	|	|	|
0+10	0.0002	0.02	Q	|	|	|	|
0+15	0.0003	0.03	Q	|	|	|	|
0+20	0.0005	0.03	Q	|	|	|	|
0+25	0.0008	0.04	Q	|	|	|	|
0+30	0.0011	0.05	Q	|	|	|	|
0+35	0.0015	0.05	Q	|	|	|	|
0+40	0.0018	0.05	Q	|	|	|	|
0+45	0.0022	0.05	Q	|	|	|	|
0+50	0.0025	0.05	Q	|	|	|	|
0+55	0.0029	0.06	Q	|	|	|	|
1+ 0	0.0034	0.07	Q	|	|	|	|
1+ 5	0.0038	0.07	Q	|	|	|	|
1+10	0.0042	0.06	Q	|	|	|	|
1+15	0.0046	0.06	Q	|	|	|	|
1+20	0.0050	0.05	Q	|	|	|	|
1+25	0.0054	0.05	Q	|	|	|	|
1+30	0.0057	0.05	Q	|	|	|	|
1+35	0.0061	0.05	Q	|	|	|	|
1+40	0.0065	0.05	Q	|	|	|	|
1+45	0.0068	0.05	Q	|	|	|	|
1+50	0.0072	0.05	Q	|	|	|	|
1+55	0.0076	0.06	Q	|	|	|	|
2+ 0	0.0081	0.07	Q	|	|	|	|

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2+ 5      0.0086      0.07  Q         |         |         |
2+10      0.0090      0.07  Q         |         |         |
2+15      0.0095      0.07  QV        |         |         |
2+20      0.0100      0.07  QV        |         |         |
2+25      0.0105      0.07  QV        |         |         |
2+30      0.0109      0.07  QV        |         |         |
2+35      0.0114      0.07  QV        |         |         |
2+40      0.0120      0.08  QV        |         |         |
2+45      0.0126      0.08  QV        |         |         |
2+50      0.0131      0.08  QV        |         |         |
2+55      0.0137      0.09  QV        |         |         |
3+ 0      0.0143      0.09  QV        |         |         |
3+ 5      0.0149      0.09  QV        |         |         |
3+10      0.0155      0.09  QV        |         |         |
3+15      0.0161      0.09  QV        |         |         |
3+20      0.0167      0.09  QV        |         |         |
3+25      0.0173      0.09  QV        |         |         |
3+30      0.0179      0.09  QV        |         |         |
3+35      0.0185      0.09  Q V       |         |         |
3+40      0.0191      0.09  Q V       |         |         |
3+45      0.0198      0.09  Q V       |         |         |
3+50      0.0204      0.09  Q V       |         |         |
3+55      0.0210      0.10  Q V       |         |         |
4+ 0      0.0217      0.10  Q V       |         |         |
4+ 5      0.0224      0.10  Q V       |         |         |
4+10      0.0231      0.10  Q V       |         |         |
4+15      0.0239      0.10  Q V       |         |         |
4+20      0.0246      0.11  Q V       |         |         |
4+25      0.0254      0.11  Q V       |         |         |
4+30      0.0262      0.12  Q V       |         |         |
4+35      0.0270      0.12  Q V       |         |         |
4+40      0.0278      0.12  Q  V      |         |         |
4+45      0.0287      0.12  Q  V      |         |         |
4+50      0.0295      0.12  Q  V      |         |         |
4+55      0.0304      0.13  Q  V      |         |         |
5+ 0      0.0314      0.14  Q  V      |         |         |
5+ 5      0.0323      0.13  Q  V      |         |         |
5+10      0.0331      0.12  Q  V      |         |         |
5+15      0.0339      0.11  Q  V      |         |         |
5+20      0.0347      0.11  Q  V      |         |         |
5+25      0.0355      0.12  Q  V      |         |         |
5+30      0.0363      0.12  Q   V     |         |         |
5+35      0.0372      0.12  Q   V     |         |         |
5+40      0.0381      0.13  Q   V     |         |         |
5+45      0.0390      0.14  Q   V     |         |         |
5+50      0.0399      0.14  Q   V     |         |         |
5+55      0.0409      0.14  Q   V     |         |         |
6+ 0      0.0418      0.14  Q   V     |         |         |
6+ 5      0.0428      0.14  Q   V     |         |         |
6+10      0.0438      0.15  Q   V     |         |         |
6+15      0.0449      0.15  Q   V     |         |         |
6+20      0.0460      0.15  Q    V    |         |         |
6+25      0.0470      0.16  Q    V    |         |         |
6+30      0.0481      0.16  Q    V    |         |         |
6+35      0.0492      0.16  Q    V    |         |         |
6+40      0.0504      0.17  Q    V    |         |         |
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6+45      0.0515      0.17  Q    V    |         |         |
6+50      0.0527      0.17  Q    V    |         |         |
6+55      0.0539      0.17  Q    V    |         |         |
7+ 0      0.0551      0.17  Q     V   |         |         |
7+ 5      0.0563      0.17  Q     V   |         |         |
7+10      0.0575      0.17  Q     V   |         |         |
7+15      0.0587      0.18  Q     V   |         |         |
7+20      0.0599      0.18  Q     V   |         |         |
7+25      0.0612      0.18  Q     V   |         |         |
7+30      0.0625      0.19  Q     V   |         |         |
7+35      0.0638      0.19  Q      V  |         |         |
7+40      0.0652      0.20  Q      V  |         |         |
7+45      0.0666      0.20  Q      V  |         |         |
7+50      0.0681      0.21  Q      V  |         |         |
7+55      0.0696      0.22  Q      V  |         |         |
8+ 0      0.0711      0.22  Q      V  |         |         |
8+ 5      0.0727      0.23  Q       V |         |         |
8+10      0.0743      0.24  Q       V |         |         |
8+15      0.0761      0.25  |Q      V |         |         |
8+20      0.0778      0.26  |Q      V |         |         |
8+25      0.0796      0.26  |Q      V |         |         |
8+30      0.0814      0.26  |Q      V |         |         |
8+35      0.0832      0.26  |Q       V|         |         |
8+40      0.0851      0.27  |Q       V|         |         |
8+45      0.0870      0.28  |Q       V|         |         |
8+50      0.0889      0.28  |Q       V|         |         |
8+55      0.0909      0.29  |Q        V         |         |
9+ 0      0.0929      0.29  |Q        V         |         |
9+ 5      0.0950      0.30  |Q        V         |         |
9+10      0.0971      0.31  |Q        V         |         |
9+15      0.0993      0.32  |Q        V         |         |
9+20      0.1016      0.33  |Q        |V        |         |
9+25      0.1039      0.34  |Q        |V        |         |
9+30      0.1063      0.34  |Q        |V        |         |
9+35      0.1087      0.35  |Q        |V        |         |
9+40      0.1112      0.36  |Q        | V       |         |
9+45      0.1136      0.36  |Q        | V       |         |
9+50      0.1162      0.37  |Q        | V       |         |
9+55      0.1187      0.37  |Q        |  V      |         |
10+ 0     0.1214      0.38  |Q        |  V      |         |
10+ 5     0.1239      0.37  |Q        |  V      |         |
10+10     0.1261      0.32  |Q        |  V      |         |
10+15     0.1281      0.29  |Q        |   V     |         |
10+20     0.1301      0.28  |Q        |   V     |         |
10+25     0.1320      0.28  |Q        |   V     |         |
10+30     0.1339      0.27  |Q        |   V     |         |
10+35     0.1358      0.28  |Q        |   V     |         |
10+40     0.1379      0.31  |Q        |    V    |         |
10+45     0.1402      0.33  |Q        |    V    |         |
10+50     0.1425      0.34  |Q        |    V    |         |
10+55     0.1449      0.34  |Q        |    V    |         |
11+ 0     0.1473      0.34  |Q        |     V   |         |
11+ 5     0.1496      0.34  |Q        |     V   |         |
11+10     0.1520      0.34  |Q        |     V   |         |
11+15     0.1543      0.34  |Q        |      V  |         |
11+20     0.1566      0.34  |Q        |      V  |         |
```

```
11+25       0.1589      0.34  |Q        |      V  |         |         |
11+30       0.1612      0.33  |Q        |      V  |         |         |
11+35       0.1635      0.33  |Q        |       V |         |         |
11+40       0.1657      0.32  |Q        |       V |         |         |
11+45       0.1678      0.31  |Q        |       V |         |         |
11+50       0.1699      0.31  |Q        |       V |         |         |
11+55       0.1720      0.31  |Q        |       V |         |         |
12+ 0       0.1742      0.31  |Q        |        V|         |         |
12+ 5       0.1765      0.33  |Q        |        V|         |         |
12+10       0.1791      0.38  |Q        |        V|         |         |
12+15       0.1819      0.41  |Q        |         V         |         |
12+20       0.1848      0.42  |Q        |         V         |         |
12+25       0.1877      0.43  |Q        |         V         |         |
12+30       0.1908      0.44  |Q        |         |V        |         |
12+35       0.1939      0.45  |Q        |         |V        |         |
12+40       0.1971      0.47  |Q        |         |V        |         |
12+45       0.2004      0.48  |Q        |         | V       |         |
12+50       0.2037      0.48  |Q        |         | V       |         |
12+55       0.2072      0.50  |Q        |         | V       |         |
13+ 0       0.2106      0.50  | Q       |         |  V      |         |
13+ 5       0.2141      0.51  | Q       |         |  V      |         |
13+10       0.2179      0.55  | Q       |         |   V     |         |
13+15       0.2219      0.57  | Q       |         |   V     |         |
13+20       0.2259      0.58  | Q       |         |   V     |         |
13+25       0.2299      0.59  | Q       |         |    V    |         |
13+30       0.2340      0.59  | Q       |         |    V    |         |
13+35       0.2379      0.57  | Q       |         |     V   |         |
13+40       0.2413      0.49  |Q        |         |     V   |         |
13+45       0.2444      0.45  |Q        |         |     V   |         |
13+50       0.2474      0.43  |Q        |         |      V  |         |
13+55       0.2503      0.43  |Q        |         |      V  |         |
14+ 0       0.2532      0.42  |Q        |         |      V  |         |
14+ 5       0.2561      0.42  |Q        |         |       V |         |
14+10       0.2592      0.45  |Q        |         |       V |         |
14+15       0.2624      0.46  |Q        |         |       V |         |
14+20       0.2656      0.46  |Q        |         |        V|         |
14+25       0.2687      0.46  |Q        |         |        V|         |
14+30       0.2719      0.46  |Q        |         |        V|         |
14+35       0.2750      0.46  |Q        |         |         V         |
14+40       0.2781      0.46  |Q        |         |         V         |
14+45       0.2813      0.46  |Q        |         |         |V        |
14+50       0.2844      0.45  |Q        |         |         |V        |
14+55       0.2875      0.45  |Q        |         |         |V        |
15+ 0       0.2905      0.44  |Q        |         |         | V       |
15+ 5       0.2936      0.44  |Q        |         |         | V       |
15+10       0.2965      0.43  |Q        |         |         | V       |
15+15       0.2995      0.43  |Q        |         |         |  V      |
15+20       0.3024      0.42  |Q        |         |         |  V      |
15+25       0.3053      0.41  |Q        |         |         |  V      |
15+30       0.3081      0.41  |Q        |         |         |  V      |
15+35       0.3108      0.40  |Q        |         |         |   V     |
15+40       0.3134      0.37  |Q        |         |         |   V     |
15+45       0.3158      0.35  |Q        |         |         |   V     |
15+50       0.3182      0.35  |Q        |         |         |    V    |
15+55       0.3206      0.34  |Q        |         |         |    V    |
16+ 0       0.3229      0.34  |Q        |         |         |    V    |
```



```
16+ 5       0.3250      0.31  |Q        |         |         |    V    |
16+10       0.3264      0.20  Q         |         |         |     V   |
16+15       0.3274      0.14  Q         |         |         |     V   |
16+20       0.3282      0.12  Q         |         |         |     V   |
16+25       0.3289      0.10  Q         |         |         |     V   |
16+30       0.3295      0.09  Q         |         |         |     V   |
16+35       0.3300      0.08  Q         |         |         |     V   |
16+40       0.3305      0.07  Q         |         |         |     V   |
16+45       0.3310      0.06  Q         |         |         |     V   |
16+50       0.3314      0.06  Q         |         |         |     V   |
16+55       0.3318      0.06  Q         |         |         |     V   |
17+ 0       0.3321      0.05  Q         |         |         |     V   |
17+ 5       0.3325      0.06  Q         |         |         |     V   |
17+10       0.3330      0.07  Q         |         |         |     V   |
17+15       0.3336      0.08  Q         |         |         |     V   |
17+20       0.3341      0.08  Q         |         |         |     V   |
17+25       0.3347      0.08  Q         |         |         |     V   |
17+30       0.3353      0.09  Q         |         |         |     V   |
17+35       0.3359      0.09  Q         |         |         |      V  |
17+40       0.3365      0.09  Q         |         |         |      V  |
17+45       0.3371      0.09  Q         |         |         |      V  |
17+50       0.3377      0.09  Q         |         |         |      V  |
17+55       0.3382      0.08  Q         |         |         |      V  |
18+ 0       0.3387      0.07  Q         |         |         |      V  |
18+ 5       0.3392      0.07  Q         |         |         |      V  |
18+10       0.3397      0.07  Q         |         |         |      V  |
18+15       0.3402      0.07  Q         |         |         |      V  |
18+20       0.3407      0.07  Q         |         |         |      V  |
18+25       0.3412      0.07  Q         |         |         |      V  |
18+30       0.3417      0.07  Q         |         |         |      V  |
18+35       0.3421      0.07  Q         |         |         |      V  |
18+40       0.3426      0.06  Q         |         |         |      V  |
18+45       0.3430      0.06  Q         |         |         |      V  |
18+50       0.3433      0.05  Q         |         |         |      V  |
18+55       0.3436      0.05  Q         |         |         |      V  |
19+ 0       0.3439      0.04  Q         |         |         |      V  |
19+ 5       0.3442      0.04  Q         |         |         |      V  |
19+10       0.3445      0.05  Q         |         |         |       V |
19+15       0.3449      0.05  Q         |         |         |       V |
19+20       0.3452      0.05  Q         |         |         |       V |
19+25       0.3457      0.06  Q         |         |         |       V |
19+30       0.3461      0.06  Q         |         |         |       V |
19+35       0.3465      0.06  Q         |         |         |       V |
19+40       0.3469      0.06  Q         |         |         |       V |
19+45       0.3473      0.06  Q         |         |         |       V |
19+50       0.3477      0.05  Q         |         |         |       V |
19+55       0.3480      0.04  Q         |         |         |       V |
20+ 0       0.3483      0.04  Q         |         |         |       V |
20+ 5       0.3486      0.04  Q         |         |         |       V |
20+10       0.3489      0.05  Q         |         |         |       V |
20+15       0.3492      0.05  Q         |         |         |       V |
20+20       0.3496      0.05  Q         |         |         |       V |
20+25       0.3499      0.05  Q         |         |         |       V |
20+30       0.3503      0.05  Q         |         |         |       V |
20+35       0.3506      0.05  Q         |         |         |       V |
20+40       0.3510      0.05  Q         |         |         |       V |
```

```
  20+45       0.3514      0.05  Q         |         |         |       V |
  20+50       0.3517      0.05  Q         |         |         |       V |
  20+55       0.3520      0.04  Q         |         |         |       V |
  21+ 0       0.3523      0.04  Q         |         |         |       V |
  21+ 5       0.3526      0.04  Q         |         |         |       V |
  21+10       0.3529      0.05  Q         |         |         |       V |
  21+15       0.3532      0.05  Q         |         |         |       V |
  21+20       0.3536      0.05  Q         |         |         |       V |
  21+25       0.3538      0.04  Q         |         |         |        V|
  21+30       0.3541      0.04  Q         |         |         |        V|
  21+35       0.3544      0.04  Q         |         |         |        V|
  21+40       0.3547      0.05  Q         |         |         |        V|
  21+45       0.3550      0.05  Q         |         |         |        V|
  21+50       0.3554      0.05  Q         |         |         |        V|
  21+55       0.3557      0.04  Q         |         |         |        V|
  22+ 0       0.3559      0.04  Q         |         |         |        V|
  22+ 5       0.3562      0.04  Q         |         |         |        V|
  22+10       0.3565      0.05  Q         |         |         |        V|
  22+15       0.3568      0.05  Q         |         |         |        V|
  22+20       0.3572      0.05  Q         |         |         |        V|
  22+25       0.3575      0.04  Q         |         |         |        V|
  22+30       0.3577      0.04  Q         |         |         |        V|
  22+35       0.3580      0.04  Q         |         |         |        V|
  22+40       0.3582      0.04  Q         |         |         |        V|
  22+45       0.3585      0.04  Q         |         |         |        V|
  22+50       0.3587      0.04  Q         |         |         |        V|
  22+55       0.3590      0.04  Q         |         |         |        V|
  23+ 0       0.3592      0.04  Q         |         |         |        V|
  23+ 5       0.3595      0.04  Q         |         |         |        V|
  23+10       0.3597      0.04  Q         |         |         |        V|
  23+15       0.3600      0.04  Q         |         |         |        V|
  23+20       0.3602      0.04  Q         |         |         |        V|
  23+25       0.3604      0.04  Q         |         |         |        V|
  23+30       0.3607      0.04  Q         |         |         |        V|
  23+35       0.3609      0.04  Q         |         |         |        V|
  23+40       0.3612      0.04  Q         |         |         |        V|
  23+45       0.3614      0.04  Q         |         |         |        V|
  23+50       0.3617      0.04  Q         |         |         |        V|
  23+55       0.3619      0.04  Q         |         |         |        V|
  24+ 0       0.3621      0.04  Q         |         |         |        V|
  24+ 5       0.3624      0.03  Q         |         |         |        V|
  24+10       0.3625      0.02  Q         |         |         |        V|
  24+15       0.3625      0.01  Q         |         |         |        V|
  24+20       0.3626      0.01  Q         |         |         |        V|
  24+25       0.3626      0.00  Q         |         |         |        V|
  24+30       0.3626      0.00  Q         |         |         |        V|
  24+35       0.3626      0.00  Q         |         |         |        V|
  24+40       0.3626      0.00  Q         |         |         |        V|
  24+45       0.3626      0.00  Q         |         |         |        V|
  24+50       0.3626      0.00  Q         |         |         |        V|
  24+55       0.3626      0.00  Q         |         |         |         V
----------------------------------------------------------------------
```

Unit Hydrographs 2 Year, 24 Hour, Post-Project for Mission Pacific Site

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/12/12 File: postcond242.out


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

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

-------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



-------------------------------------------------------------------------
2 Year, 24 Hour Storm Event
Mission Pacific Site Post-Project
HCOC Analysis

-----------------------------------------------------------------------
Drainage Area =      27.20(Ac.)  =      0.043 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      27.20(Ac.)  =
0.043 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1060.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.201 Mi.
Difference in elevation =      14.00(Ft.)
Slope along watercourse =     34.8679 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.070 Hr.
Lag time =     4.22 Min.
25% of lag time =     1.06 Min.
40% of lag time =     1.69 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             1.60                 43.52

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             4.00                108.80

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    27.200           56.00         0.670
 Total Area Entered =     27.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  36.0      0.706     0.670        0.280       1.000      0.280
                                                    Sum (F) =   0.280
Area averaged mean soil loss (F) (In/Hr) =  0.280
Minimum soil loss rate ((In/Hr)) =  0.140
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.357
-------------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
-------------------------------------------------------------------
           Unit Hydrograph Data
-------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
    1   0.083        118.346         24.718              6.776
    2   0.167        236.693         48.764             13.368
    3   0.250        355.039         13.456              3.689
    4   0.333        473.386          6.109              1.675
    5   0.417        591.732          3.415              0.936
    6   0.500        710.079          1.988              0.545
    7   0.583        828.425          1.549              0.425
                                Sum = 100.000   Sum=      27.413
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     0.07      0.013       (  0.497)       0.005        0.008
   2   0.17     0.07      0.013       (  0.495)       0.005        0.008
```

3	0.25	0.07	0.013	(0.493)	0.005	0.008
4	0.33	0.10	0.019	(0.491)	0.007	0.012
5	0.42	0.10	0.019	(0.489)	0.007	0.012
6	0.50	0.10	0.019	(0.487)	0.007	0.012
7	0.58	0.10	0.019	(0.485)	0.007	0.012
8	0.67	0.10	0.019	(0.483)	0.007	0.012
9	0.75	0.10	0.019	(0.482)	0.007	0.012
10	0.83	0.13	0.026	(0.480)	0.009	0.016
11	0.92	0.13	0.026	(0.478)	0.009	0.016
12	1.00	0.13	0.026	(0.476)	0.009	0.016
13	1.08	0.10	0.019	(0.474)	0.007	0.012
14	1.17	0.10	0.019	(0.472)	0.007	0.012
15	1.25	0.10	0.019	(0.470)	0.007	0.012
16	1.33	0.10	0.019	(0.468)	0.007	0.012
17	1.42	0.10	0.019	(0.467)	0.007	0.012
18	1.50	0.10	0.019	(0.465)	0.007	0.012
19	1.58	0.10	0.019	(0.463)	0.007	0.012
20	1.67	0.10	0.019	(0.461)	0.007	0.012
21	1.75	0.10	0.019	(0.459)	0.007	0.012
22	1.83	0.13	0.026	(0.457)	0.009	0.016
23	1.92	0.13	0.026	(0.455)	0.009	0.016
24	2.00	0.13	0.026	(0.454)	0.009	0.016
25	2.08	0.13	0.026	(0.452)	0.009	0.016
26	2.17	0.13	0.026	(0.450)	0.009	0.016
27	2.25	0.13	0.026	(0.448)	0.009	0.016
28	2.33	0.13	0.026	(0.446)	0.009	0.016
29	2.42	0.13	0.026	(0.444)	0.009	0.016
30	2.50	0.13	0.026	(0.443)	0.009	0.016
31	2.58	0.17	0.032	(0.441)	0.011	0.021
32	2.67	0.17	0.032	(0.439)	0.011	0.021
33	2.75	0.17	0.032	(0.437)	0.011	0.021
34	2.83	0.17	0.032	(0.435)	0.011	0.021
35	2.92	0.17	0.032	(0.434)	0.011	0.021
36	3.00	0.17	0.032	(0.432)	0.011	0.021
37	3.08	0.17	0.032	(0.430)	0.011	0.021
38	3.17	0.17	0.032	(0.428)	0.011	0.021
39	3.25	0.17	0.032	(0.426)	0.011	0.021
40	3.33	0.17	0.032	(0.425)	0.011	0.021
41	3.42	0.17	0.032	(0.423)	0.011	0.021
42	3.50	0.17	0.032	(0.421)	0.011	0.021
43	3.58	0.17	0.032	(0.419)	0.011	0.021
44	3.67	0.17	0.032	(0.418)	0.011	0.021
45	3.75	0.17	0.032	(0.416)	0.011	0.021
46	3.83	0.20	0.038	(0.414)	0.014	0.025
47	3.92	0.20	0.038	(0.412)	0.014	0.025
48	4.00	0.20	0.038	(0.411)	0.014	0.025
49	4.08	0.20	0.038	(0.409)	0.014	0.025
50	4.17	0.20	0.038	(0.407)	0.014	0.025
51	4.25	0.20	0.038	(0.405)	0.014	0.025
52	4.33	0.23	0.045	(0.404)	0.016	0.029
53	4.42	0.23	0.045	(0.402)	0.016	0.029
54	4.50	0.23	0.045	(0.400)	0.016	0.029
55	4.58	0.23	0.045	(0.399)	0.016	0.029
56	4.67	0.23	0.045	(0.397)	0.016	0.029
57	4.75	0.23	0.045	(0.395)	0.016	0.029
58	4.83	0.27	0.051	(0.393)	0.018	0.033

59	4.92	0.27	0.051	(0.392)	0.018	0.033
60	5.00	0.27	0.051	(0.390)	0.018	0.033
61	5.08	0.20	0.038	(0.388)	0.014	0.025
62	5.17	0.20	0.038	(0.387)	0.014	0.025
63	5.25	0.20	0.038	(0.385)	0.014	0.025
64	5.33	0.23	0.045	(0.383)	0.016	0.029
65	5.42	0.23	0.045	(0.382)	0.016	0.029
66	5.50	0.23	0.045	(0.380)	0.016	0.029
67	5.58	0.27	0.051	(0.378)	0.018	0.033
68	5.67	0.27	0.051	(0.377)	0.018	0.033
69	5.75	0.27	0.051	(0.375)	0.018	0.033
70	5.83	0.27	0.051	(0.373)	0.018	0.033
71	5.92	0.27	0.051	(0.372)	0.018	0.033
72	6.00	0.27	0.051	(0.370)	0.018	0.033
73	6.08	0.30	0.058	(0.368)	0.021	0.037
74	6.17	0.30	0.058	(0.367)	0.021	0.037
75	6.25	0.30	0.058	(0.365)	0.021	0.037
76	6.33	0.30	0.058	(0.363)	0.021	0.037
77	6.42	0.30	0.058	(0.362)	0.021	0.037
78	6.50	0.30	0.058	(0.360)	0.021	0.037
79	6.58	0.33	0.064	(0.359)	0.023	0.041
80	6.67	0.33	0.064	(0.357)	0.023	0.041
81	6.75	0.33	0.064	(0.355)	0.023	0.041
82	6.83	0.33	0.064	(0.354)	0.023	0.041
83	6.92	0.33	0.064	(0.352)	0.023	0.041
84	7.00	0.33	0.064	(0.351)	0.023	0.041
85	7.08	0.33	0.064	(0.349)	0.023	0.041
86	7.17	0.33	0.064	(0.347)	0.023	0.041
87	7.25	0.33	0.064	(0.346)	0.023	0.041
88	7.33	0.37	0.070	(0.344)	0.025	0.045
89	7.42	0.37	0.070	(0.343)	0.025	0.045
90	7.50	0.37	0.070	(0.341)	0.025	0.045
91	7.58	0.40	0.077	(0.339)	0.027	0.049
92	7.67	0.40	0.077	(0.338)	0.027	0.049
93	7.75	0.40	0.077	(0.336)	0.027	0.049
94	7.83	0.43	0.083	(0.335)	0.030	0.054
95	7.92	0.43	0.083	(0.333)	0.030	0.054
96	8.00	0.43	0.083	(0.332)	0.030	0.054
97	8.08	0.50	0.096	(0.330)	0.034	0.062
98	8.17	0.50	0.096	(0.329)	0.034	0.062
99	8.25	0.50	0.096	(0.327)	0.034	0.062
100	8.33	0.50	0.096	(0.326)	0.034	0.062
101	8.42	0.50	0.096	(0.324)	0.034	0.062
102	8.50	0.50	0.096	(0.323)	0.034	0.062
103	8.58	0.53	0.102	(0.321)	0.037	0.066
104	8.67	0.53	0.102	(0.320)	0.037	0.066
105	8.75	0.53	0.102	(0.318)	0.037	0.066
106	8.83	0.57	0.109	(0.317)	0.039	0.070
107	8.92	0.57	0.109	(0.315)	0.039	0.070
108	9.00	0.57	0.109	(0.314)	0.039	0.070
109	9.08	0.63	0.122	(0.312)	0.043	0.078
110	9.17	0.63	0.122	(0.311)	0.043	0.078
111	9.25	0.63	0.122	(0.309)	0.043	0.078
112	9.33	0.67	0.128	(0.308)	0.046	0.082
113	9.42	0.67	0.128	(0.306)	0.046	0.082
114	9.50	0.67	0.128	(0.305)	0.046	0.082

115	9.58	0.70	0.134	(0.303)	0.048	0.086
116	9.67	0.70	0.134	(0.302)	0.048	0.086
117	9.75	0.70	0.134	(0.300)	0.048	0.086
118	9.83	0.73	0.141	(0.299)	0.050	0.091
119	9.92	0.73	0.141	(0.297)	0.050	0.091
120	10.00	0.73	0.141	(0.296)	0.050	0.091
121	10.08	0.50	0.096	(0.295)	0.034	0.062
122	10.17	0.50	0.096	(0.293)	0.034	0.062
123	10.25	0.50	0.096	(0.292)	0.034	0.062
124	10.33	0.50	0.096	(0.290)	0.034	0.062
125	10.42	0.50	0.096	(0.289)	0.034	0.062
126	10.50	0.50	0.096	(0.287)	0.034	0.062
127	10.58	0.67	0.128	(0.286)	0.046	0.082
128	10.67	0.67	0.128	(0.285)	0.046	0.082
129	10.75	0.67	0.128	(0.283)	0.046	0.082
130	10.83	0.67	0.128	(0.282)	0.046	0.082
131	10.92	0.67	0.128	(0.280)	0.046	0.082
132	11.00	0.67	0.128	(0.279)	0.046	0.082
133	11.08	0.63	0.122	(0.278)	0.043	0.078
134	11.17	0.63	0.122	(0.276)	0.043	0.078
135	11.25	0.63	0.122	(0.275)	0.043	0.078
136	11.33	0.63	0.122	(0.274)	0.043	0.078
137	11.42	0.63	0.122	(0.272)	0.043	0.078
138	11.50	0.63	0.122	(0.271)	0.043	0.078
139	11.58	0.57	0.109	(0.270)	0.039	0.070
140	11.67	0.57	0.109	(0.268)	0.039	0.070
141	11.75	0.57	0.109	(0.267)	0.039	0.070
142	11.83	0.60	0.115	(0.266)	0.041	0.074
143	11.92	0.60	0.115	(0.264)	0.041	0.074
144	12.00	0.60	0.115	(0.263)	0.041	0.074
145	12.08	0.83	0.160	(0.262)	0.057	0.103
146	12.17	0.83	0.160	(0.260)	0.057	0.103
147	12.25	0.83	0.160	(0.259)	0.057	0.103
148	12.33	0.87	0.166	(0.258)	0.059	0.107
149	12.42	0.87	0.166	(0.256)	0.059	0.107
150	12.50	0.87	0.166	(0.255)	0.059	0.107
151	12.58	0.93	0.179	(0.254)	0.064	0.115
152	12.67	0.93	0.179	(0.253)	0.064	0.115
153	12.75	0.93	0.179	(0.251)	0.064	0.115
154	12.83	0.97	0.186	(0.250)	0.066	0.119
155	12.92	0.97	0.186	(0.249)	0.066	0.119
156	13.00	0.97	0.186	(0.248)	0.066	0.119
157	13.08	1.13	0.218	(0.246)	0.078	0.140
158	13.17	1.13	0.218	(0.245)	0.078	0.140
159	13.25	1.13	0.218	(0.244)	0.078	0.140
160	13.33	1.13	0.218	(0.243)	0.078	0.140
161	13.42	1.13	0.218	(0.241)	0.078	0.140
162	13.50	1.13	0.218	(0.240)	0.078	0.140
163	13.58	0.77	0.147	(0.239)	0.053	0.095
164	13.67	0.77	0.147	(0.238)	0.053	0.095
165	13.75	0.77	0.147	(0.236)	0.053	0.095
166	13.83	0.77	0.147	(0.235)	0.053	0.095
167	13.92	0.77	0.147	(0.234)	0.053	0.095
168	14.00	0.77	0.147	(0.233)	0.053	0.095
169	14.08	0.90	0.173	(0.232)	0.062	0.111
170	14.17	0.90	0.173	(0.230)	0.062	0.111

171	14.25	0.90	0.173	(0.229)	0.062	0.111
172	14.33	0.87	0.166	(0.228)	0.059	0.107
173	14.42	0.87	0.166	(0.227)	0.059	0.107
174	14.50	0.87	0.166	(0.226)	0.059	0.107
175	14.58	0.87	0.166	(0.225)	0.059	0.107
176	14.67	0.87	0.166	(0.223)	0.059	0.107
177	14.75	0.87	0.166	(0.222)	0.059	0.107
178	14.83	0.83	0.160	(0.221)	0.057	0.103
179	14.92	0.83	0.160	(0.220)	0.057	0.103
180	15.00	0.83	0.160	(0.219)	0.057	0.103
181	15.08	0.80	0.154	(0.218)	0.055	0.099
182	15.17	0.80	0.154	(0.217)	0.055	0.099
183	15.25	0.80	0.154	(0.216)	0.055	0.099
184	15.33	0.77	0.147	(0.214)	0.053	0.095
185	15.42	0.77	0.147	(0.213)	0.053	0.095
186	15.50	0.77	0.147	(0.212)	0.053	0.095
187	15.58	0.63	0.122	(0.211)	0.043	0.078
188	15.67	0.63	0.122	(0.210)	0.043	0.078
189	15.75	0.63	0.122	(0.209)	0.043	0.078
190	15.83	0.63	0.122	(0.208)	0.043	0.078
191	15.92	0.63	0.122	(0.207)	0.043	0.078
192	16.00	0.63	0.122	(0.206)	0.043	0.078
193	16.08	0.13	0.026	(0.205)	0.009	0.016
194	16.17	0.13	0.026	(0.204)	0.009	0.016
195	16.25	0.13	0.026	(0.203)	0.009	0.016
196	16.33	0.13	0.026	(0.202)	0.009	0.016
197	16.42	0.13	0.026	(0.201)	0.009	0.016
198	16.50	0.13	0.026	(0.200)	0.009	0.016
199	16.58	0.10	0.019	(0.199)	0.007	0.012
200	16.67	0.10	0.019	(0.198)	0.007	0.012
201	16.75	0.10	0.019	(0.197)	0.007	0.012
202	16.83	0.10	0.019	(0.196)	0.007	0.012
203	16.92	0.10	0.019	(0.195)	0.007	0.012
204	17.00	0.10	0.019	(0.194)	0.007	0.012
205	17.08	0.17	0.032	(0.193)	0.011	0.021
206	17.17	0.17	0.032	(0.192)	0.011	0.021
207	17.25	0.17	0.032	(0.191)	0.011	0.021
208	17.33	0.17	0.032	(0.190)	0.011	0.021
209	17.42	0.17	0.032	(0.189)	0.011	0.021
210	17.50	0.17	0.032	(0.188)	0.011	0.021
211	17.58	0.17	0.032	(0.187)	0.011	0.021
212	17.67	0.17	0.032	(0.186)	0.011	0.021
213	17.75	0.17	0.032	(0.185)	0.011	0.021
214	17.83	0.13	0.026	(0.184)	0.009	0.016
215	17.92	0.13	0.026	(0.183)	0.009	0.016
216	18.00	0.13	0.026	(0.182)	0.009	0.016
217	18.08	0.13	0.026	(0.181)	0.009	0.016
218	18.17	0.13	0.026	(0.181)	0.009	0.016
219	18.25	0.13	0.026	(0.180)	0.009	0.016
220	18.33	0.13	0.026	(0.179)	0.009	0.016
221	18.42	0.13	0.026	(0.178)	0.009	0.016
222	18.50	0.13	0.026	(0.177)	0.009	0.016
223	18.58	0.10	0.019	(0.176)	0.007	0.012
224	18.67	0.10	0.019	(0.175)	0.007	0.012
225	18.75	0.10	0.019	(0.174)	0.007	0.012
226	18.83	0.07	0.013	(0.174)	0.005	0.008

227	18.92	0.07	0.013	(0.173)	0.005	0.008
228	19.00	0.07	0.013	(0.172)	0.005	0.008
229	19.08	0.10	0.019	(0.171)	0.007	0.012
230	19.17	0.10	0.019	(0.170)	0.007	0.012
231	19.25	0.10	0.019	(0.170)	0.007	0.012
232	19.33	0.13	0.026	(0.169)	0.009	0.016
233	19.42	0.13	0.026	(0.168)	0.009	0.016
234	19.50	0.13	0.026	(0.167)	0.009	0.016
235	19.58	0.10	0.019	(0.166)	0.007	0.012
236	19.67	0.10	0.019	(0.166)	0.007	0.012
237	19.75	0.10	0.019	(0.165)	0.007	0.012
238	19.83	0.07	0.013	(0.164)	0.005	0.008
239	19.92	0.07	0.013	(0.163)	0.005	0.008
240	20.00	0.07	0.013	(0.163)	0.005	0.008
241	20.08	0.10	0.019	(0.162)	0.007	0.012
242	20.17	0.10	0.019	(0.161)	0.007	0.012
243	20.25	0.10	0.019	(0.161)	0.007	0.012
244	20.33	0.10	0.019	(0.160)	0.007	0.012
245	20.42	0.10	0.019	(0.159)	0.007	0.012
246	20.50	0.10	0.019	(0.159)	0.007	0.012
247	20.58	0.10	0.019	(0.158)	0.007	0.012
248	20.67	0.10	0.019	(0.157)	0.007	0.012
249	20.75	0.10	0.019	(0.157)	0.007	0.012
250	20.83	0.07	0.013	(0.156)	0.005	0.008
251	20.92	0.07	0.013	(0.155)	0.005	0.008
252	21.00	0.07	0.013	(0.155)	0.005	0.008
253	21.08	0.10	0.019	(0.154)	0.007	0.012
254	21.17	0.10	0.019	(0.153)	0.007	0.012
255	21.25	0.10	0.019	(0.153)	0.007	0.012
256	21.33	0.07	0.013	(0.152)	0.005	0.008
257	21.42	0.07	0.013	(0.152)	0.005	0.008
258	21.50	0.07	0.013	(0.151)	0.005	0.008
259	21.58	0.10	0.019	(0.151)	0.007	0.012
260	21.67	0.10	0.019	(0.150)	0.007	0.012
261	21.75	0.10	0.019	(0.150)	0.007	0.012
262	21.83	0.07	0.013	(0.149)	0.005	0.008
263	21.92	0.07	0.013	(0.148)	0.005	0.008
264	22.00	0.07	0.013	(0.148)	0.005	0.008
265	22.08	0.10	0.019	(0.147)	0.007	0.012
266	22.17	0.10	0.019	(0.147)	0.007	0.012
267	22.25	0.10	0.019	(0.147)	0.007	0.012
268	22.33	0.07	0.013	(0.146)	0.005	0.008
269	22.42	0.07	0.013	(0.146)	0.005	0.008
270	22.50	0.07	0.013	(0.145)	0.005	0.008
271	22.58	0.07	0.013	(0.145)	0.005	0.008
272	22.67	0.07	0.013	(0.144)	0.005	0.008
273	22.75	0.07	0.013	(0.144)	0.005	0.008
274	22.83	0.07	0.013	(0.144)	0.005	0.008
275	22.92	0.07	0.013	(0.143)	0.005	0.008
276	23.00	0.07	0.013	(0.143)	0.005	0.008
277	23.08	0.07	0.013	(0.143)	0.005	0.008
278	23.17	0.07	0.013	(0.142)	0.005	0.008
279	23.25	0.07	0.013	(0.142)	0.005	0.008
280	23.33	0.07	0.013	(0.142)	0.005	0.008
281	23.42	0.07	0.013	(0.141)	0.005	0.008
282	23.50	0.07	0.013	(0.141)	0.005	0.008

283	23.58	0.07	0.013	(0.141)	0.005	0.008
284	23.67	0.07	0.013	(0.141)	0.005	0.008
285	23.75	0.07	0.013	(0.141)	0.005	0.008
286	23.83	0.07	0.013	(0.140)	0.005	0.008
287	23.92	0.07	0.013	(0.140)	0.005	0.008
288	24.00	0.07	0.013	(0.140)	0.005	0.008

(Loss Rate Not Used)

Sum = 100.0 Sum = 12.3

Flood volume = Effective rainfall 1.03(In)
times area 27.2(Ac.)/[(In)/(Ft.)] = 2.3(Ac.Ft)
Total soil loss = 0.57(In)
Total soil loss = 1.294(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 101605.8 Cubic Feet
Total soil loss = 56363.4 Cubic Feet

Peak flow rate of this hydrograph = 3.830(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0004	0.06	Q	|	|	|	|
0+10	0.0015	0.17	Q	|	|	|	|
0+15	0.0029	0.20	Q	|	|	|	|
0+20	0.0045	0.24	Q	|	|	|	|
0+25	0.0066	0.30	VQ	|	|	|	|
0+30	0.0088	0.32	VQ	|	|	|	|
0+35	0.0111	0.33	VQ	|	|	|	|
0+40	0.0134	0.33	VQ	|	|	|	|
0+45	0.0157	0.34	VQ	|	|	|	|
0+50	0.0182	0.37	VQ	|	|	|	|
0+55	0.0211	0.42	VQ	|	|	|	|
1+ 0	0.0241	0.44	VQ	|	|	|	|
1+ 5	0.0270	0.42	VQ	|	|	|	|
1+10	0.0295	0.36	VQ	|	|	|	|
1+15	0.0319	0.35	VQ	|	|	|	|
1+20	0.0343	0.35	VQ	|	|	|	|
1+25	0.0367	0.34	VQ	|	|	|	|
1+30	0.0390	0.34	VQ	|	|	|	|
1+35	0.0414	0.34	VQ	|	|	|	|
1+40	0.0437	0.34	VQ	|	|	|	|
1+45	0.0460	0.34	VQ	|	|	|	|
1+50	0.0485	0.37	VQ	|	|	|	|
1+55	0.0515	0.42	VQ	|	|	|	|
2+ 0	0.0545	0.44	VQ	|	|	|	|
2+ 5	0.0575	0.44	VQ	|	|	|	|
2+10	0.0606	0.45	|Q	|	|	|	|
2+15	0.0637	0.45	|Q	|	|	|	|
2+20	0.0668	0.45	|Q	|	|	|	|
2+25	0.0699	0.45	|Q	|	|	|	|

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2+30       0.0730      0.45  |Q        |         |         |         |
2+35       0.0763      0.48  |Q        |         |         |         |
2+40       0.0800      0.53  |VQ       |         |         |         |
2+45       0.0838      0.55  |VQ       |         |         |         |
2+50       0.0876      0.56  |VQ       |         |         |         |
2+55       0.0915      0.56  |VQ       |         |         |         |
3+ 0       0.0954      0.56  |VQ       |         |         |         |
3+ 5       0.0993      0.56  |VQ       |         |         |         |
3+10       0.1031      0.56  |VQ       |         |         |         |
3+15       0.1070      0.56  |VQ       |         |         |         |
3+20       0.1109      0.56  |VQ       |         |         |         |
3+25       0.1148      0.56  |VQ       |         |         |         |
3+30       0.1187      0.56  | Q       |         |         |         |
3+35       0.1226      0.56  | Q       |         |         |         |
3+40       0.1265      0.56  | Q       |         |         |         |
3+45       0.1304      0.56  | Q       |         |         |         |
3+50       0.1344      0.59  | Q       |         |         |         |
3+55       0.1389      0.65  | Q       |         |         |         |
4+ 0       0.1435      0.66  | Q       |         |         |         |
4+ 5       0.1481      0.67  | Q       |         |         |         |
4+10       0.1527      0.67  | Q       |         |         |         |
4+15       0.1574      0.68  | Q       |         |         |         |
4+20       0.1622      0.71  | Q       |         |         |         |
4+25       0.1675      0.76  | VQ      |         |         |         |
4+30       0.1728      0.78  | VQ      |         |         |         |
4+35       0.1782      0.78  |  Q      |         |         |         |
4+40       0.1836      0.79  |  Q      |         |         |         |
4+45       0.1890      0.79  |  Q      |         |         |         |
4+50       0.1947      0.82  |  Q      |         |         |         |
4+55       0.2007      0.87  |  Q      |         |         |         |
5+ 0       0.2068      0.89  |  Q      |         |         |         |
5+ 5       0.2126      0.84  |  Q      |         |         |         |
5+10       0.2176      0.73  | QV      |         |         |         |
5+15       0.2225      0.71  | QV      |         |         |         |
5+20       0.2274      0.72  | QV      |         |         |         |
5+25       0.2327      0.77  |  Q      |         |         |         |
5+30       0.2381      0.78  |  QV     |         |         |         |
5+35       0.2437      0.81  |  QV     |         |         |         |
5+40       0.2497      0.87  |  QV     |         |         |         |
5+45       0.2558      0.89  |  QV     |         |         |         |
5+50       0.2619      0.90  |  QV     |         |         |         |
5+55       0.2681      0.90  |  QV     |         |         |         |
6+ 0       0.2743      0.90  |  QV     |         |         |         |
6+ 5       0.2808      0.93  |  QV     |         |         |         |
6+10       0.2875      0.99  |  QV     |         |         |         |
6+15       0.2944      1.00  |   QV    |         |         |         |
6+20       0.3014      1.01  |   QV    |         |         |         |
6+25       0.3084      1.01  |   QV    |         |         |         |
6+30       0.3153      1.01  |   QV    |         |         |         |
6+35       0.3225      1.04  |   QV    |         |         |         |
6+40       0.3301      1.10  |   QV    |         |         |         |
6+45       0.3378      1.11  |   QV    |         |         |         |
6+50       0.3455      1.12  |   QV    |         |         |         |
6+55       0.3532      1.12  |   Q V   |         |         |         |
7+ 0       0.3610      1.13  |   Q V   |         |         |         |
7+ 5       0.3688      1.13  |   Q V   |         |         |         |
```



```
7+10       0.3766      1.13  |   Q V   |         |         |         |
7+15       0.3843      1.13  |   Q V   |         |         |         |
7+20       0.3923      1.16  |   Q V   |         |         |         |
7+25       0.4006      1.21  |   Q V   |         |         |         |
7+30       0.4091      1.23  |   Q  V  |         |         |         |
7+35       0.4178      1.26  |    Q V  |         |         |         |
7+40       0.4269      1.32  |    Q V  |         |         |         |
7+45       0.4361      1.34  |    Q V  |         |         |         |
7+50       0.4456      1.37  |    Q V  |         |         |         |
7+55       0.4554      1.43  |    Q V  |         |         |         |
8+ 0       0.4654      1.45  |    Q V  |         |         |         |
8+ 5       0.4759      1.52  |     Q V |         |         |         |
8+10       0.4871      1.63  |     Q V |         |         |         |
8+15       0.4985      1.66  |     Q V |         |         |         |
8+20       0.5101      1.68  |     Q V |         |         |         |
8+25       0.5217      1.69  |     Q V |         |         |         |
8+30       0.5333      1.69  |     Q  V|         |         |         |
8+35       0.5452      1.72  |     Q  V|         |         |         |
8+40       0.5574      1.78  |      Q V|         |         |         |
8+45       0.5698      1.79  |      Q V|         |         |         |
8+50       0.5824      1.83  |      Q V|         |         |         |
8+55       0.5953      1.89  |      Q  V         |         |         |
9+ 0       0.6084      1.90  |      Q  V         |         |         |
9+ 5       0.6220      1.97  |      Q  V         |         |         |
9+10       0.6363      2.08  |       Q V         |         |         |
9+15       0.6509      2.11  |       Q |V        |         |         |
9+20       0.6657      2.16  |       Q |V        |         |         |
9+25       0.6810      2.22  |       Q |V        |         |         |
9+30       0.6965      2.24  |       Q |V        |         |         |
9+35       0.7121      2.28  |        Q| V       |         |         |
9+40       0.7282      2.34  |        Q| V       |         |         |
9+45       0.7444      2.35  |        Q| V       |         |         |
9+50       0.7609      2.39  |        Q|  V      |         |         |
9+55       0.7778      2.45  |        Q|  V      |         |         |
10+ 0      0.7948      2.47  |        Q|  V      |         |         |
10+ 5      0.8105      2.28  |        Q|  V      |         |         |
10+10      0.8236      1.90  |      Q  |   V     |         |         |
10+15      0.8359      1.79  |      Q  |   V     |         |         |
10+20      0.8480      1.75  |     Q   |   V     |         |         |
10+25      0.8598      1.72  |     Q   |   V     |         |         |
10+30      0.8716      1.71  |     Q   |   V     |         |         |
10+35      0.8842      1.83  |      Q  |    V    |         |         |
10+40      0.8987      2.11  |       Q |    V    |         |         |
10+45      0.9138      2.18  |       Q |    V    |         |         |
10+50      0.9290      2.22  |       Q |    V    |         |         |
10+55      0.9444      2.24  |       Q |     V   |         |         |
11+ 0      0.9599      2.25  |       Q |     V   |         |         |
11+ 5      0.9753      2.23  |       Q |     V   |         |         |
11+10      0.9903      2.17  |       Q |     V   |         |         |
11+15      1.0051      2.16  |       Q |      V  |         |         |
11+20      1.0200      2.15  |       Q |      V  |         |         |
11+25      1.0348      2.15  |       Q |      V  |         |         |
11+30      1.0496      2.15  |       Q |      V  |         |         |
11+35      1.0639      2.09  |       Q |       V |         |         |
11+40      1.0776      1.98  |      Q  |       V |         |         |
11+45      1.0910      1.95  |      Q  |       V |         |         |
```

```
11+50      1.1045     1.96 |      Q |       V |         |         |
11+55      1.1184     2.01 |       Q |        V|         |         |
12+ 0      1.1323     2.02 |       Q |        V|         |         |
12+ 5      1.1476     2.22 |       Q |        V|         |         |
12+10      1.1655     2.61 |         Q        V|         |         |
12+15      1.1842     2.72 |         Q         V        |         |
12+20      1.2035     2.80 |         |Q        V        |         |
12+25      1.2233     2.88 |         |Q        V        |         |
12+30      1.2433     2.91 |         |Q        |V       |         |
12+35      1.2639     2.98 |         |Q        |V       |         |
12+40      1.2852     3.10 |         | Q       | V      |         |
12+45      1.3068     3.13 |         | Q       | V      |         |
12+50      1.3286     3.17 |         | Q       | V      |         |
12+55      1.3509     3.24 |         | Q       |  V     |         |
13+ 0      1.3733     3.26 |         |  Q      |  V     |         |
13+ 5      1.3968     3.41 |         |  Q      |  V     |         |
13+10      1.4222     3.68 |         |   Q     |   V    |         |
13+15      1.4481     3.76 |         |    Q    |   V    |         |
13+20      1.4743     3.80 |         |    Q    |    V   |         |
13+25      1.5006     3.82 |         |    Q    |    V   |         |
13+30      1.5269     3.83 |         |    Q    |     V  |         |
13+35      1.5512     3.53 |         |   Q     |     V  |         |
13+40      1.5714     2.93 |         |Q        |     V  |         |
13+45      1.5904     2.76 |         |Q        |      V |         |
13+50      1.6089     2.68 |         Q         |      V |         |
13+55      1.6271     2.64 |         Q         |      V |         |
14+ 0      1.6451     2.62 |         Q         |       V|         |
14+ 5      1.6637     2.71 |         Q         |       V|         |
14+10      1.6839     2.93 |         |Q        |       V|         |
14+15      1.7045     2.99 |         |Q        |        V|        |
14+20      1.7251     2.99 |         |Q        |        V|        |
14+25      1.7454     2.95 |         |Q        |        V|        |
14+30      1.7657     2.94 |         |Q        |         V        |
14+35      1.7859     2.94 |         |Q        |         V        |
14+40      1.8062     2.94 |         |Q        |         V        |
14+45      1.8264     2.94 |         |Q        |         |V       |
14+50      1.8464     2.91 |         |Q        |         |V       |
14+55      1.8661     2.85 |         |Q        |         | V      |
15+ 0      1.8856     2.84 |         |Q        |         | V      |
15+ 5      1.9049     2.80 |         |Q        |         | V      |
15+10      1.9238     2.74 |         Q         |         | V      |
15+15      1.9426     2.73 |         Q         |         |  V     |
15+20      1.9611     2.69 |         Q         |         |  V     |
15+25      1.9792     2.63 |         Q         |         |  V     |
15+30      1.9972     2.61 |         Q         |         |   V    |
15+35      2.0144     2.49 |        Q|         |         |   V    |
15+40      2.0300     2.27 |        Q|         |         |   V    |
15+45      2.0452     2.21 |       Q |         |         |    V   |
15+50      2.0602     2.18 |       Q |         |         |    V   |
15+55      2.0751     2.16 |       Q |         |         |    V   |
16+ 0      2.0899     2.15 |       Q |         |         |    V   |
16+ 5      2.1018     1.73 |     Q   |         |         |     V  |
16+10      2.1080     0.90 |  Q      |         |         |     V  |
16+15      2.1126     0.67 | Q       |         |         |     V  |
16+20      2.1165     0.57 | Q       |         |         |     V  |
16+25      2.1200     0.51 | Q       |         |         |     V  |
```



```
16+30      2.1233     0.48 |Q        |         |         |     V  |
16+35      2.1263     0.42 |Q        |         |         |     V  |
16+40      2.1288     0.37 |Q        |         |         |     V  |
16+45      2.1312     0.35 |Q        |         |         |     V  |
16+50      2.1336     0.35 |Q        |         |         |     V  |
16+55      2.1360     0.34 |Q        |         |         |     V  |
17+ 0      2.1383     0.34 |Q        |         |         |     V  |
17+ 5      2.1410     0.39 |Q        |         |         |     V  |
17+10      2.1445     0.50 | Q       |         |         |     V  |
17+15      2.1482     0.53 | Q       |         |         |     V  |
17+20      2.1520     0.55 | Q       |         |         |     V  |
17+25      2.1558     0.56 | Q       |         |         |     V  |
17+30      2.1597     0.56 | Q       |         |         |      V |
17+35      2.1636     0.56 | Q       |         |         |      V |
17+40      2.1674     0.56 | Q       |         |         |      V |
17+45      2.1713     0.56 | Q       |         |         |      V |
17+50      2.1750     0.54 | Q       |         |         |      V |
17+55      2.1783     0.48 |Q        |         |         |      V |
18+ 0      2.1816     0.47 |Q        |         |         |      V |
18+ 5      2.1847     0.46 |Q        |         |         |      V |
18+10      2.1879     0.46 |Q        |         |         |      V |
18+15      2.1910     0.45 |Q        |         |         |      V |
18+20      2.1941     0.45 |Q        |         |         |      V |
18+25      2.1972     0.45 |Q        |         |         |      V |
18+30      2.2003     0.45 |Q        |         |         |      V |
18+35      2.2032     0.42 |Q        |         |         |      V |
18+40      2.2058     0.37 |Q        |         |         |      V |
18+45      2.2082     0.35 |Q        |         |         |      V |
18+50      2.2104     0.32 |Q        |         |         |      V |
18+55      2.2122     0.26 |Q        |         |         |      V |
19+ 0      2.2139     0.24 Q         |         |         |      V |
19+ 5      2.2157     0.26 |Q        |         |         |      V |
19+10      2.2178     0.31 |Q        |         |         |       V|
19+15      2.2201     0.33 |Q        |         |         |       V|
19+20      2.2225     0.36 |Q        |         |         |       V|
19+25      2.2254     0.42 |Q        |         |         |       V|
19+30      2.2284     0.44 |Q        |         |         |       V|
19+35      2.2313     0.42 |Q        |         |         |       V|
19+40      2.2338     0.36 |Q        |         |         |       V|
19+45      2.2362     0.35 |Q        |         |         |       V|
19+50      2.2384     0.32 |Q        |         |         |       V|
19+55      2.2402     0.26 |Q        |         |         |       V|
20+ 0      2.2418     0.24 Q         |         |         |       V|
20+ 5      2.2436     0.26 |Q        |         |         |       V|
20+10      2.2458     0.31 |Q        |         |         |       V|
20+15      2.2480     0.33 |Q        |         |         |       V|
20+20      2.2503     0.33 |Q        |         |         |       V|
20+25      2.2526     0.33 |Q        |         |         |       V|
20+30      2.2549     0.34 |Q        |         |         |       V|
20+35      2.2573     0.34 |Q        |         |         |       V|
20+40      2.2596     0.34 |Q        |         |         |       V|
20+45      2.2619     0.34 |Q        |         |         |       V|
20+50      2.2641     0.31 |Q        |         |         |       V|
20+55      2.2658     0.26 |Q        |         |         |       V|
21+ 0      2.2675     0.24 Q         |         |         |       V|
21+ 5      2.2693     0.26 |Q        |         |         |       V|
```

```
   21+10       2.2715      0.31  |Q        |         |         |       V |
   21+15       2.2737      0.33  |Q        |         |         |       V |
   21+20       2.2758      0.30  |Q        |         |         |        V|
   21+25       2.2775      0.25  |Q        |         |         |        V|
   21+30       2.2792      0.24  Q         |         |         |        V|
   21+35       2.2810      0.26  |Q        |         |         |        V|
   21+40       2.2831      0.31  |Q        |         |         |        V|
   21+45       2.2854      0.33  |Q        |         |         |        V|
   21+50       2.2874      0.30  |Q        |         |         |        V|
   21+55       2.2892      0.25  |Q        |         |         |        V|
   22+ 0       2.2908      0.24  Q         |         |         |        V|
   22+ 5       2.2926      0.26  |Q        |         |         |        V|
   22+10       2.2948      0.31  |Q        |         |         |        V|
   22+15       2.2970      0.33  |Q        |         |         |        V|
   22+20       2.2991      0.30  |Q        |         |         |        V|
   22+25       2.3008      0.25  |Q        |         |         |        V|
   22+30       2.3025      0.24  Q         |         |         |        V|
   22+35       2.3041      0.23  Q         |         |         |        V|
   22+40       2.3057      0.23  Q         |         |         |        V|
   22+45       2.3072      0.23  Q         |         |         |        V|
   22+50       2.3088      0.23  Q         |         |         |        V|
   22+55       2.3104      0.23  Q         |         |         |        V|
   23+ 0       2.3119      0.23  Q         |         |         |        V|
   23+ 5       2.3135      0.23  Q         |         |         |        V|
   23+10       2.3150      0.23  Q         |         |         |        V|
   23+15       2.3166      0.23  Q         |         |         |        V|
   23+20       2.3181      0.23  Q         |         |         |        V|
   23+25       2.3197      0.23  Q         |         |         |        V|
   23+30       2.3212      0.23  Q         |         |         |        V|
   23+35       2.3228      0.23  Q         |         |         |        V|
   23+40       2.3244      0.23  Q         |         |         |        V|
   23+45       2.3259      0.23  Q         |         |         |        V|
   23+50       2.3275      0.23  Q         |         |         |        V|
   23+55       2.3290      0.23  Q         |         |         |        V|
   24+ 0       2.3306      0.23  Q         |         |         |        V|
   24+ 5       2.3317      0.17  Q         |         |         |        V|
   24+10       2.3322      0.06  Q         |         |         |        V|
   24+15       2.3324      0.03  Q         |         |         |        V|
   24+20       2.3325      0.02  Q         |         |         |        V|
   24+25       2.3325      0.01  Q         |         |         |        V|
   24+30       2.3325      0.00  Q         |         |         |        V|
-----------------------------------------------------------------------
```

Unit Hydrographs 2 Year, 24 Hour, Pre-Project for Walmart Site

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/07/12 File: PreCond242.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



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



-------------------------------------------------------------------
Drainage Area =      28.80(Ac.)  =      0.045 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      28.80(Ac.)  =
0.045 Sq. Mi.
Length along longest watercourse =    1530.00(Ft.)
Length along longest watercourse measured to centroid =     770.00(Ft.)
Length along longest watercourse =      0.290 Mi.
Length along longest watercourse measured to centroid =      0.146 Mi.
Difference in elevation =      10.00(Ft.)
Slope along watercourse =     34.5098 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time =    0.092 Hr.
Lag time =     5.52 Min.
25% of lag time =     1.38 Min.
40% of lag time =     2.21 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       28.80             1.60                 46.08

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       28.80             4.00                115.20

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    28.800           86.00         0.000
 Total Area Entered =     28.80(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
86.0  71.6      0.343     0.000        0.343       1.000      0.343
                                                    Sum (F) =   0.343
Area averaged mean soil loss (F) (In/Hr) =  0.343
Minimum soil loss rate ((In/Hr)) =  0.172
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
--------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
-------------------------------------------------------------------
           Unit Hydrograph Data
-------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
    1   0.083         90.579         16.349              4.745
    2   0.167        181.159         47.197             13.699
    3   0.250        271.738         17.300              5.021
    4   0.333        362.317          7.608              2.208
    5   0.417        452.897          4.395              1.276
    6   0.500        543.476          2.813              0.816
    7   0.583        634.055          1.909              0.554
    8   0.667        724.635          1.217              0.353
    9   0.750        815.214          1.212              0.352
                                Sum = 100.000   Sum=      29.025
-------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
```

1	0.08	0.07	0.013	(0.608)	0.012	0.001
2	0.17	0.07	0.013	(0.606)	0.012	0.001
3	0.25	0.07	0.013	(0.604)	0.012	0.001
4	0.33	0.10	0.019	(0.601)	0.017	0.002
5	0.42	0.10	0.019	(0.599)	0.017	0.002
6	0.50	0.10	0.019	(0.597)	0.017	0.002
7	0.58	0.10	0.019	(0.594)	0.017	0.002
8	0.67	0.10	0.019	(0.592)	0.017	0.002
9	0.75	0.10	0.019	(0.590)	0.017	0.002
10	0.83	0.13	0.026	(0.587)	0.023	0.003
11	0.92	0.13	0.026	(0.585)	0.023	0.003
12	1.00	0.13	0.026	(0.583)	0.023	0.003
13	1.08	0.10	0.019	(0.580)	0.017	0.002
14	1.17	0.10	0.019	(0.578)	0.017	0.002
15	1.25	0.10	0.019	(0.576)	0.017	0.002
16	1.33	0.10	0.019	(0.573)	0.017	0.002
17	1.42	0.10	0.019	(0.571)	0.017	0.002
18	1.50	0.10	0.019	(0.569)	0.017	0.002
19	1.58	0.10	0.019	(0.567)	0.017	0.002
20	1.67	0.10	0.019	(0.564)	0.017	0.002
21	1.75	0.10	0.019	(0.562)	0.017	0.002
22	1.83	0.13	0.026	(0.560)	0.023	0.003
23	1.92	0.13	0.026	(0.558)	0.023	0.003
24	2.00	0.13	0.026	(0.555)	0.023	0.003
25	2.08	0.13	0.026	(0.553)	0.023	0.003
26	2.17	0.13	0.026	(0.551)	0.023	0.003
27	2.25	0.13	0.026	(0.549)	0.023	0.003
28	2.33	0.13	0.026	(0.546)	0.023	0.003
29	2.42	0.13	0.026	(0.544)	0.023	0.003
30	2.50	0.13	0.026	(0.542)	0.023	0.003
31	2.58	0.17	0.032	(0.540)	0.029	0.003
32	2.67	0.17	0.032	(0.537)	0.029	0.003
33	2.75	0.17	0.032	(0.535)	0.029	0.003
34	2.83	0.17	0.032	(0.533)	0.029	0.003
35	2.92	0.17	0.032	(0.531)	0.029	0.003
36	3.00	0.17	0.032	(0.529)	0.029	0.003
37	3.08	0.17	0.032	(0.526)	0.029	0.003
38	3.17	0.17	0.032	(0.524)	0.029	0.003
39	3.25	0.17	0.032	(0.522)	0.029	0.003
40	3.33	0.17	0.032	(0.520)	0.029	0.003
41	3.42	0.17	0.032	(0.518)	0.029	0.003
42	3.50	0.17	0.032	(0.516)	0.029	0.003
43	3.58	0.17	0.032	(0.513)	0.029	0.003
44	3.67	0.17	0.032	(0.511)	0.029	0.003
45	3.75	0.17	0.032	(0.509)	0.029	0.003
46	3.83	0.20	0.038	(0.507)	0.035	0.004
47	3.92	0.20	0.038	(0.505)	0.035	0.004
48	4.00	0.20	0.038	(0.503)	0.035	0.004
49	4.08	0.20	0.038	(0.501)	0.035	0.004
50	4.17	0.20	0.038	(0.498)	0.035	0.004
51	4.25	0.20	0.038	(0.496)	0.035	0.004
52	4.33	0.23	0.045	(0.494)	0.040	0.004
53	4.42	0.23	0.045	(0.492)	0.040	0.004
54	4.50	0.23	0.045	(0.490)	0.040	0.004
55	4.58	0.23	0.045	(0.488)	0.040	0.004
56	4.67	0.23	0.045	(0.486)	0.040	0.004

57	4.75	0.23	0.045	(0.484)	0.040	0.004
58	4.83	0.27	0.051	(0.482)	0.046	0.005
59	4.92	0.27	0.051	(0.480)	0.046	0.005
60	5.00	0.27	0.051	(0.477)	0.046	0.005
61	5.08	0.20	0.038	(0.475)	0.035	0.004
62	5.17	0.20	0.038	(0.473)	0.035	0.004
63	5.25	0.20	0.038	(0.471)	0.035	0.004
64	5.33	0.23	0.045	(0.469)	0.040	0.004
65	5.42	0.23	0.045	(0.467)	0.040	0.004
66	5.50	0.23	0.045	(0.465)	0.040	0.004
67	5.58	0.27	0.051	(0.463)	0.046	0.005
68	5.67	0.27	0.051	(0.461)	0.046	0.005
69	5.75	0.27	0.051	(0.459)	0.046	0.005
70	5.83	0.27	0.051	(0.457)	0.046	0.005
71	5.92	0.27	0.051	(0.455)	0.046	0.005
72	6.00	0.27	0.051	(0.453)	0.046	0.005
73	6.08	0.30	0.058	(0.451)	0.052	0.006
74	6.17	0.30	0.058	(0.449)	0.052	0.006
75	6.25	0.30	0.058	(0.447)	0.052	0.006
76	6.33	0.30	0.058	(0.445)	0.052	0.006
77	6.42	0.30	0.058	(0.443)	0.052	0.006
78	6.50	0.30	0.058	(0.441)	0.052	0.006
79	6.58	0.33	0.064	(0.439)	0.058	0.006
80	6.67	0.33	0.064	(0.437)	0.058	0.006
81	6.75	0.33	0.064	(0.435)	0.058	0.006
82	6.83	0.33	0.064	(0.433)	0.058	0.006
83	6.92	0.33	0.064	(0.431)	0.058	0.006
84	7.00	0.33	0.064	(0.429)	0.058	0.006
85	7.08	0.33	0.064	(0.427)	0.058	0.006
86	7.17	0.33	0.064	(0.425)	0.058	0.006
87	7.25	0.33	0.064	(0.423)	0.058	0.006
88	7.33	0.37	0.070	(0.421)	0.063	0.007
89	7.42	0.37	0.070	(0.419)	0.063	0.007
90	7.50	0.37	0.070	(0.417)	0.063	0.007
91	7.58	0.40	0.077	(0.416)	0.069	0.008
92	7.67	0.40	0.077	(0.414)	0.069	0.008
93	7.75	0.40	0.077	(0.412)	0.069	0.008
94	7.83	0.43	0.083	(0.410)	0.075	0.008
95	7.92	0.43	0.083	(0.408)	0.075	0.008
96	8.00	0.43	0.083	(0.406)	0.075	0.008
97	8.08	0.50	0.096	(0.404)	0.086	0.010
98	8.17	0.50	0.096	(0.402)	0.086	0.010
99	8.25	0.50	0.096	(0.400)	0.086	0.010
100	8.33	0.50	0.096	(0.399)	0.086	0.010
101	8.42	0.50	0.096	(0.397)	0.086	0.010
102	8.50	0.50	0.096	(0.395)	0.086	0.010
103	8.58	0.53	0.102	(0.393)	0.092	0.010
104	8.67	0.53	0.102	(0.391)	0.092	0.010
105	8.75	0.53	0.102	(0.389)	0.092	0.010
106	8.83	0.57	0.109	(0.387)	0.098	0.011
107	8.92	0.57	0.109	(0.386)	0.098	0.011
108	9.00	0.57	0.109	(0.384)	0.098	0.011
109	9.08	0.63	0.122	(0.382)	0.109	0.012
110	9.17	0.63	0.122	(0.380)	0.109	0.012
111	9.25	0.63	0.122	(0.378)	0.109	0.012
112	9.33	0.67	0.128	(0.377)	0.115	0.013

113	9.42	0.67	0.128	(0.375)	0.115	0.013
114	9.50	0.67	0.128	(0.373)	0.115	0.013
115	9.58	0.70	0.134	(0.371)	0.121	0.013
116	9.67	0.70	0.134	(0.369)	0.121	0.013
117	9.75	0.70	0.134	(0.368)	0.121	0.013
118	9.83	0.73	0.141	(0.366)	0.127	0.014
119	9.92	0.73	0.141	(0.364)	0.127	0.014
120	10.00	0.73	0.141	(0.362)	0.127	0.014
121	10.08	0.50	0.096	(0.361)	0.086	0.010
122	10.17	0.50	0.096	(0.359)	0.086	0.010
123	10.25	0.50	0.096	(0.357)	0.086	0.010
124	10.33	0.50	0.096	(0.355)	0.086	0.010
125	10.42	0.50	0.096	(0.354)	0.086	0.010
126	10.50	0.50	0.096	(0.352)	0.086	0.010
127	10.58	0.67	0.128	(0.350)	0.115	0.013
128	10.67	0.67	0.128	(0.348)	0.115	0.013
129	10.75	0.67	0.128	(0.347)	0.115	0.013
130	10.83	0.67	0.128	(0.345)	0.115	0.013
131	10.92	0.67	0.128	(0.343)	0.115	0.013
132	11.00	0.67	0.128	(0.342)	0.115	0.013
133	11.08	0.63	0.122	(0.340)	0.109	0.012
134	11.17	0.63	0.122	(0.338)	0.109	0.012
135	11.25	0.63	0.122	(0.337)	0.109	0.012
136	11.33	0.63	0.122	(0.335)	0.109	0.012
137	11.42	0.63	0.122	(0.333)	0.109	0.012
138	11.50	0.63	0.122	(0.332)	0.109	0.012
139	11.58	0.57	0.109	(0.330)	0.098	0.011
140	11.67	0.57	0.109	(0.328)	0.098	0.011
141	11.75	0.57	0.109	(0.327)	0.098	0.011
142	11.83	0.60	0.115	(0.325)	0.104	0.012
143	11.92	0.60	0.115	(0.324)	0.104	0.012
144	12.00	0.60	0.115	(0.322)	0.104	0.012
145	12.08	0.83	0.160	(0.320)	0.144	0.016
146	12.17	0.83	0.160	(0.319)	0.144	0.016
147	12.25	0.83	0.160	(0.317)	0.144	0.016
148	12.33	0.87	0.166	(0.316)	0.150	0.017
149	12.42	0.87	0.166	(0.314)	0.150	0.017
150	12.50	0.87	0.166	(0.312)	0.150	0.017
151	12.58	0.93	0.179	(0.311)	0.161	0.018
152	12.67	0.93	0.179	(0.309)	0.161	0.018
153	12.75	0.93	0.179	(0.308)	0.161	0.018
154	12.83	0.97	0.186	(0.306)	0.167	0.019
155	12.92	0.97	0.186	(0.305)	0.167	0.019
156	13.00	0.97	0.186	(0.303)	0.167	0.019
157	13.08	1.13	0.218	(0.301)	0.196	0.022
158	13.17	1.13	0.218	(0.300)	0.196	0.022
159	13.25	1.13	0.218	(0.298)	0.196	0.022
160	13.33	1.13	0.218	(0.297)	0.196	0.022
161	13.42	1.13	0.218	(0.295)	0.196	0.022
162	13.50	1.13	0.218	(0.294)	0.196	0.022
163	13.58	0.77	0.147	(0.292)	0.132	0.015
164	13.67	0.77	0.147	(0.291)	0.132	0.015
165	13.75	0.77	0.147	(0.289)	0.132	0.015
166	13.83	0.77	0.147	(0.288)	0.132	0.015
167	13.92	0.77	0.147	(0.286)	0.132	0.015
168	14.00	0.77	0.147	(0.285)	0.132	0.015

169	14.08	0.90	0.173	(0.284)	0.156	0.017
170	14.17	0.90	0.173	(0.282)	0.156	0.017
171	14.25	0.90	0.173	(0.281)	0.156	0.017
172	14.33	0.87	0.166	(0.279)	0.150	0.017
173	14.42	0.87	0.166	(0.278)	0.150	0.017
174	14.50	0.87	0.166	(0.276)	0.150	0.017
175	14.58	0.87	0.166	(0.275)	0.150	0.017
176	14.67	0.87	0.166	(0.274)	0.150	0.017
177	14.75	0.87	0.166	(0.272)	0.150	0.017
178	14.83	0.83	0.160	(0.271)	0.144	0.016
179	14.92	0.83	0.160	(0.269)	0.144	0.016
180	15.00	0.83	0.160	(0.268)	0.144	0.016
181	15.08	0.80	0.154	(0.267)	0.138	0.015
182	15.17	0.80	0.154	(0.265)	0.138	0.015
183	15.25	0.80	0.154	(0.264)	0.138	0.015
184	15.33	0.77	0.147	(0.263)	0.132	0.015
185	15.42	0.77	0.147	(0.261)	0.132	0.015
186	15.50	0.77	0.147	(0.260)	0.132	0.015
187	15.58	0.63	0.122	(0.259)	0.109	0.012
188	15.67	0.63	0.122	(0.257)	0.109	0.012
189	15.75	0.63	0.122	(0.256)	0.109	0.012
190	15.83	0.63	0.122	(0.255)	0.109	0.012
191	15.92	0.63	0.122	(0.253)	0.109	0.012
192	16.00	0.63	0.122	(0.252)	0.109	0.012
193	16.08	0.13	0.026	(0.251)	0.023	0.003
194	16.17	0.13	0.026	(0.249)	0.023	0.003
195	16.25	0.13	0.026	(0.248)	0.023	0.003
196	16.33	0.13	0.026	(0.247)	0.023	0.003
197	16.42	0.13	0.026	(0.246)	0.023	0.003
198	16.50	0.13	0.026	(0.244)	0.023	0.003
199	16.58	0.10	0.019	(0.243)	0.017	0.002
200	16.67	0.10	0.019	(0.242)	0.017	0.002
201	16.75	0.10	0.019	(0.241)	0.017	0.002
202	16.83	0.10	0.019	(0.239)	0.017	0.002
203	16.92	0.10	0.019	(0.238)	0.017	0.002
204	17.00	0.10	0.019	(0.237)	0.017	0.002
205	17.08	0.17	0.032	(0.236)	0.029	0.003
206	17.17	0.17	0.032	(0.235)	0.029	0.003
207	17.25	0.17	0.032	(0.233)	0.029	0.003
208	17.33	0.17	0.032	(0.232)	0.029	0.003
209	17.42	0.17	0.032	(0.231)	0.029	0.003
210	17.50	0.17	0.032	(0.230)	0.029	0.003
211	17.58	0.17	0.032	(0.229)	0.029	0.003
212	17.67	0.17	0.032	(0.228)	0.029	0.003
213	17.75	0.17	0.032	(0.227)	0.029	0.003
214	17.83	0.13	0.026	(0.225)	0.023	0.003
215	17.92	0.13	0.026	(0.224)	0.023	0.003
216	18.00	0.13	0.026	(0.223)	0.023	0.003
217	18.08	0.13	0.026	(0.222)	0.023	0.003
218	18.17	0.13	0.026	(0.221)	0.023	0.003
219	18.25	0.13	0.026	(0.220)	0.023	0.003
220	18.33	0.13	0.026	(0.219)	0.023	0.003
221	18.42	0.13	0.026	(0.218)	0.023	0.003
222	18.50	0.13	0.026	(0.217)	0.023	0.003
223	18.58	0.10	0.019	(0.216)	0.017	0.002
224	18.67	0.10	0.019	(0.215)	0.017	0.002

225	18.75	0.10	0.019	(0.214)	0.017	0.002
226	18.83	0.07	0.013	(0.213)	0.012	0.001
227	18.92	0.07	0.013	(0.212)	0.012	0.001
228	19.00	0.07	0.013	(0.211)	0.012	0.001
229	19.08	0.10	0.019	(0.210)	0.017	0.002
230	19.17	0.10	0.019	(0.209)	0.017	0.002
231	19.25	0.10	0.019	(0.208)	0.017	0.002
232	19.33	0.13	0.026	(0.207)	0.023	0.003
233	19.42	0.13	0.026	(0.206)	0.023	0.003
234	19.50	0.13	0.026	(0.205)	0.023	0.003
235	19.58	0.10	0.019	(0.204)	0.017	0.002
236	19.67	0.10	0.019	(0.203)	0.017	0.002
237	19.75	0.10	0.019	(0.202)	0.017	0.002
238	19.83	0.07	0.013	(0.201)	0.012	0.001
239	19.92	0.07	0.013	(0.200)	0.012	0.001
240	20.00	0.07	0.013	(0.199)	0.012	0.001
241	20.08	0.10	0.019	(0.198)	0.017	0.002
242	20.17	0.10	0.019	(0.197)	0.017	0.002
243	20.25	0.10	0.019	(0.197)	0.017	0.002
244	20.33	0.10	0.019	(0.196)	0.017	0.002
245	20.42	0.10	0.019	(0.195)	0.017	0.002
246	20.50	0.10	0.019	(0.194)	0.017	0.002
247	20.58	0.10	0.019	(0.193)	0.017	0.002
248	20.67	0.10	0.019	(0.192)	0.017	0.002
249	20.75	0.10	0.019	(0.192)	0.017	0.002
250	20.83	0.07	0.013	(0.191)	0.012	0.001
251	20.92	0.07	0.013	(0.190)	0.012	0.001
252	21.00	0.07	0.013	(0.189)	0.012	0.001
253	21.08	0.10	0.019	(0.189)	0.017	0.002
254	21.17	0.10	0.019	(0.188)	0.017	0.002
255	21.25	0.10	0.019	(0.187)	0.017	0.002
256	21.33	0.07	0.013	(0.186)	0.012	0.001
257	21.42	0.07	0.013	(0.186)	0.012	0.001
258	21.50	0.07	0.013	(0.185)	0.012	0.001
259	21.58	0.10	0.019	(0.184)	0.017	0.002
260	21.67	0.10	0.019	(0.184)	0.017	0.002
261	21.75	0.10	0.019	(0.183)	0.017	0.002
262	21.83	0.07	0.013	(0.182)	0.012	0.001
263	21.92	0.07	0.013	(0.182)	0.012	0.001
264	22.00	0.07	0.013	(0.181)	0.012	0.001
265	22.08	0.10	0.019	(0.181)	0.017	0.002
266	22.17	0.10	0.019	(0.180)	0.017	0.002
267	22.25	0.10	0.019	(0.179)	0.017	0.002
268	22.33	0.07	0.013	(0.179)	0.012	0.001
269	22.42	0.07	0.013	(0.178)	0.012	0.001
270	22.50	0.07	0.013	(0.178)	0.012	0.001
271	22.58	0.07	0.013	(0.177)	0.012	0.001
272	22.67	0.07	0.013	(0.177)	0.012	0.001
273	22.75	0.07	0.013	(0.176)	0.012	0.001
274	22.83	0.07	0.013	(0.176)	0.012	0.001
275	22.92	0.07	0.013	(0.175)	0.012	0.001
276	23.00	0.07	0.013	(0.175)	0.012	0.001
277	23.08	0.07	0.013	(0.175)	0.012	0.001
278	23.17	0.07	0.013	(0.174)	0.012	0.001
279	23.25	0.07	0.013	(0.174)	0.012	0.001
280	23.33	0.07	0.013	(0.173)	0.012	0.001

281	23.42	0.07	0.013	(0.173)	0.012	0.001
282	23.50	0.07	0.013	(0.173)	0.012	0.001
283	23.58	0.07	0.013	(0.173)	0.012	0.001
284	23.67	0.07	0.013	(0.172)	0.012	0.001
285	23.75	0.07	0.013	(0.172)	0.012	0.001
286	23.83	0.07	0.013	(0.172)	0.012	0.001
287	23.92	0.07	0.013	(0.172)	0.012	0.001
288	24.00	0.07	0.013	(0.172)	0.012	0.001

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.9

Flood volume = Effective rainfall 0.16(In)
times area 28.8(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)
Total soil loss = 1.44(In)
Total soil loss = 3.456(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 16726.1 Cubic Feet
Total soil loss = 150534.9 Cubic Feet

Peak flow rate of this hydrograph = 0.628(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q	|	|	|	|
0+10	0.0002	0.02	Q	|	|	|	|
0+15	0.0004	0.03	Q	|	|	|	|
0+20	0.0007	0.04	Q	|	|	|	|
0+25	0.0010	0.05	Q	|	|	|	|
0+30	0.0013	0.05	Q	|	|	|	|
0+35	0.0017	0.05	Q	|	|	|	|
0+40	0.0021	0.05	Q	|	|	|	|
0+45	0.0024	0.05	Q	|	|	|	|
0+50	0.0028	0.06	Q	|	|	|	|
0+55	0.0033	0.07	Q	|	|	|	|
1+ 0	0.0038	0.07	Q	|	|	|	|
1+ 5	0.0043	0.07	Q	|	|	|	|
1+10	0.0047	0.06	Q	|	|	|	|
1+15	0.0051	0.06	Q	|	|	|	|
1+20	0.0055	0.06	Q	|	|	|	|
1+25	0.0059	0.06	Q	|	|	|	|
1+30	0.0063	0.06	Q	|	|	|	|
1+35	0.0067	0.06	Q	|	|	|	|
1+40	0.0070	0.06	Q	|	|	|	|
1+45	0.0074	0.06	Q	|	|	|	|
1+50	0.0078	0.06	Q	|	|	|	|
1+55	0.0083	0.07	Q	|	|	|	|
2+ 0	0.0088	0.07	Q	|	|	|	|
2+ 5	0.0093	0.07	Q	|	|	|	|
2+10	0.0098	0.07	QV	|	|	|	|
2+15	0.0103	0.07	QV	|	|	|	|

```
2+20       0.0108      0.07  QV        |         |         |
2+25       0.0113      0.07  QV        |         |         |
2+30       0.0118      0.07  QV        |         |         |
2+35       0.0124      0.08  QV        |         |         |
2+40       0.0129      0.09  QV        |         |         |
2+45       0.0136      0.09  QV        |         |         |
2+50       0.0142      0.09  QV        |         |         |
2+55       0.0148      0.09  QV        |         |         |
3+ 0       0.0155      0.09  QV        |         |         |
3+ 5       0.0161      0.09  QV        |         |         |
3+10       0.0167      0.09  QV        |         |         |
3+15       0.0174      0.09  QV        |         |         |
3+20       0.0180      0.09  QV        |         |         |
3+25       0.0186      0.09  QV        |         |         |
3+30       0.0193      0.09  Q V       |         |         |
3+35       0.0199      0.09  Q V       |         |         |
3+40       0.0206      0.09  Q V       |         |         |
3+45       0.0212      0.09  Q V       |         |         |
3+50       0.0219      0.10  Q V       |         |         |
3+55       0.0226      0.10  Q V       |         |         |
4+ 0       0.0233      0.11  Q V       |         |         |
4+ 5       0.0241      0.11  Q V       |         |         |
4+10       0.0248      0.11  Q V       |         |         |
4+15       0.0256      0.11  Q V       |         |         |
4+20       0.0264      0.11  Q V       |         |         |
4+25       0.0272      0.12  Q V       |         |         |
4+30       0.0281      0.13  Q V       |         |         |
4+35       0.0290      0.13  Q  V      |         |         |
4+40       0.0299      0.13  Q  V      |         |         |
4+45       0.0308      0.13  Q  V      |         |         |
4+50       0.0317      0.13  Q  V      |         |         |
4+55       0.0327      0.14  Q  V      |         |         |
5+ 0       0.0337      0.15  Q  V      |         |         |
5+ 5       0.0346      0.14  Q  V      |         |         |
5+10       0.0355      0.12  Q  V      |         |         |
5+15       0.0363      0.12  Q  V      |         |         |
5+20       0.0371      0.12  Q  V      |         |         |
5+25       0.0380      0.13  Q  V      |         |         |
5+30       0.0389      0.13  Q   V     |         |         |
5+35       0.0398      0.13  Q   V     |         |         |
5+40       0.0407      0.14  Q   V     |         |         |
5+45       0.0417      0.14  Q   V     |         |         |
5+50       0.0427      0.15  Q   V     |         |         |
5+55       0.0437      0.15  Q   V     |         |         |
6+ 0       0.0448      0.15  Q   V     |         |         |
6+ 5       0.0458      0.15  Q   V     |         |         |
6+10       0.0469      0.16  Q   V     |         |         |
6+15       0.0480      0.16  Q    V    |         |         |
6+20       0.0492      0.17  Q    V    |         |         |
6+25       0.0503      0.17  Q    V    |         |         |
6+30       0.0515      0.17  Q    V    |         |         |
6+35       0.0526      0.17  Q    V    |         |         |
6+40       0.0539      0.18  Q    V    |         |         |
6+45       0.0551      0.18  Q    V    |         |         |
6+50       0.0564      0.18  Q    V    |         |         |
6+55       0.0577      0.18  Q     V   |         |         |
```



```
7+ 0       0.0589      0.19  Q     V   |         |         |
7+ 5       0.0602      0.19  Q     V   |         |         |
7+10       0.0615      0.19  Q     V   |         |         |
7+15       0.0628      0.19  Q     V   |         |         |
7+20       0.0641      0.19  Q     V   |         |         |
7+25       0.0654      0.20  Q     V   |         |         |
7+30       0.0668      0.20  Q     V   |         |         |
7+35       0.0682      0.21  Q      V  |         |         |
7+40       0.0697      0.21  Q      V  |         |         |
7+45       0.0712      0.22  Q      V  |         |         |
7+50       0.0728      0.22  Q      V  |         |         |
7+55       0.0744      0.23  Q      V  |         |         |
8+ 0       0.0760      0.24  Q      V  |         |         |
8+ 5       0.0777      0.25  Q       V |         |         |
8+10       0.0795      0.26  |Q      V |         |         |
8+15       0.0814      0.27  |Q      V |         |         |
8+20       0.0832      0.27  |Q      V |         |         |
8+25       0.0851      0.28  |Q      V |         |         |
8+30       0.0871      0.28  |Q       V|         |         |
8+35       0.0890      0.28  |Q       V|         |         |
8+40       0.0910      0.29  |Q       V|         |         |
8+45       0.0930      0.29  |Q       V|         |         |
8+50       0.0951      0.30  |Q       V|         |         |
8+55       0.0972      0.31  |Q        V         |         |
9+ 0       0.0993      0.31  |Q        V         |         |
9+ 5       0.1015      0.32  |Q        V         |         |
9+10       0.1039      0.34  |Q        V         |         |
9+15       0.1062      0.35  |Q        |V        |         |
9+20       0.1087      0.35  |Q        |V        |         |
9+25       0.1112      0.36  |Q        |V        |         |
9+30       0.1137      0.37  |Q        |V        |         |
9+35       0.1162      0.37  |Q        | V       |         |
9+40       0.1189      0.38  |Q        | V       |         |
9+45       0.1215      0.39  |Q        | V       |         |
9+50       0.1242      0.39  |Q        | V       |         |
9+55       0.1270      0.40  |Q        |  V      |         |
10+ 0      0.1298      0.40  |Q        |  V      |         |
10+ 5      0.1324      0.38  |Q        |  V      |         |
10+10      0.1346      0.32  |Q        |   V     |         |
10+15      0.1367      0.30  |Q        |   V     |         |
10+20      0.1388      0.29  |Q        |   V     |         |
10+25      0.1407      0.29  |Q        |   V     |         |
10+30      0.1427      0.28  |Q        |   V     |         |
10+35      0.1447      0.30  |Q        |    V    |         |
10+40      0.1471      0.34  |Q        |    V    |         |
10+45      0.1495      0.35  |Q        |    V    |         |
10+50      0.1520      0.36  |Q        |    V    |         |
10+55      0.1545      0.37  |Q        |     V   |         |
11+ 0      0.1570      0.37  |Q        |     V   |         |
11+ 5      0.1596      0.37  |Q        |     V   |         |
11+10      0.1620      0.36  |Q        |     V   |         |
11+15      0.1645      0.36  |Q        |      V  |         |
11+20      0.1669      0.36  |Q        |      V  |         |
11+25      0.1694      0.35  |Q        |      V  |         |
11+30      0.1718      0.35  |Q        |      V  |         |
11+35      0.1742      0.35  |Q        |       V |         |
```

```
11+40      0.1765      0.33  |Q        |       V |         |         |
11+45      0.1787      0.32  |Q        |       V |         |         |
11+50      0.1809      0.32  |Q        |       V |         |         |
11+55      0.1832      0.33  |Q        |        V|         |         |
12+ 0      0.1855      0.33  |Q        |        V|         |         |
12+ 5      0.1879      0.35  |Q        |        V|         |         |
12+10      0.1908      0.42  |Q        |        V|         |         |
12+15      0.1938      0.44  |Q        |         V         |         |
12+20      0.1969      0.45  |Q        |         V         |         |
12+25      0.2002      0.47  |Q        |         V         |         |
12+30      0.2034      0.47  |Q        |         |V        |         |
12+35      0.2068      0.48  |Q        |         |V        |         |
12+40      0.2102      0.50  | Q       |         |V        |         |
12+45      0.2138      0.51  | Q       |         | V       |         |
12+50      0.2173      0.52  | Q       |         | V       |         |
12+55      0.2210      0.53  | Q       |         |  V      |         |
13+ 0      0.2247      0.53  | Q       |         |  V      |         |
13+ 5      0.2285      0.55  | Q       |         |  V      |         |
13+10      0.2326      0.60  | Q       |         |   V     |         |
13+15      0.2368      0.61  | Q       |         |   V     |         |
13+20      0.2411      0.62  | Q       |         |    V    |         |
13+25      0.2454      0.63  | Q       |         |    V    |         |
13+30      0.2497      0.63  | Q       |         |     V   |         |
13+35      0.2538      0.60  | Q       |         |     V   |         |
13+40      0.2572      0.50  | Q       |         |     V   |         |
13+45      0.2605      0.47  |Q        |         |      V  |         |
13+50      0.2636      0.45  |Q        |         |      V  |         |
13+55      0.2666      0.44  |Q        |         |      V  |         |
14+ 0      0.2696      0.44  |Q        |         |       V |         |
14+ 5      0.2727      0.44  |Q        |         |       V |         |
14+10      0.2760      0.48  |Q        |         |       V |         |
14+15      0.2793      0.49  |Q        |         |        V|         |
14+20      0.2827      0.49  |Q        |         |        V|         |
14+25      0.2860      0.48  |Q        |         |        V|         |
14+30      0.2894      0.48  |Q        |         |         V         |
14+35      0.2927      0.48  |Q        |         |         V         |
14+40      0.2960      0.48  |Q        |         |         V         |
14+45      0.2994      0.48  |Q        |         |         |V        |
14+50      0.3027      0.48  |Q        |         |         |V        |
14+55      0.3059      0.47  |Q        |         |         |V        |
15+ 0      0.3091      0.47  |Q        |         |         | V       |
15+ 5      0.3123      0.46  |Q        |         |         | V       |
15+10      0.3155      0.45  |Q        |         |         | V       |
15+15      0.3186      0.45  |Q        |         |         |  V      |
15+20      0.3216      0.45  |Q        |         |         |  V      |
15+25      0.3246      0.44  |Q        |         |         |  V      |
15+30      0.3276      0.43  |Q        |         |         |   V     |
15+35      0.3305      0.42  |Q        |         |         |   V     |
15+40      0.3331      0.38  |Q        |         |         |   V     |
15+45      0.3356      0.37  |Q        |         |         |   V     |
15+50      0.3381      0.36  |Q        |         |         |    V    |
15+55      0.3406      0.36  |Q        |         |         |    V    |
16+ 0      0.3431      0.36  |Q        |         |         |    V    |
16+ 5      0.3452      0.31  |Q        |         |         |    V    |
16+10      0.3464      0.18  Q         |         |         |     V   |
16+15      0.3473      0.13  Q         |         |         |     V   |
```



```
16+20      0.3480      0.11  Q         |         |         |     V   |
16+25      0.3487      0.09  Q         |         |         |     V   |
16+30      0.3493      0.09  Q         |         |         |     V   |
16+35      0.3498      0.08  Q         |         |         |     V   |
16+40      0.3503      0.07  Q         |         |         |     V   |
16+45      0.3507      0.06  Q         |         |         |     V   |
16+50      0.3511      0.06  Q         |         |         |     V   |
16+55      0.3515      0.06  Q         |         |         |     V   |
17+ 0      0.3519      0.06  Q         |         |         |     V   |
17+ 5      0.3523      0.06  Q         |         |         |     V   |
17+10      0.3528      0.08  Q         |         |         |     V   |
17+15      0.3534      0.09  Q         |         |         |     V   |
17+20      0.3540      0.09  Q         |         |         |     V   |
17+25      0.3547      0.09  Q         |         |         |     V   |
17+30      0.3553      0.09  Q         |         |         |      V  |
17+35      0.3559      0.09  Q         |         |         |      V  |
17+40      0.3565      0.09  Q         |         |         |      V  |
17+45      0.3572      0.09  Q         |         |         |      V  |
17+50      0.3578      0.09  Q         |         |         |      V  |
17+55      0.3584      0.08  Q         |         |         |      V  |
18+ 0      0.3589      0.08  Q         |         |         |      V  |
18+ 5      0.3594      0.08  Q         |         |         |      V  |
18+10      0.3600      0.08  Q         |         |         |      V  |
18+15      0.3605      0.08  Q         |         |         |      V  |
18+20      0.3610      0.07  Q         |         |         |      V  |
18+25      0.3615      0.07  Q         |         |         |      V  |
18+30      0.3620      0.07  Q         |         |         |      V  |
18+35      0.3625      0.07  Q         |         |         |      V  |
18+40      0.3629      0.06  Q         |         |         |      V  |
18+45      0.3633      0.06  Q         |         |         |      V  |
18+50      0.3637      0.05  Q         |         |         |      V  |
18+55      0.3640      0.05  Q         |         |         |      V  |
19+ 0      0.3643      0.04  Q         |         |         |      V  |
19+ 5      0.3646      0.04  Q         |         |         |      V  |
19+10      0.3650      0.05  Q         |         |         |       V |
19+15      0.3653      0.05  Q         |         |         |       V |
19+20      0.3657      0.06  Q         |         |         |       V |
19+25      0.3662      0.07  Q         |         |         |       V |
19+30      0.3667      0.07  Q         |         |         |       V |
19+35      0.3671      0.07  Q         |         |         |       V |
19+40      0.3675      0.06  Q         |         |         |       V |
19+45      0.3680      0.06  Q         |         |         |       V |
19+50      0.3683      0.05  Q         |         |         |       V |
19+55      0.3686      0.05  Q         |         |         |       V |
20+ 0      0.3689      0.04  Q         |         |         |       V |
20+ 5      0.3692      0.04  Q         |         |         |       V |
20+10      0.3696      0.05  Q         |         |         |       V |
20+15      0.3699      0.05  Q         |         |         |       V |
20+20      0.3703      0.05  Q         |         |         |       V |
20+25      0.3707      0.05  Q         |         |         |       V |
20+30      0.3711      0.05  Q         |         |         |       V |
20+35      0.3714      0.06  Q         |         |         |       V |
20+40      0.3718      0.06  Q         |         |         |       V |
20+45      0.3722      0.06  Q         |         |         |       V |
20+50      0.3726      0.05  Q         |         |         |       V |
20+55      0.3729      0.04  Q         |         |         |       V |
```

```
   21+ 0       0.3732      0.04  Q         |         |         |       V |
   21+ 5       0.3734      0.04  Q         |         |         |       V |
   21+10       0.3738      0.05  Q         |         |         |       V |
   21+15       0.3742      0.05  Q         |         |         |       V |
   21+20       0.3745      0.05  Q         |         |         |        V|
   21+25       0.3748      0.04  Q         |         |         |        V|
   21+30       0.3751      0.04  Q         |         |         |        V|
   21+35       0.3754      0.04  Q         |         |         |        V|
   21+40       0.3757      0.05  Q         |         |         |        V|
   21+45       0.3761      0.05  Q         |         |         |        V|
   21+50       0.3764      0.05  Q         |         |         |        V|
   21+55       0.3767      0.04  Q         |         |         |        V|
   22+ 0       0.3770      0.04  Q         |         |         |        V|
   22+ 5       0.3773      0.04  Q         |         |         |        V|
   22+10       0.3776      0.05  Q         |         |         |        V|
   22+15       0.3780      0.05  Q         |         |         |        V|
   22+20       0.3783      0.05  Q         |         |         |        V|
   22+25       0.3786      0.04  Q         |         |         |        V|
   22+30       0.3789      0.04  Q         |         |         |        V|
   22+35       0.3792      0.04  Q         |         |         |        V|
   22+40       0.3794      0.04  Q         |         |         |        V|
   22+45       0.3797      0.04  Q         |         |         |        V|
   22+50       0.3800      0.04  Q         |         |         |        V|
   22+55       0.3802      0.04  Q         |         |         |        V|
   23+ 0       0.3805      0.04  Q         |         |         |        V|
   23+ 5       0.3807      0.04  Q         |         |         |        V|
   23+10       0.3810      0.04  Q         |         |         |        V|
   23+15       0.3812      0.04  Q         |         |         |        V|
   23+20       0.3815      0.04  Q         |         |         |        V|
   23+25       0.3818      0.04  Q         |         |         |        V|
   23+30       0.3820      0.04  Q         |         |         |        V|
   23+35       0.3823      0.04  Q         |         |         |        V|
   23+40       0.3825      0.04  Q         |         |         |        V|
   23+45       0.3828      0.04  Q         |         |         |        V|
   23+50       0.3830      0.04  Q         |         |         |        V|
   23+55       0.3833      0.04  Q         |         |         |        V|
   24+ 0       0.3836      0.04  Q         |         |         |        V|
   24+ 5       0.3838      0.03  Q         |         |         |        V|
   24+10       0.3839      0.01  Q         |         |         |        V|
   24+15       0.3839      0.01  Q         |         |         |        V|
   24+20       0.3839      0.00  Q         |         |         |        V|
   24+25       0.3840      0.00  Q         |         |         |        V|
   24+30       0.3840      0.00  Q         |         |         |        V|
   24+35       0.3840      0.00  Q         |         |         |        V|
   24+40       0.3840      0.00  Q         |         |         |        V|
-----------------------------------------------------------------------
```

Unit Hydrographs 2 Year, 24 Hour, Post-Project for Walmart Site

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/12/12 File: postcond242.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

-------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



-------------------------------------------------------------------------
2 Year, 24 Hour Storm Event
Walmart Site
HCOC Analysis - Post-Project

----------------------------------------------------------------------
Drainage Area =      21.70(Ac.)  =      0.034 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      21.70(Ac.)  =
0.034 Sq. Mi.
Length along longest watercourse =    1530.00(Ft.)
Length along longest watercourse measured to centroid =     770.00(Ft.)
Length along longest watercourse =      0.290 Mi.
Length along longest watercourse measured to centroid =      0.146 Mi.
Difference in elevation =      10.00(Ft.)
Slope along watercourse =     34.5098 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.055 Hr.
Lag time =     3.31 Min.
25% of lag time =     0.83 Min.
40% of lag time =     1.32 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             1.60                 34.72

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             4.00                 86.80

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    21.700           56.00         0.900
 Total Area Entered =     21.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  36.0      0.706     0.900        0.134       1.000      0.134
                                                    Sum (F) =   0.134
Area averaged mean soil loss (F) (In/Hr) =  0.134
Minimum soil loss rate ((In/Hr)) =  0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.180
-----------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
-----------------------------------------------------------------------
           Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.083        150.966         33.408              7.306
    2   0.167        301.931         46.939             10.265
    3   0.250        452.897         11.125              2.433
    4   0.333        603.862          4.854              1.062
    5   0.417        754.828          2.438              0.533
    6   0.500        905.793          1.235              0.270
                                Sum = 100.000   Sum=      21.870
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     0.07      0.013       (  0.238)       0.002        0.010
   2   0.17     0.07      0.013       (  0.237)       0.002        0.010
   3   0.25     0.07      0.013       (  0.236)       0.002        0.010
```

4	0.33	0.10	0.019	(0.235)	0.003	0.016
5	0.42	0.10	0.019	(0.234)	0.003	0.016
6	0.50	0.10	0.019	(0.233)	0.003	0.016
7	0.58	0.10	0.019	(0.232)	0.003	0.016
8	0.67	0.10	0.019	(0.231)	0.003	0.016
9	0.75	0.10	0.019	(0.230)	0.003	0.016
10	0.83	0.13	0.026	(0.230)	0.005	0.021
11	0.92	0.13	0.026	(0.229)	0.005	0.021
12	1.00	0.13	0.026	(0.228)	0.005	0.021
13	1.08	0.10	0.019	(0.227)	0.003	0.016
14	1.17	0.10	0.019	(0.226)	0.003	0.016
15	1.25	0.10	0.019	(0.225)	0.003	0.016
16	1.33	0.10	0.019	(0.224)	0.003	0.016
17	1.42	0.10	0.019	(0.223)	0.003	0.016
18	1.50	0.10	0.019	(0.222)	0.003	0.016
19	1.58	0.10	0.019	(0.222)	0.003	0.016
20	1.67	0.10	0.019	(0.221)	0.003	0.016
21	1.75	0.10	0.019	(0.220)	0.003	0.016
22	1.83	0.13	0.026	(0.219)	0.005	0.021
23	1.92	0.13	0.026	(0.218)	0.005	0.021
24	2.00	0.13	0.026	(0.217)	0.005	0.021
25	2.08	0.13	0.026	(0.216)	0.005	0.021
26	2.17	0.13	0.026	(0.215)	0.005	0.021
27	2.25	0.13	0.026	(0.214)	0.005	0.021
28	2.33	0.13	0.026	(0.214)	0.005	0.021
29	2.42	0.13	0.026	(0.213)	0.005	0.021
30	2.50	0.13	0.026	(0.212)	0.005	0.021
31	2.58	0.17	0.032	(0.211)	0.006	0.026
32	2.67	0.17	0.032	(0.210)	0.006	0.026
33	2.75	0.17	0.032	(0.209)	0.006	0.026
34	2.83	0.17	0.032	(0.208)	0.006	0.026
35	2.92	0.17	0.032	(0.208)	0.006	0.026
36	3.00	0.17	0.032	(0.207)	0.006	0.026
37	3.08	0.17	0.032	(0.206)	0.006	0.026
38	3.17	0.17	0.032	(0.205)	0.006	0.026
39	3.25	0.17	0.032	(0.204)	0.006	0.026
40	3.33	0.17	0.032	(0.203)	0.006	0.026
41	3.42	0.17	0.032	(0.202)	0.006	0.026
42	3.50	0.17	0.032	(0.202)	0.006	0.026
43	3.58	0.17	0.032	(0.201)	0.006	0.026
44	3.67	0.17	0.032	(0.200)	0.006	0.026
45	3.75	0.17	0.032	(0.199)	0.006	0.026
46	3.83	0.20	0.038	(0.198)	0.007	0.031
47	3.92	0.20	0.038	(0.197)	0.007	0.031
48	4.00	0.20	0.038	(0.197)	0.007	0.031
49	4.08	0.20	0.038	(0.196)	0.007	0.031
50	4.17	0.20	0.038	(0.195)	0.007	0.031
51	4.25	0.20	0.038	(0.194)	0.007	0.031
52	4.33	0.23	0.045	(0.193)	0.008	0.037
53	4.42	0.23	0.045	(0.192)	0.008	0.037
54	4.50	0.23	0.045	(0.192)	0.008	0.037
55	4.58	0.23	0.045	(0.191)	0.008	0.037
56	4.67	0.23	0.045	(0.190)	0.008	0.037
57	4.75	0.23	0.045	(0.189)	0.008	0.037
58	4.83	0.27	0.051	(0.188)	0.009	0.042
59	4.92	0.27	0.051	(0.187)	0.009	0.042

60	5.00	0.27	0.051	(0.187)	0.009	0.042
61	5.08	0.20	0.038	(0.186)	0.007	0.031
62	5.17	0.20	0.038	(0.185)	0.007	0.031
63	5.25	0.20	0.038	(0.184)	0.007	0.031
64	5.33	0.23	0.045	(0.183)	0.008	0.037
65	5.42	0.23	0.045	(0.183)	0.008	0.037
66	5.50	0.23	0.045	(0.182)	0.008	0.037
67	5.58	0.27	0.051	(0.181)	0.009	0.042
68	5.67	0.27	0.051	(0.180)	0.009	0.042
69	5.75	0.27	0.051	(0.179)	0.009	0.042
70	5.83	0.27	0.051	(0.179)	0.009	0.042
71	5.92	0.27	0.051	(0.178)	0.009	0.042
72	6.00	0.27	0.051	(0.177)	0.009	0.042
73	6.08	0.30	0.058	(0.176)	0.010	0.047
74	6.17	0.30	0.058	(0.175)	0.010	0.047
75	6.25	0.30	0.058	(0.175)	0.010	0.047
76	6.33	0.30	0.058	(0.174)	0.010	0.047
77	6.42	0.30	0.058	(0.173)	0.010	0.047
78	6.50	0.30	0.058	(0.172)	0.010	0.047
79	6.58	0.33	0.064	(0.172)	0.012	0.052
80	6.67	0.33	0.064	(0.171)	0.012	0.052
81	6.75	0.33	0.064	(0.170)	0.012	0.052
82	6.83	0.33	0.064	(0.169)	0.012	0.052
83	6.92	0.33	0.064	(0.169)	0.012	0.052
84	7.00	0.33	0.064	(0.168)	0.012	0.052
85	7.08	0.33	0.064	(0.167)	0.012	0.052
86	7.17	0.33	0.064	(0.166)	0.012	0.052
87	7.25	0.33	0.064	(0.165)	0.012	0.052
88	7.33	0.37	0.070	(0.165)	0.013	0.058
89	7.42	0.37	0.070	(0.164)	0.013	0.058
90	7.50	0.37	0.070	(0.163)	0.013	0.058
91	7.58	0.40	0.077	(0.162)	0.014	0.063
92	7.67	0.40	0.077	(0.162)	0.014	0.063
93	7.75	0.40	0.077	(0.161)	0.014	0.063
94	7.83	0.43	0.083	(0.160)	0.015	0.068
95	7.92	0.43	0.083	(0.159)	0.015	0.068
96	8.00	0.43	0.083	(0.159)	0.015	0.068
97	8.08	0.50	0.096	(0.158)	0.017	0.079
98	8.17	0.50	0.096	(0.157)	0.017	0.079
99	8.25	0.50	0.096	(0.157)	0.017	0.079
100	8.33	0.50	0.096	(0.156)	0.017	0.079
101	8.42	0.50	0.096	(0.155)	0.017	0.079
102	8.50	0.50	0.096	(0.154)	0.017	0.079
103	8.58	0.53	0.102	(0.154)	0.018	0.084
104	8.67	0.53	0.102	(0.153)	0.018	0.084
105	8.75	0.53	0.102	(0.152)	0.018	0.084
106	8.83	0.57	0.109	(0.151)	0.020	0.089
107	8.92	0.57	0.109	(0.151)	0.020	0.089
108	9.00	0.57	0.109	(0.150)	0.020	0.089
109	9.08	0.63	0.122	(0.149)	0.022	0.100
110	9.17	0.63	0.122	(0.149)	0.022	0.100
111	9.25	0.63	0.122	(0.148)	0.022	0.100
112	9.33	0.67	0.128	(0.147)	0.023	0.105
113	9.42	0.67	0.128	(0.147)	0.023	0.105
114	9.50	0.67	0.128	(0.146)	0.023	0.105
115	9.58	0.70	0.134	(0.145)	0.024	0.110

116	9.67	0.70	0.134	(0.144)	0.024	0.110
117	9.75	0.70	0.134	(0.144)	0.024	0.110
118	9.83	0.73	0.141	(0.143)	0.025	0.115
119	9.92	0.73	0.141	(0.142)	0.025	0.115
120	10.00	0.73	0.141	(0.142)	0.025	0.115
121	10.08	0.50	0.096	(0.141)	0.017	0.079
122	10.17	0.50	0.096	(0.140)	0.017	0.079
123	10.25	0.50	0.096	(0.140)	0.017	0.079
124	10.33	0.50	0.096	(0.139)	0.017	0.079
125	10.42	0.50	0.096	(0.138)	0.017	0.079
126	10.50	0.50	0.096	(0.138)	0.017	0.079
127	10.58	0.67	0.128	(0.137)	0.023	0.105
128	10.67	0.67	0.128	(0.136)	0.023	0.105
129	10.75	0.67	0.128	(0.136)	0.023	0.105
130	10.83	0.67	0.128	(0.135)	0.023	0.105
131	10.92	0.67	0.128	(0.134)	0.023	0.105
132	11.00	0.67	0.128	(0.134)	0.023	0.105
133	11.08	0.63	0.122	(0.133)	0.022	0.100
134	11.17	0.63	0.122	(0.132)	0.022	0.100
135	11.25	0.63	0.122	(0.132)	0.022	0.100
136	11.33	0.63	0.122	(0.131)	0.022	0.100
137	11.42	0.63	0.122	(0.130)	0.022	0.100
138	11.50	0.63	0.122	(0.130)	0.022	0.100
139	11.58	0.57	0.109	(0.129)	0.020	0.089
140	11.67	0.57	0.109	(0.128)	0.020	0.089
141	11.75	0.57	0.109	(0.128)	0.020	0.089
142	11.83	0.60	0.115	(0.127)	0.021	0.094
143	11.92	0.60	0.115	(0.126)	0.021	0.094
144	12.00	0.60	0.115	(0.126)	0.021	0.094
145	12.08	0.83	0.160	(0.125)	0.029	0.131
146	12.17	0.83	0.160	(0.125)	0.029	0.131
147	12.25	0.83	0.160	(0.124)	0.029	0.131
148	12.33	0.87	0.166	(0.123)	0.030	0.136
149	12.42	0.87	0.166	(0.123)	0.030	0.136
150	12.50	0.87	0.166	(0.122)	0.030	0.136
151	12.58	0.93	0.179	(0.121)	0.032	0.147
152	12.67	0.93	0.179	(0.121)	0.032	0.147
153	12.75	0.93	0.179	(0.120)	0.032	0.147
154	12.83	0.97	0.186	(0.120)	0.033	0.152
155	12.92	0.97	0.186	(0.119)	0.033	0.152
156	13.00	0.97	0.186	(0.118)	0.033	0.152
157	13.08	1.13	0.218	(0.118)	0.039	0.178
158	13.17	1.13	0.218	(0.117)	0.039	0.178
159	13.25	1.13	0.218	(0.117)	0.039	0.178
160	13.33	1.13	0.218	(0.116)	0.039	0.178
161	13.42	1.13	0.218	(0.115)	0.039	0.178
162	13.50	1.13	0.218	(0.115)	0.039	0.178
163	13.58	0.77	0.147	(0.114)	0.026	0.121
164	13.67	0.77	0.147	(0.114)	0.026	0.121
165	13.75	0.77	0.147	(0.113)	0.026	0.121
166	13.83	0.77	0.147	(0.113)	0.026	0.121
167	13.92	0.77	0.147	(0.112)	0.026	0.121
168	14.00	0.77	0.147	(0.111)	0.026	0.121
169	14.08	0.90	0.173	(0.111)	0.031	0.142
170	14.17	0.90	0.173	(0.110)	0.031	0.142
171	14.25	0.90	0.173	(0.110)	0.031	0.142

172	14.33	0.87	0.166	(0.109)	0.030	0.136
173	14.42	0.87	0.166	(0.109)	0.030	0.136
174	14.50	0.87	0.166	(0.108)	0.030	0.136
175	14.58	0.87	0.166	(0.107)	0.030	0.136
176	14.67	0.87	0.166	(0.107)	0.030	0.136
177	14.75	0.87	0.166	(0.106)	0.030	0.136
178	14.83	0.83	0.160	(0.106)	0.029	0.131
179	14.92	0.83	0.160	(0.105)	0.029	0.131
180	15.00	0.83	0.160	(0.105)	0.029	0.131
181	15.08	0.80	0.154	(0.104)	0.028	0.126
182	15.17	0.80	0.154	(0.104)	0.028	0.126
183	15.25	0.80	0.154	(0.103)	0.028	0.126
184	15.33	0.77	0.147	(0.103)	0.026	0.121
185	15.42	0.77	0.147	(0.102)	0.026	0.121
186	15.50	0.77	0.147	(0.102)	0.026	0.121
187	15.58	0.63	0.122	(0.101)	0.022	0.100
188	15.67	0.63	0.122	(0.101)	0.022	0.100
189	15.75	0.63	0.122	(0.100)	0.022	0.100
190	15.83	0.63	0.122	(0.100)	0.022	0.100
191	15.92	0.63	0.122	(0.099)	0.022	0.100
192	16.00	0.63	0.122	(0.099)	0.022	0.100
193	16.08	0.13	0.026	(0.098)	0.005	0.021
194	16.17	0.13	0.026	(0.098)	0.005	0.021
195	16.25	0.13	0.026	(0.097)	0.005	0.021
196	16.33	0.13	0.026	(0.097)	0.005	0.021
197	16.42	0.13	0.026	(0.096)	0.005	0.021
198	16.50	0.13	0.026	(0.096)	0.005	0.021
199	16.58	0.10	0.019	(0.095)	0.003	0.016
200	16.67	0.10	0.019	(0.095)	0.003	0.016
201	16.75	0.10	0.019	(0.094)	0.003	0.016
202	16.83	0.10	0.019	(0.094)	0.003	0.016
203	16.92	0.10	0.019	(0.093)	0.003	0.016
204	17.00	0.10	0.019	(0.093)	0.003	0.016
205	17.08	0.17	0.032	(0.092)	0.006	0.026
206	17.17	0.17	0.032	(0.092)	0.006	0.026
207	17.25	0.17	0.032	(0.091)	0.006	0.026
208	17.33	0.17	0.032	(0.091)	0.006	0.026
209	17.42	0.17	0.032	(0.090)	0.006	0.026
210	17.50	0.17	0.032	(0.090)	0.006	0.026
211	17.58	0.17	0.032	(0.089)	0.006	0.026
212	17.67	0.17	0.032	(0.089)	0.006	0.026
213	17.75	0.17	0.032	(0.089)	0.006	0.026
214	17.83	0.13	0.026	(0.088)	0.005	0.021
215	17.92	0.13	0.026	(0.088)	0.005	0.021
216	18.00	0.13	0.026	(0.087)	0.005	0.021
217	18.08	0.13	0.026	(0.087)	0.005	0.021
218	18.17	0.13	0.026	(0.086)	0.005	0.021
219	18.25	0.13	0.026	(0.086)	0.005	0.021
220	18.33	0.13	0.026	(0.086)	0.005	0.021
221	18.42	0.13	0.026	(0.085)	0.005	0.021
222	18.50	0.13	0.026	(0.085)	0.005	0.021
223	18.58	0.10	0.019	(0.084)	0.003	0.016
224	18.67	0.10	0.019	(0.084)	0.003	0.016
225	18.75	0.10	0.019	(0.084)	0.003	0.016
226	18.83	0.07	0.013	(0.083)	0.002	0.010
227	18.92	0.07	0.013	(0.083)	0.002	0.010

228	19.00	0.07	0.013	(0.082)	0.002	0.010
229	19.08	0.10	0.019	(0.082)	0.003	0.016
230	19.17	0.10	0.019	(0.082)	0.003	0.016
231	19.25	0.10	0.019	(0.081)	0.003	0.016
232	19.33	0.13	0.026	(0.081)	0.005	0.021
233	19.42	0.13	0.026	(0.080)	0.005	0.021
234	19.50	0.13	0.026	(0.080)	0.005	0.021
235	19.58	0.10	0.019	(0.080)	0.003	0.016
236	19.67	0.10	0.019	(0.079)	0.003	0.016
237	19.75	0.10	0.019	(0.079)	0.003	0.016
238	19.83	0.07	0.013	(0.079)	0.002	0.010
239	19.92	0.07	0.013	(0.078)	0.002	0.010
240	20.00	0.07	0.013	(0.078)	0.002	0.010
241	20.08	0.10	0.019	(0.078)	0.003	0.016
242	20.17	0.10	0.019	(0.077)	0.003	0.016
243	20.25	0.10	0.019	(0.077)	0.003	0.016
244	20.33	0.10	0.019	(0.077)	0.003	0.016
245	20.42	0.10	0.019	(0.076)	0.003	0.016
246	20.50	0.10	0.019	(0.076)	0.003	0.016
247	20.58	0.10	0.019	(0.076)	0.003	0.016
248	20.67	0.10	0.019	(0.075)	0.003	0.016
249	20.75	0.10	0.019	(0.075)	0.003	0.016
250	20.83	0.07	0.013	(0.075)	0.002	0.010
251	20.92	0.07	0.013	(0.074)	0.002	0.010
252	21.00	0.07	0.013	(0.074)	0.002	0.010
253	21.08	0.10	0.019	(0.074)	0.003	0.016
254	21.17	0.10	0.019	(0.073)	0.003	0.016
255	21.25	0.10	0.019	(0.073)	0.003	0.016
256	21.33	0.07	0.013	(0.073)	0.002	0.010
257	21.42	0.07	0.013	(0.073)	0.002	0.010
258	21.50	0.07	0.013	(0.072)	0.002	0.010
259	21.58	0.10	0.019	(0.072)	0.003	0.016
260	21.67	0.10	0.019	(0.072)	0.003	0.016
261	21.75	0.10	0.019	(0.072)	0.003	0.016
262	21.83	0.07	0.013	(0.071)	0.002	0.010
263	21.92	0.07	0.013	(0.071)	0.002	0.010
264	22.00	0.07	0.013	(0.071)	0.002	0.010
265	22.08	0.10	0.019	(0.071)	0.003	0.016
266	22.17	0.10	0.019	(0.070)	0.003	0.016
267	22.25	0.10	0.019	(0.070)	0.003	0.016
268	22.33	0.07	0.013	(0.070)	0.002	0.010
269	22.42	0.07	0.013	(0.070)	0.002	0.010
270	22.50	0.07	0.013	(0.069)	0.002	0.010
271	22.58	0.07	0.013	(0.069)	0.002	0.010
272	22.67	0.07	0.013	(0.069)	0.002	0.010
273	22.75	0.07	0.013	(0.069)	0.002	0.010
274	22.83	0.07	0.013	(0.069)	0.002	0.010
275	22.92	0.07	0.013	(0.069)	0.002	0.010
276	23.00	0.07	0.013	(0.068)	0.002	0.010
277	23.08	0.07	0.013	(0.068)	0.002	0.010
278	23.17	0.07	0.013	(0.068)	0.002	0.010
279	23.25	0.07	0.013	(0.068)	0.002	0.010
280	23.33	0.07	0.013	(0.068)	0.002	0.010
281	23.42	0.07	0.013	(0.068)	0.002	0.010
282	23.50	0.07	0.013	(0.068)	0.002	0.010
283	23.58	0.07	0.013	(0.067)	0.002	0.010

284	23.67	0.07	0.013	(0.067)	0.002	0.010
285	23.75	0.07	0.013	(0.067)	0.002	0.010
286	23.83	0.07	0.013	(0.067)	0.002	0.010
287	23.92	0.07	0.013	(0.067)	0.002	0.010
288	24.00	0.07	0.013	(0.067)	0.002	0.010

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.7

Flood volume = Effective rainfall 1.31(In)
times area 21.7(Ac.)/[(In)/(Ft.)] = 2.4(Ac.Ft)
Total soil loss = 0.29(In)
Total soil loss = 0.521(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 103343.2 Cubic Feet
Total soil loss = 22685.1 Cubic Feet

Peak flow rate of this hydrograph = 3.904(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0005	0.08	Q	|	|	|	|
0+10	0.0018	0.18	Q	|	|	|	|
0+15	0.0032	0.21	Q	|	|	|	|
0+20	0.0050	0.26	VQ	|	|	|	|
0+25	0.0072	0.32	VQ	|	|	|	|
0+30	0.0095	0.33	VQ	|	|	|	|
0+35	0.0119	0.34	VQ	|	|	|	|
0+40	0.0142	0.34	VQ	|	|	|	|
0+45	0.0166	0.34	VQ	|	|	|	|
0+50	0.0193	0.38	VQ	|	|	|	|
0+55	0.0223	0.44	VQ	|	|	|	|
1+ 0	0.0254	0.45	VQ	|	|	|	|
1+ 5	0.0282	0.42	VQ	|	|	|	|
1+10	0.0307	0.37	VQ	|	|	|	|
1+15	0.0332	0.35	VQ	|	|	|	|
1+20	0.0356	0.35	VQ	|	|	|	|
1+25	0.0380	0.35	VQ	|	|	|	|
1+30	0.0403	0.34	VQ	|	|	|	|
1+35	0.0427	0.34	VQ	|	|	|	|
1+40	0.0451	0.34	VQ	|	|	|	|
1+45	0.0475	0.34	VQ	|	|	|	|
1+50	0.0501	0.38	VQ	|	|	|	|
1+55	0.0531	0.44	VQ	|	|	|	|
2+ 0	0.0562	0.45	VQ	|	|	|	|
2+ 5	0.0593	0.46	|Q	|	|	|	|
2+10	0.0625	0.46	|Q	|	|	|	|
2+15	0.0656	0.46	|Q	|	|	|	|
2+20	0.0688	0.46	|Q	|	|	|	|
2+25	0.0720	0.46	|Q	|	|	|	|
2+30	0.0751	0.46	|Q	|	|	|	|

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2+35      0.0786      0.50  |Q        |         |         |         |
2+40      0.0824      0.55  |VQ       |         |         |         |
2+45      0.0862      0.56  |VQ       |         |         |         |
2+50      0.0902      0.57  |VQ       |         |         |         |
2+55      0.0941      0.57  |VQ       |         |         |         |
3+ 0      0.0981      0.57  |VQ       |         |         |         |
3+ 5      0.1020      0.57  |VQ       |         |         |         |
3+10      0.1060      0.57  |VQ       |         |         |         |
3+15      0.1099      0.57  |VQ       |         |         |         |
3+20      0.1139      0.57  |VQ       |         |         |         |
3+25      0.1178      0.57  |VQ       |         |         |         |
3+30      0.1218      0.57  | Q       |         |         |         |
3+35      0.1258      0.57  | Q       |         |         |         |
3+40      0.1297      0.57  | Q       |         |         |         |
3+45      0.1337      0.57  | Q       |         |         |         |
3+50      0.1379      0.61  | Q       |         |         |         |
3+55      0.1425      0.67  | Q       |         |         |         |
4+ 0      0.1471      0.68  | Q       |         |         |         |
4+ 5      0.1519      0.68  | Q       |         |         |         |
4+10      0.1566      0.69  | Q       |         |         |         |
4+15      0.1613      0.69  | Q       |         |         |         |
4+20      0.1663      0.73  | Q       |         |         |         |
4+25      0.1717      0.78  | VQ      |         |         |         |
4+30      0.1772      0.79  | VQ      |         |         |         |
4+35      0.1827      0.80  |  Q      |         |         |         |
4+40      0.1882      0.80  |  Q      |         |         |         |
4+45      0.1938      0.80  |  Q      |         |         |         |
4+50      0.1996      0.84  |  Q      |         |         |         |
4+55      0.2057      0.90  |  Q      |         |         |         |
5+ 0      0.2120      0.91  |  Q      |         |         |         |
5+ 5      0.2178      0.84  |  Q      |         |         |         |
5+10      0.2228      0.73  | QV      |         |         |         |
5+15      0.2277      0.71  | QV      |         |         |         |
5+20      0.2328      0.74  | QV      |         |         |         |
5+25      0.2382      0.78  |  QV     |         |         |         |
5+30      0.2436      0.79  |  QV     |         |         |         |
5+35      0.2494      0.84  |  QV     |         |         |         |
5+40      0.2556      0.89  |  QV     |         |         |         |
5+45      0.2618      0.91  |  QV     |         |         |         |
5+50      0.2681      0.91  |  QV     |         |         |         |
5+55      0.2744      0.92  |  QV     |         |         |         |
6+ 0      0.2808      0.92  |  QV     |         |         |         |
6+ 5      0.2873      0.96  |  QV     |         |         |         |
6+10      0.2943      1.01  |   Q     |         |         |         |
6+15      0.3014      1.02  |   QV    |         |         |         |
6+20      0.3084      1.03  |   QV    |         |         |         |
6+25      0.3156      1.03  |   QV    |         |         |         |
6+30      0.3227      1.03  |   QV    |         |         |         |
6+35      0.3301      1.07  |   QV    |         |         |         |
6+40      0.3378      1.13  |   QV    |         |         |         |
6+45      0.3456      1.14  |   QV    |         |         |         |
6+50      0.3535      1.14  |   QV    |         |         |         |
6+55      0.3614      1.15  |   Q V   |         |         |         |
7+ 0      0.3693      1.15  |   Q V   |         |         |         |
7+ 5      0.3772      1.15  |   Q V   |         |         |         |
7+10      0.3852      1.15  |   Q V   |         |         |         |
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7+15      0.3931      1.15  |   Q V   |         |         |         |
7+20      0.4012      1.19  |   Q V   |         |         |         |
7+25      0.4098      1.24  |   Q V   |         |         |         |
7+30      0.4184      1.25  |    Q V  |         |         |         |
7+35      0.4273      1.30  |    Q V  |         |         |         |
7+40      0.4367      1.35  |    Q V  |         |         |         |
7+45      0.4461      1.37  |    Q V  |         |         |         |
7+50      0.4558      1.41  |    Q V  |         |         |         |
7+55      0.4659      1.47  |    Q V  |         |         |         |
8+ 0      0.4761      1.48  |    Q  V |         |         |         |
8+ 5      0.4869      1.57  |     Q V |         |         |         |
8+10      0.4985      1.68  |     Q V |         |         |         |
8+15      0.5102      1.70  |     Q V |         |         |         |
8+20      0.5220      1.71  |     Q V |         |         |         |
8+25      0.5338      1.72  |     Q  V|         |         |         |
8+30      0.5457      1.72  |     Q  V|         |         |         |
8+35      0.5578      1.76  |      Q V|         |         |         |
8+40      0.5703      1.81  |      Q V|         |         |         |
8+45      0.5829      1.83  |      Q V|         |         |         |
8+50      0.5958      1.87  |      Q  V         |         |         |
8+55      0.6091      1.93  |      Q  V         |         |         |
9+ 0      0.6224      1.94  |      Q  V         |         |         |
9+ 5      0.6364      2.02  |       Q V         |         |         |
9+10      0.6511      2.14  |       Q V         |         |         |
9+15      0.6660      2.16  |       Q |V        |         |         |
9+20      0.6812      2.21  |       Q |V        |         |         |
9+25      0.6969      2.27  |        Q|V        |         |         |
9+30      0.7126      2.29  |        Q| V       |         |         |
9+35      0.7287      2.33  |        Q| V       |         |         |
9+40      0.7451      2.39  |        Q| V       |         |         |
9+45      0.7616      2.40  |        Q| V       |         |         |
9+50      0.7785      2.45  |        Q|  V      |         |         |
9+55      0.7957      2.50  |         Q  V      |         |         |
10+ 0     0.8130      2.52  |         Q  V      |         |         |
10+ 5     0.8286      2.25  |        Q|  V      |         |         |
10+10     0.8415      1.88  |      Q  |   V     |         |         |
10+15     0.8538      1.79  |      Q  |   V     |         |         |
10+20     0.8659      1.75  |      Q  |   V     |         |         |
10+25     0.8778      1.73  |     Q   |   V     |         |         |
10+30     0.8897      1.72  |     Q   |    V    |         |         |
10+35     0.9029      1.91  |      Q  |    V    |         |         |
10+40     0.9179      2.18  |       Q |    V    |         |         |
10+45     0.9334      2.25  |       Q |    V    |         |         |
10+50     0.9491      2.28  |        Q|     V   |         |         |
10+55     0.9648      2.29  |        Q|     V   |         |         |
11+ 0     0.9807      2.30  |        Q|     V   |         |         |
11+ 5     0.9962      2.26  |        Q|     V   |         |         |
11+10     1.0114      2.20  |       Q |      V  |         |         |
11+15     1.0265      2.19  |       Q |      V  |         |         |
11+20     1.0415      2.19  |       Q |      V  |         |         |
11+25     1.0566      2.18  |       Q |      V  |         |         |
11+30     1.0716      2.18  |       Q |       V |         |         |
11+35     1.0861      2.10  |       Q |       V |         |         |
11+40     1.0998      2.00  |      Q  |       V |         |         |
11+45     1.1134      1.97  |      Q  |       V |         |         |
11+50     1.1272      2.00  |      Q  |        V|         |         |
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11+55       1.1413      2.05  |       Q |        V|         |         |
12+ 0       1.1555      2.06  |       Q |        V|         |         |
12+ 5       1.1715      2.33  |        Q|        V|         |         |
12+10       1.1902      2.71  |         Q         V         |         |
12+15       1.2095      2.80  |         |Q        V         |         |
12+20       1.2293      2.88  |         |Q        V         |         |
12+25       1.2497      2.95  |         |Q        |V        |         |
12+30       1.2701      2.98  |         |Q        |V        |         |
12+35       1.2912      3.06  |         | Q       |V        |         |
12+40       1.3130      3.17  |         | Q       | V       |         |
12+45       1.3350      3.20  |         | Q       | V       |         |
12+50       1.3574      3.25  |         | Q       | V       |         |
12+55       1.3801      3.30  |         |  Q      |  V      |         |
13+ 0       1.4030      3.32  |         |  Q      |  V      |         |
13+ 5       1.4272      3.52  |         |   Q     |   V     |         |
13+10       1.4533      3.79  |         |    Q    |   V     |         |
13+15       1.4799      3.86  |         |    Q    |   V     |         |
13+20       1.5066      3.88  |         |    Q    |    V    |         |
13+25       1.5335      3.90  |         |    Q    |    V    |         |
13+30       1.5604      3.90  |         |    Q    |     V   |         |
13+35       1.5843      3.48  |         |  Q      |     V   |         |
13+40       1.6042      2.89  |         |Q        |      V  |         |
13+45       1.6232      2.75  |         Q         |      V  |         |
13+50       1.6417      2.69  |         Q         |      V  |         |
13+55       1.6600      2.66  |         Q         |      V  |         |
14+ 0       1.6782      2.64  |         Q         |       V |         |
14+ 5       1.6974      2.79  |         |Q        |       V |         |
14+10       1.7181      3.01  |         | Q       |       V |         |
14+15       1.7392      3.06  |         | Q       |        V|         |
14+20       1.7602      3.05  |         | Q       |        V|         |
14+25       1.7809      3.00  |         | Q       |         V         |
14+30       1.8015      3.00  |         |Q        |         V         |
14+35       1.8221      2.99  |         |Q        |         V         |
14+40       1.8427      2.99  |         |Q        |         |V        |
14+45       1.8632      2.99  |         |Q        |         |V        |
14+50       1.8835      2.95  |         |Q        |         |V        |
14+55       1.9034      2.89  |         |Q        |         | V       |
15+ 0       1.9233      2.88  |         |Q        |         | V       |
15+ 5       1.9428      2.84  |         |Q        |         | V       |
15+10       1.9620      2.78  |         |Q        |         |  V      |
15+15       1.9810      2.77  |         |Q        |         |  V      |
15+20       1.9997      2.72  |         Q         |         |  V      |
15+25       2.0181      2.66  |         Q         |         |   V     |
15+30       2.0364      2.65  |         Q         |         |   V     |
15+35       2.0535      2.49  |        Q|         |         |   V     |
15+40       2.0692      2.27  |        Q|         |         |   V     |
15+45       2.0845      2.22  |       Q |         |         |    V    |
15+50       2.0996      2.20  |       Q |         |         |    V    |
15+55       2.1147      2.19  |       Q |         |         |    V    |
16+ 0       2.1297      2.18  |       Q |         |         |    V    |
16+ 5       2.1408      1.61  |      Q  |         |         |     V   |
16+10       2.1463      0.80  |  Q      |         |         |     V   |
16+15       2.1504      0.61  | Q       |         |         |     V   |
16+20       2.1540      0.52  | Q       |         |         |     V   |
16+25       2.1573      0.48  |Q        |         |         |     V   |
16+30       2.1605      0.46  |Q        |         |         |     V   |
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16+35       2.1634      0.42  |Q        |         |         |     V   |
16+40       2.1659      0.37  |Q        |         |         |     V   |
16+45       2.1684      0.35  |Q        |         |         |     V   |
16+50       2.1708      0.35  |Q        |         |         |     V   |
16+55       2.1732      0.35  |Q        |         |         |     V   |
17+ 0       2.1755      0.34  |Q        |         |         |     V   |
17+ 5       2.1784      0.42  |Q        |         |         |     V   |
17+10       2.1821      0.53  | Q       |         |         |     V   |
17+15       2.1859      0.55  | Q       |         |         |     V   |
17+20       2.1898      0.57  | Q       |         |         |     V   |
17+25       2.1937      0.57  | Q       |         |         |     V   |
17+30       2.1977      0.57  | Q       |         |         |      V  |
17+35       2.2016      0.57  | Q       |         |         |      V  |
17+40       2.2056      0.57  | Q       |         |         |      V  |
17+45       2.2095      0.57  | Q       |         |         |      V  |
17+50       2.2132      0.54  | Q       |         |         |      V  |
17+55       2.2165      0.48  |Q        |         |         |      V  |
18+ 0       2.2198      0.47  |Q        |         |         |      V  |
18+ 5       2.2230      0.46  |Q        |         |         |      V  |
18+10       2.2261      0.46  |Q        |         |         |      V  |
18+15       2.2293      0.46  |Q        |         |         |      V  |
18+20       2.2325      0.46  |Q        |         |         |      V  |
18+25       2.2356      0.46  |Q        |         |         |      V  |
18+30       2.2388      0.46  |Q        |         |         |      V  |
18+35       2.2417      0.42  |Q        |         |         |      V  |
18+40       2.2442      0.37  |Q        |         |         |      V  |
18+45       2.2467      0.35  |Q        |         |         |      V  |
18+50       2.2488      0.31  |Q        |         |         |      V  |
18+55       2.2505      0.25  |Q        |         |         |      V  |
19+ 0       2.2522      0.24  Q         |         |         |      V  |
19+ 5       2.2541      0.27  |Q        |         |         |       V |
19+10       2.2563      0.32  |Q        |         |         |       V |
19+15       2.2586      0.33  |Q        |         |         |       V |
19+20       2.2612      0.38  |Q        |         |         |       V |
19+25       2.2642      0.44  |Q        |         |         |       V |
19+30       2.2673      0.45  |Q        |         |         |       V |
19+35       2.2702      0.42  |Q        |         |         |       V |
19+40       2.2727      0.37  |Q        |         |         |       V |
19+45       2.2751      0.35  |Q        |         |         |       V |
19+50       2.2773      0.31  |Q        |         |         |       V |
19+55       2.2790      0.25  |Q        |         |         |       V |
20+ 0       2.2807      0.24  Q         |         |         |       V |
20+ 5       2.2825      0.27  |Q        |         |         |       V |
20+10       2.2848      0.32  |Q        |         |         |       V |
20+15       2.2871      0.33  |Q        |         |         |       V |
20+20       2.2894      0.34  |Q        |         |         |       V |
20+25       2.2918      0.34  |Q        |         |         |       V |
20+30       2.2942      0.34  |Q        |         |         |       V |
20+35       2.2965      0.34  |Q        |         |         |       V |
20+40       2.2989      0.34  |Q        |         |         |       V |
20+45       2.3013      0.34  |Q        |         |         |       V |
20+50       2.3034      0.31  |Q        |         |         |       V |
20+55       2.3051      0.25  |Q        |         |         |       V |
21+ 0       2.3068      0.24  Q         |         |         |       V |
21+ 5       2.3086      0.27  |Q        |         |         |       V |
21+10       2.3109      0.32  |Q        |         |         |       V |
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   21+15       2.3132      0.33  |Q        |         |         |        V|
   21+20       2.3152      0.30  |Q        |         |         |        V|
   21+25       2.3170      0.25  |Q        |         |         |        V|
   21+30       2.3186      0.24  Q         |         |         |        V|
   21+35       2.3205      0.27  |Q        |         |         |        V|
   21+40       2.3227      0.32  |Q        |         |         |        V|
   21+45       2.3250      0.33  |Q        |         |         |        V|
   21+50       2.3271      0.30  |Q        |         |         |        V|
   21+55       2.3288      0.25  |Q        |         |         |        V|
   22+ 0       2.3305      0.24  Q         |         |         |        V|
   22+ 5       2.3324      0.27  |Q        |         |         |        V|
   22+10       2.3346      0.32  |Q        |         |         |        V|
   22+15       2.3369      0.33  |Q        |         |         |        V|
   22+20       2.3390      0.30  |Q        |         |         |        V|
   22+25       2.3407      0.25  |Q        |         |         |        V|
   22+30       2.3423      0.24  Q         |         |         |        V|
   22+35       2.3440      0.23  Q         |         |         |        V|
   22+40       2.3456      0.23  Q         |         |         |        V|
   22+45       2.3471      0.23  Q         |         |         |        V|
   22+50       2.3487      0.23  Q         |         |         |        V|
   22+55       2.3503      0.23  Q         |         |         |        V|
   23+ 0       2.3519      0.23  Q         |         |         |        V|
   23+ 5       2.3535      0.23  Q         |         |         |        V|
   23+10       2.3550      0.23  Q         |         |         |        V|
   23+15       2.3566      0.23  Q         |         |         |        V|
   23+20       2.3582      0.23  Q         |         |         |        V|
   23+25       2.3598      0.23  Q         |         |         |        V|
   23+30       2.3614      0.23  Q         |         |         |        V|
   23+35       2.3629      0.23  Q         |         |         |        V|
   23+40       2.3645      0.23  Q         |         |         |        V|
   23+45       2.3661      0.23  Q         |         |         |        V|
   23+50       2.3677      0.23  Q         |         |         |        V|
   23+55       2.3693      0.23  Q         |         |         |        V|
   24+ 0       2.3709      0.23  Q         |         |         |        V|
   24+ 5       2.3719      0.15  Q         |         |         |        V|
   24+10       2.3722      0.05  Q         |         |         |        V|
   24+15       2.3724      0.02  Q         |         |         |        V|
   24+20       2.3724      0.01  Q         |         |         |        V|
   24+25       2.3724      0.00  Q         |         |         |         V
----------------------------------------------------------------------
```

Unit Hydrographs 100 Year, Post-Project for Mission Pacific Site

```
      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  11/12/12 File: postcondmp1100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
100 Year Storm Event
Mission Pacific Site
Basin Analysis - Post-Project
1-Hour
--------------------------------------------------------------------
Drainage Area =      27.20(Ac.)  =      0.043 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      27.20(Ac.)  =
0.043 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1060.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.201 Mi.
Difference in elevation =      14.00(Ft.)
Slope along watercourse =     34.8679 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.070 Hr.
Lag time =     4.22 Min.
25% of lag time =     1.06 Min.
40% of lag time =     1.69 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             0.50                 13.60

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             1.20                 32.64

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.500(In)
Area Averaged 100-Year Rainfall =    1.200(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    1.200(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    27.200           56.00         0.650
 Total Area Entered =     27.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.650        0.212       1.000      0.212
                                                    Sum (F) =   0.212
Area averaged mean soil loss (F) (In/Hr) =  0.212
Minimum soil loss rate ((In/Hr)) =  0.106
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.380
--------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5000
--------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
--------------------------------------------------------------------
           Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.083        118.346         24.718              6.776
    2   0.167        236.693         48.764             13.368
    3   0.250        355.039         13.456              3.689
    4   0.333        473.386          6.109              1.675
    5   0.417        591.732          3.415              0.936
    6   0.500        710.079          1.988              0.545
    7   0.583        828.425          1.549              0.425
                                Sum = 100.000   Sum=      27.413
--------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
```

```
  1   0.08     4.20      0.605          0.212    (  0.230)        0.393
  2   0.17     4.30      0.619          0.212    (  0.235)        0.407
  3   0.25     5.00      0.720          0.212    (  0.274)        0.508
  4   0.33     5.00      0.720          0.212    (  0.274)        0.508
  5   0.42     5.80      0.835          0.212    (  0.317)        0.623
  6   0.50     6.50      0.936          0.212    (  0.356)        0.724
  7   0.58     7.40      1.065          0.212    (  0.405)        0.853
  8   0.67     8.60      1.238          0.212    (  0.470)        1.026
  9   0.75    12.30      1.771          0.212    (  0.673)        1.559
 10   0.83    29.10      4.189          0.212    (  1.592)        3.977
 11   0.92     6.80      0.979          0.212    (  0.372)        0.767
 12   1.00     5.00      0.720          0.212    (  0.274)        0.508
           (Loss Rate Not Used)
    Sum =     100.0                                Sum =    11.9
     Flood volume = Effective rainfall      0.99(In)
      times area      27.2(Ac.)/[(In)/(Ft.)] =       2.2(Ac.Ft)
     Total soil loss =      0.21(In)
     Total soil loss =     0.480(Ac.Ft)
     Total rainfall =      1.20(In)
     Flood volume =       97523.7 Cubic Feet
     Total soil loss =       20930.3 Cubic Feet
     --------------------------------------------------------------------
      Peak flow rate of this hydrograph =     67.326(CFS)
     --------------------------------------------------------------------
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
     --------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

     --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
  ----------------------------------------------------------------------
    0+ 5       0.0183      2.66  VQ        |         |         |         |
    0+10       0.0735      8.01  |V  Q     |         |         |         |
    0+15       0.1447     10.34  | V  Q    |         |         |         |
    0+20       0.2301     12.40  |   V  Q  |         |         |         |
    0+25       0.3261     13.94  |    V Q  |         |         |         |
    0+30       0.4401     16.56  |      V Q|         |         |         |
    0+35       0.5743     19.48  |         VQ        |         |         |
    0+40       0.7327     23.01  |         |  Q      |         |         |
    0+45       0.9375     29.73  |         |     Q   |         |         |
    0+50       1.3112     54.26  |         |         |  V      |Q        |
    0+55       1.7749     67.33  |         |         |         |V      Q |
    1+ 0       2.0003     32.73  |         |       Q |         |    V    |
    1+ 5       2.1288     18.67  |         Q         |         |       V |
    1+10       2.1851      8.17  |   Q     |         |         |        V|
    1+15       2.2154      4.40  | Q       |         |         |        V|
    1+20       2.2332      2.58  |Q        |         |         |        V|
    1+25       2.2374      0.60  Q         |         |         |        V|
    1+30       2.2388      0.22  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  11/12/12 File: postcondmp3100.out


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

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
100 Year Storm Event
Mission Pacific Site
Basin Analysis - Post-Project
3-Hour
--------------------------------------------------------------------
Drainage Area =      27.20(Ac.)  =      0.043 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      27.20(Ac.)  =
0.043 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1060.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.201 Mi.
Difference in elevation =      14.00(Ft.)
Slope along watercourse =     34.8679 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.070 Hr.
Lag time =     4.22 Min.
25% of lag time =     1.06 Min.
40% of lag time =     1.69 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             0.80                 21.76

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             1.85                 50.32

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.850(In)

Point rain (area averaged) =    1.850(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.850(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    27.200           56.00         0.650
 Total Area Entered =     27.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.650        0.212       1.000      0.212
                                                    Sum (F) =   0.212
Area averaged mean soil loss (F) (In/Hr) =  0.212
Minimum soil loss rate ((In/Hr)) =  0.106
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.380
--------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
--------------------------------------------------------------------
           Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.083        118.346         24.718              6.776
    2   0.167        236.693         48.764             13.368
    3   0.250        355.039         13.456              3.689
    4   0.333        473.386          6.109              1.675
    5   0.417        591.732          3.415              0.936
    6   0.500        710.079          1.988              0.545
    7   0.583        828.425          1.549              0.425
                                Sum = 100.000   Sum=      27.413
--------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     1.30      0.289       (  0.212)       0.110        0.179
   2   0.17     1.30      0.289       (  0.212)       0.110        0.179
```

3	0.25	1.10	0.244	(0.212)	0.093	0.151
4	0.33	1.50	0.333	(0.212)	0.127	0.206
5	0.42	1.50	0.333	(0.212)	0.127	0.206
6	0.50	1.80	0.400	(0.212)	0.152	0.248
7	0.58	1.50	0.333	(0.212)	0.127	0.206
8	0.67	1.80	0.400	(0.212)	0.152	0.248
9	0.75	1.80	0.400	(0.212)	0.152	0.248
10	0.83	1.50	0.333	(0.212)	0.127	0.206
11	0.92	1.60	0.355	(0.212)	0.135	0.220
12	1.00	1.80	0.400	(0.212)	0.152	0.248
13	1.08	2.20	0.488	(0.212)	0.186	0.303
14	1.17	2.20	0.488	(0.212)	0.186	0.303
15	1.25	2.20	0.488	(0.212)	0.186	0.303
16	1.33	2.00	0.444	(0.212)	0.169	0.275
17	1.42	2.60	0.577	0.212	(0.219)	0.365
18	1.50	2.70	0.599	0.212	(0.228)	0.387
19	1.58	2.40	0.533	(0.212)	0.202	0.330
20	1.67	2.70	0.599	0.212	(0.228)	0.387
21	1.75	3.30	0.733	0.212	(0.278)	0.521
22	1.83	3.10	0.688	0.212	(0.261)	0.476
23	1.92	2.90	0.644	0.212	(0.245)	0.432
24	2.00	3.00	0.666	0.212	(0.253)	0.454
25	2.08	3.10	0.688	0.212	(0.261)	0.476
26	2.17	4.20	0.932	0.212	(0.354)	0.720
27	2.25	5.00	1.110	0.212	(0.422)	0.898
28	2.33	3.50	0.777	0.212	(0.295)	0.565
29	2.42	6.80	1.509	0.212	(0.574)	1.297
30	2.50	7.30	1.620	0.212	(0.616)	1.408
31	2.58	8.20	1.820	0.212	(0.692)	1.608
32	2.67	5.90	1.310	0.212	(0.498)	1.098
33	2.75	2.00	0.444	(0.212)	0.169	0.275
34	2.83	1.80	0.400	(0.212)	0.152	0.248
35	2.92	1.80	0.400	(0.212)	0.152	0.248
36	3.00	0.60	0.133	(0.212)	0.051	0.083

(Loss Rate Not Used)

Sum = 100.0 Sum = 16.0

Flood volume = Effective rainfall 1.33(In)
times area 27.2(Ac.)/[(In)/(Ft.)] = 3.0(Ac.Ft)
Total soil loss = 0.52(In)
Total soil loss = 1.169(Ac.Ft)
Total rainfall = 1.85(In)
Flood volume = 131700.1 Cubic Feet
Total soil loss = 50939.7 Cubic Feet

Peak flow rate of this hydrograph = 37.647(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
-----------------------------------------------------------------------------
  0+ 5       0.0084      1.21  VQ        |         |         |         |
  0+10       0.0332      3.61  V  Q      |         |         |         |
  0+15       0.0613      4.08  V   Q     |         |         |         |
  0+20       0.0915      4.38  |V  Q     |         |         |         |
  0+25       0.1272      5.19  |V   Q    |         |         |         |
  0+30       0.1666      5.72  | V  Q    |         |         |         |
  0+35       0.2089      6.14  | V   Q   |         |         |         |
  0+40       0.2505      6.05  |  V  Q   |         |         |         |
  0+45       0.2956      6.54  |  V  Q   |         |         |         |
  0+50       0.3397      6.41  |   V Q   |         |         |         |
  0+55       0.3810      6.00  |    Q    |         |         |         |
  1+ 0       0.4241      6.25  |    VQ   |         |         |         |
  1+ 5       0.4721      6.98  |     Q   |         |         |         |
  1+10       0.5260      7.82  |     VQ  |         |         |         |
  1+15       0.5815      8.06  |      VQ |         |         |         |
  1+20       0.6364      7.98  |      QV |         |         |         |
  1+25       0.6935      8.29  |       QV|         |         |         |
  1+30       0.7596      9.59  |        QV         |         |         |
  1+35       0.8271      9.81  |        QV         |         |         |
  1+40       0.8935      9.64  |        Q|V        |         |         |
  1+45       0.9706     11.20  |         |QV       |         |         |
  1+50       1.0591     12.85  |         | Q V     |         |         |
  1+55       1.1455     12.54  |         | Q  V    |         |         |
  2+ 0       1.2294     12.19  |         | Q   V   |         |         |
  2+ 5       1.3157     12.53  |         | Q    V  |         |         |
  2+10       1.4159     14.54  |         |   Q   V |         |         |
  2+15       1.5476     19.12  |         |        QV         |         |
  2+20       1.6864     20.16  |         |         Q V       |         |
  2+25       1.8362     21.75  |         |         |Q  V      |         |
  2+30       2.0539     31.62  |         |         |      V  |Q        |
  2+35       2.3081     36.91  |         |         |        V     Q   |
  2+40       2.5674     37.65  |         |         |         |  V   Q  |
  2+45       2.7516     26.75  |         |         |     Q   |     V   |
  2+50       2.8506     14.37  |         |   Q     |         |      V  |
  2+55       2.9241     10.67  |         Q         |         |       V |
  3+ 0       2.9775      7.75  |      Q  |         |         |        V|
  3+ 5       3.0049      3.97  |  Q      |         |         |        V|
  3+10       3.0157      1.57  |Q        |         |         |        V|
  3+15       3.0200      0.62  Q         |         |         |        V|
  3+20       3.0221      0.32  Q         |         |         |        V|
  3+25       3.0232      0.15  Q         |         |         |        V|
  3+30       3.0234      0.04  Q         |         |         |        V|
-----------------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  11/12/12 File: postcondmp6100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
100 Year Storm Event
Mission Pacific Site
Basin Analysis - Post-Project
6-Hour
--------------------------------------------------------------------
Drainage Area =      27.20(Ac.)  =      0.043 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      27.20(Ac.)  =
0.043 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1060.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.201 Mi.
Difference in elevation =      14.00(Ft.)
Slope along watercourse =     34.8679 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.070 Hr.
Lag time =     4.22 Min.
25% of lag time =     1.06 Min.
40% of lag time =     1.69 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             1.00                 27.20

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       27.20             2.50                 68.00

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.000(In)
Area Averaged 100-Year Rainfall =    2.500(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    27.200           56.00         0.650
 Total Area Entered =     27.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.650        0.212       1.000      0.212
                                                   Sum (F) =   0.212
Area averaged mean soil loss (F) (In/Hr) =  0.212
Minimum soil loss rate ((In/Hr)) =  0.106
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.380
--------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
--------------------------------------------------------------------
           Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.083        118.346         24.718              6.776
    2   0.167        236.693         48.764             13.368
    3   0.250        355.039         13.456              3.689
    4   0.333        473.386          6.109              1.675
    5   0.417        591.732          3.415              0.936
    6   0.500        710.079          1.988              0.545
    7   0.583        828.425          1.549              0.425
                                Sum = 100.000   Sum=      27.413
--------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     0.50      0.150       (  0.212)       0.057        0.093
   2   0.17     0.60      0.180       (  0.212)       0.068        0.112
```

3	0.25	0.60	0.180	(0.212)	0.068	0.112
4	0.33	0.60	0.180	(0.212)	0.068	0.112
5	0.42	0.60	0.180	(0.212)	0.068	0.112
6	0.50	0.70	0.210	(0.212)	0.080	0.130
7	0.58	0.70	0.210	(0.212)	0.080	0.130
8	0.67	0.70	0.210	(0.212)	0.080	0.130
9	0.75	0.70	0.210	(0.212)	0.080	0.130
10	0.83	0.70	0.210	(0.212)	0.080	0.130
11	0.92	0.70	0.210	(0.212)	0.080	0.130
12	1.00	0.80	0.240	(0.212)	0.091	0.149
13	1.08	0.80	0.240	(0.212)	0.091	0.149
14	1.17	0.80	0.240	(0.212)	0.091	0.149
15	1.25	0.80	0.240	(0.212)	0.091	0.149
16	1.33	0.80	0.240	(0.212)	0.091	0.149
17	1.42	0.80	0.240	(0.212)	0.091	0.149
18	1.50	0.80	0.240	(0.212)	0.091	0.149
19	1.58	0.80	0.240	(0.212)	0.091	0.149
20	1.67	0.80	0.240	(0.212)	0.091	0.149
21	1.75	0.80	0.240	(0.212)	0.091	0.149
22	1.83	0.80	0.240	(0.212)	0.091	0.149
23	1.92	0.80	0.240	(0.212)	0.091	0.149
24	2.00	0.90	0.270	(0.212)	0.103	0.167
25	2.08	0.80	0.240	(0.212)	0.091	0.149
26	2.17	0.90	0.270	(0.212)	0.103	0.167
27	2.25	0.90	0.270	(0.212)	0.103	0.167
28	2.33	0.90	0.270	(0.212)	0.103	0.167
29	2.42	0.90	0.270	(0.212)	0.103	0.167
30	2.50	0.90	0.270	(0.212)	0.103	0.167
31	2.58	0.90	0.270	(0.212)	0.103	0.167
32	2.67	0.90	0.270	(0.212)	0.103	0.167
33	2.75	1.00	0.300	(0.212)	0.114	0.186
34	2.83	1.00	0.300	(0.212)	0.114	0.186
35	2.92	1.00	0.300	(0.212)	0.114	0.186
36	3.00	1.00	0.300	(0.212)	0.114	0.186
37	3.08	1.00	0.300	(0.212)	0.114	0.186
38	3.17	1.10	0.330	(0.212)	0.125	0.205
39	3.25	1.10	0.330	(0.212)	0.125	0.205
40	3.33	1.10	0.330	(0.212)	0.125	0.205
41	3.42	1.20	0.360	(0.212)	0.137	0.223
42	3.50	1.30	0.390	(0.212)	0.148	0.242
43	3.58	1.40	0.420	(0.212)	0.160	0.260
44	3.67	1.40	0.420	(0.212)	0.160	0.260
45	3.75	1.50	0.450	(0.212)	0.171	0.279
46	3.83	1.50	0.450	(0.212)	0.171	0.279
47	3.92	1.60	0.480	(0.212)	0.182	0.298
48	4.00	1.60	0.480	(0.212)	0.182	0.298
49	4.08	1.70	0.510	(0.212)	0.194	0.316
50	4.17	1.80	0.540	(0.212)	0.205	0.335
51	4.25	1.90	0.570	0.212	(0.217)	0.358
52	4.33	2.00	0.600	0.212	(0.228)	0.388
53	4.42	2.10	0.630	0.212	(0.239)	0.418
54	4.50	2.10	0.630	0.212	(0.239)	0.418
55	4.58	2.20	0.660	0.212	(0.251)	0.448
56	4.67	2.30	0.690	0.212	(0.262)	0.478
57	4.75	2.40	0.720	0.212	(0.274)	0.508
58	4.83	2.40	0.720	0.212	(0.274)	0.508

59	4.92	2.50	0.750	0.212	(0.285)	0.538
60	5.00	2.60	0.780	0.212	(0.296)	0.568
61	5.08	3.10	0.930	0.212	(0.353)	0.718
62	5.17	3.60	1.080	0.212	(0.410)	0.868
63	5.25	3.90	1.170	0.212	(0.445)	0.958
64	5.33	4.20	1.260	0.212	(0.479)	1.048
65	5.42	4.70	1.410	0.212	(0.536)	1.198
66	5.50	5.60	1.680	0.212	(0.638)	1.468
67	5.58	1.90	0.570	0.212	(0.217)	0.358
68	5.67	0.90	0.270	(0.212)	0.103	0.167
69	5.75	0.60	0.180	(0.212)	0.068	0.112
70	5.83	0.50	0.150	(0.212)	0.057	0.093
71	5.92	0.30	0.090	(0.212)	0.034	0.056
72	6.00	0.20	0.060	(0.212)	0.023	0.037

```
          (Loss Rate Not Used)
   Sum =     100.0                                   Sum =    20.6
    Flood volume = Effective rainfall      1.72(In)
     times area      27.2(Ac.)/[(In)/(Ft.)] =       3.9(Ac.Ft)
    Total soil loss =      0.78(In)
    Total soil loss =     1.768(Ac.Ft)
    Total rainfall =      2.50(In)
    Flood volume =      169801.6 Cubic Feet
    Total soil loss =       77015.4 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =     32.890(CFS)
    ---------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        6 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
-------------------------------------------------------------------------
  0+ 5       0.0043      0.63  Q         |         |         |         |
  0+10       0.0181      2.00  V Q       |         |         |         |
  0+15       0.0360      2.59  V Q       |         |         |         |
  0+20       0.0554      2.82  V Q       |         |         |         |
  0+25       0.0756      2.93  V Q       |         |         |         |
  0+30       0.0971      3.13  V  Q      |         |         |         |
  0+35       0.1207      3.43  |V Q      |         |         |         |
  0+40       0.1449      3.50  |V Q      |         |         |         |
  0+45       0.1692      3.54  |V Q      |         |         |         |
  0+50       0.1937      3.55  |V Q      |         |         |         |
  0+55       0.2182      3.56  | VQ      |         |         |         |
  1+ 0       0.2437      3.70  | VQ      |         |         |         |
  1+ 5       0.2708      3.95  | VQ      |         |         |         |
  1+10       0.2985      4.01  |  VQ     |         |         |         |
  1+15       0.3264      4.05  |  VQ     |         |         |         |
  1+20       0.3543      4.06  |  VQ     |         |         |         |
  1+25       0.3824      4.07  |  VQ     |         |         |         |
  1+30       0.4105      4.08  |   Q     |         |         |         |
  1+35       0.4386      4.08  |   Q     |         |         |         |
  1+40       0.4667      4.08  |   Q     |         |         |         |
  1+45       0.4948      4.08  |   QV    |         |         |         |
```

```
1+50       0.5229      4.08  |   QV    |         |         |         |
1+55       0.5510      4.08  |   QV    |         |         |         |
2+ 0       0.5800      4.21  |   QV    |         |         |         |
2+ 5       0.6098      4.33  |   Q V   |         |         |         |
2+10       0.6392      4.28  |   Q V   |         |         |         |
2+15       0.6701      4.49  |   Q V   |         |         |         |
2+20       0.7014      4.54  |   Q  V  |         |         |         |
2+25       0.7329      4.57  |   Q  V  |         |         |         |
2+30       0.7644      4.58  |   Q  V  |         |         |         |
2+35       0.7960      4.58  |   Q   V |         |         |         |
2+40       0.8276      4.59  |   Q   V |         |         |         |
2+45       0.8601      4.72  |   Q   V |         |         |         |
2+50       0.8943      4.97  |   Q    V|         |         |         |
2+55       0.9289      5.03  |    Q   V|         |         |         |
3+ 0       0.9638      5.07  |    Q   V|         |         |         |
3+ 5       0.9988      5.08  |    Q    V         |         |         |
3+10       1.0348      5.22  |    Q    V         |         |         |
3+15       1.0725      5.48  |    Q    |V        |         |         |
3+20       1.1107      5.54  |    Q    |V        |         |         |
3+25       1.1499      5.70  |    Q    |V        |         |         |
3+30       1.1919      6.09  |     Q   | V       |         |         |
3+35       1.2370      6.55  |     Q   | V       |         |         |
3+40       1.2846      6.90  |     Q   |  V      |         |         |
3+45       1.3338      7.15  |      Q  |  V      |         |         |
3+50       1.3851      7.45  |      Q  |   V     |         |         |
3+55       1.4380      7.68  |      Q  |   V     |         |         |
4+ 0       1.4930      7.98  |      Q  |    V    |         |         |
4+ 5       1.5495      8.20  |       Q |    V    |         |         |
4+10       1.6089      8.62  |       Q |     V   |         |         |
4+15       1.6717      9.12  |        Q|      V  |         |         |
4+20       1.7388      9.74  |        Q|      V  |         |         |
4+25       1.8110     10.49  |         Q       V |         |         |
4+30       1.8872     11.07  |         |Q       V|         |         |
4+35       1.9662     11.47  |         |Q        V         |         |
4+40       2.0501     12.17  |         | Q       |V        |         |
4+45       2.1392     12.94  |         | Q       |V        |         |
4+50       2.2325     13.54  |         |  Q      | V       |         |
4+55       2.3285     13.94  |         |  Q      |  V      |         |
5+ 0       2.4293     14.64  |         |   Q     |   V     |         |
5+ 5       2.5411     16.23  |         |     Q   |     V   |         |
5+10       2.6749     19.44  |         |        Q|      V  |         |
5+15       2.8313     22.70  |         |         | Q      V|         |
5+20       3.0059     25.36  |         |         |    Q    V         |
5+25       3.2011     28.34  |         |         |       Q | V       |
5+30       3.4276     32.89  |         |         |         | Q  V    |
5+35       3.6336     29.91  |         |         |        Q|     V   |
5+40       3.7384     15.22  |         |    Q    |         |       V |
5+45       3.7995      8.88  |       Q |         |         |       V |
5+50       3.8396      5.81  |    Q    |         |         |        V|
5+55       3.8669      3.96  |  Q      |         |         |        V|
6+ 0       3.8841      2.50  | Q       |         |         |        V|
6+ 5       3.8924      1.21  |Q        |         |         |        V|
6+10       3.8955      0.45  Q         |         |         |        V|
6+15       3.8970      0.21  Q         |         |         |        V|
6+20       3.8977      0.10  Q         |         |         |        V|
6+25       3.8980      0.04  Q         |         |         |        V|
```



```
6+30       3.8981      0.02  Q         |         |         |        V|
-----------------------------------------------------------------------
```

Unit Hydrographs 100 Year, Post-Project for Walmart Site

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/12/12 File: postcondwm1100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

-------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



-------------------------------------------------------------------
100 Year Storm Event
Walmart Site
Basin Analysis - Post-Project
1-Hour
-------------------------------------------------------------------
Drainage Area =      21.70(Ac.)  =      0.034 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      21.70(Ac.)  =
0.034 Sq. Mi.
Length along longest watercourse =    1530.00(Ft.)
Length along longest watercourse measured to centroid =     765.00(Ft.)
Length along longest watercourse =      0.290 Mi.
Length along longest watercourse measured to centroid =      0.145 Mi.
Difference in elevation =      10.00(Ft.)
Slope along watercourse =     34.5098 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.055 Hr.
Lag time =     3.30 Min.
25% of lag time =     0.83 Min.
40% of lag time =     1.32 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             0.50                 10.85

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             1.20                 26.04

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.500(In)
Area Averaged 100-Year Rainfall =    1.200(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    1.200(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    21.700           56.00         0.900
 Total Area Entered =     21.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.900        0.097       1.000      0.097
                                                    Sum (F) =   0.097
Area averaged mean soil loss (F) (In/Hr) =  0.097
Minimum soil loss rate ((In/Hr)) =  0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.180
-------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5000
-------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
-------------------------------------------------------------------
           Unit Hydrograph Data
-------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
    1   0.083        151.340         33.498              7.326
    2   0.167        302.680         46.912             10.259
    3   0.250        454.019         11.104              2.428
    4   0.333        605.359          4.843              1.059
    5   0.417        756.699          2.428              0.531
    6   0.500        908.039          1.216              0.266
                                Sum = 100.000   Sum=      21.870
-------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     4.20      0.605          0.097    (  0.109)        0.508
```

```
  2   0.17     4.30      0.619          0.097    (  0.111)        0.522
  3   0.25     5.00      0.720          0.097    (  0.130)        0.623
  4   0.33     5.00      0.720          0.097    (  0.130)        0.623
  5   0.42     5.80      0.835          0.097    (  0.150)        0.738
  6   0.50     6.50      0.936          0.097    (  0.168)        0.839
  7   0.58     7.40      1.065          0.097    (  0.192)        0.968
  8   0.67     8.60      1.238          0.097    (  0.223)        1.141
  9   0.75    12.30      1.771          0.097    (  0.319)        1.674
 10   0.83    29.10      4.190          0.097    (  0.754)        4.093
 11   0.92     6.80      0.979          0.097    (  0.176)        0.882
 12   1.00     5.00      0.720          0.097    (  0.130)        0.623
           (Loss Rate Not Used)
    Sum =     100.0                                   Sum =    13.2
     Flood volume = Effective rainfall      1.10(In)
      times area      21.7(Ac.)/[(In)/(Ft.)] =       2.0(Ac.Ft)
     Total soil loss =      0.10(In)
     Total soil loss =     0.176(Ac.Ft)
     Total rainfall =      1.20(In)
     Flood volume =       86861.7 Cubic Feet
     Total soil loss =        7644.9 Cubic Feet
     --------------------------------------------------------------------
      Peak flow rate of this hydrograph =     54.486(CFS)
     --------------------------------------------------------------------
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
     --------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

     --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
  ----------------------------------------------------------------------
    0+ 5       0.0256      3.72  V Q       |         |         |         |
    0+10       0.0879      9.04  |V    Q   |         |         |         |
    0+15       0.1647     11.16  |  V   Q  |         |         |         |
    0+20       0.2526     12.76  |    V  Q |         |         |         |
    0+25       0.3500     14.14  |      V Q|         |         |         |
    0+30       0.4623     16.31  |        VQ         |         |         |
    0+35       0.5906     18.63  |         |VQ       |         |         |
    0+40       0.7395     21.62  |         |   Q     |         |         |
    0+45       0.9308     27.78  |         |       Q |         |         |
    0+50       1.2863     51.62  |         |         |    V    |   Q     |
    0+55       1.6616     54.49  |         |         |         |  V  Q   |
    1+ 0       1.8420     26.20  |         |      Q  |         |     V   |
    1+ 5       1.9389     14.07  |        Q|         |         |       V |
    1+10       1.9738      5.07  |  Q      |         |         |        V|
    1+15       1.9890      2.22  |Q        |         |         |        V|
    1+20       1.9929      0.57  Q         |         |         |        V|
    1+25       1.9941      0.17  Q         |         |         |        V|
----------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/12/12 File: postcondwm3100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
100 Year Storm Event
Walmart Site
Basin Analysis - Post-Project
3-Hour
--------------------------------------------------------------------
Drainage Area =      21.70(Ac.)  =      0.034 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      21.70(Ac.)  =
0.034 Sq. Mi.
Length along longest watercourse =    1530.00(Ft.)
Length along longest watercourse measured to centroid =     765.00(Ft.)
Length along longest watercourse =      0.290 Mi.
Length along longest watercourse measured to centroid =      0.145 Mi.
Difference in elevation =      10.00(Ft.)
Slope along watercourse =     34.5098 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.055 Hr.
Lag time =     3.30 Min.
25% of lag time =     0.83 Min.
40% of lag time =     1.32 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             0.80                 17.36

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             1.85                 40.15

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.850(In)

Point rain (area averaged) =    1.850(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.850(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    21.700           56.00         0.900
 Total Area Entered =     21.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.900        0.097       1.000      0.097
                                                    Sum (F) =   0.097
Area averaged mean soil loss (F) (In/Hr) =  0.097
Minimum soil loss rate ((In/Hr)) =  0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.180
--------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
--------------------------------------------------------------------
           Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.083        151.340         33.498              7.326
    2   0.167        302.680         46.912             10.259
    3   0.250        454.019         11.104              2.428
    4   0.333        605.359          4.843              1.059
    5   0.417        756.699          2.428              0.531
    6   0.500        908.039          1.216              0.266
                                Sum = 100.000   Sum=      21.870
--------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     1.30      0.289       (  0.097)       0.052        0.237
   2   0.17     1.30      0.289       (  0.097)       0.052        0.237
   3   0.25     1.10      0.244       (  0.097)       0.044        0.200
```

4	0.33	1.50	0.333	(0.097)	0.060	0.273
5	0.42	1.50	0.333	(0.097)	0.060	0.273
6	0.50	1.80	0.400	(0.097)	0.072	0.328
7	0.58	1.50	0.333	(0.097)	0.060	0.273
8	0.67	1.80	0.400	(0.097)	0.072	0.328
9	0.75	1.80	0.400	(0.097)	0.072	0.328
10	0.83	1.50	0.333	(0.097)	0.060	0.273
11	0.92	1.60	0.355	(0.097)	0.064	0.291
12	1.00	1.80	0.400	(0.097)	0.072	0.328
13	1.08	2.20	0.488	(0.097)	0.088	0.400
14	1.17	2.20	0.488	(0.097)	0.088	0.400
15	1.25	2.20	0.488	(0.097)	0.088	0.400
16	1.33	2.00	0.444	(0.097)	0.080	0.364
17	1.42	2.60	0.577	0.097	(0.104)	0.480
18	1.50	2.70	0.599	0.097	(0.108)	0.502
19	1.58	2.40	0.533	(0.097)	0.096	0.437
20	1.67	2.70	0.599	0.097	(0.108)	0.502
21	1.75	3.30	0.733	0.097	(0.132)	0.635
22	1.83	3.10	0.688	0.097	(0.124)	0.591
23	1.92	2.90	0.644	0.097	(0.116)	0.547
24	2.00	3.00	0.666	0.097	(0.120)	0.569
25	2.08	3.10	0.688	0.097	(0.124)	0.591
26	2.17	4.20	0.932	0.097	(0.168)	0.835
27	2.25	5.00	1.110	0.097	(0.200)	1.013
28	2.33	3.50	0.777	0.097	(0.140)	0.680
29	2.42	6.80	1.509	0.097	(0.272)	1.412
30	2.50	7.30	1.620	0.097	(0.292)	1.523
31	2.58	8.20	1.820	0.097	(0.328)	1.723
32	2.67	5.90	1.310	0.097	(0.236)	1.213
33	2.75	2.00	0.444	(0.097)	0.080	0.364
34	2.83	1.80	0.400	(0.097)	0.072	0.328
35	2.92	1.80	0.400	(0.097)	0.072	0.328
36	3.00	0.60	0.133	(0.097)	0.024	0.109

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.3

Flood volume = Effective rainfall 1.61(In)
times area 21.7(Ac.)/[(In)/(Ft.)] = 2.9(Ac.Ft)
Total soil loss = 0.24(In)
Total soil loss = 0.434(Ac.Ft)
Total rainfall = 1.85(In)
Flood volume = 126792.9 Cubic Feet
Total soil loss = 18919.6 Cubic Feet

Peak flow rate of this hydrograph = 33.180(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
-----------------------------------------------------------------------
  0+ 5       0.0119      1.73  VQ        |         |         |         |
  0+10       0.0406      4.16  V   Q     |         |         |         |
```



```
  0+15       0.0714      4.47  V   Q     |         |         |         |
  0+20       0.1050      4.88  |V  Q     |         |         |         |
  0+25       0.1441      5.67  |V   Q    |         |         |         |
  0+30       0.1872      6.27  | V   Q   |         |         |         |
  0+35       0.2319      6.49  |  V  Q   |         |         |         |
  0+40       0.2766      6.49  |  V  Q   |         |         |         |
  0+45       0.3247      6.99  |   V Q   |         |         |         |
  0+50       0.3709      6.70  |    VQ   |         |         |         |
  0+55       0.4143      6.31  |    VQ   |         |         |         |
  1+ 0       0.4601      6.65  |     Q   |         |         |         |
  1+ 5       0.5122      7.56  |      Q  |         |         |         |
  1+10       0.5699      8.38  |      VQ |         |         |         |
  1+15       0.6291      8.59  |       Q |         |         |         |
  1+20       0.6871      8.43  |       QV|         |         |         |
  1+25       0.7488      8.95  |       Q V         |         |         |
  1+30       0.8193     10.24  |         QV        |         |         |
  1+35       0.8897     10.23  |         Q V       |         |         |
  1+40       0.9600     10.19  |         Q  V      |         |         |
  1+45       1.0409     11.76  |         |Q  V     |         |         |
  1+50       1.1300     12.93  |         | Q  V    |         |         |
  1+55       1.2162     12.52  |         | Q   V   |         |         |
  2+ 0       1.3007     12.27  |         | Q    V  |         |         |
  2+ 5       1.3875     12.60  |         | Q      V|         |         |
  2+10       1.4883     14.63  |         |   Q     V         |         |
  2+15       1.6156     18.48  |         |       Q | V       |         |
  2+20       1.7429     18.48  |         |       Q |  V      |         |
  2+25       1.8885     21.14  |         |         |Q   V    |         |
  2+30       2.0881     28.99  |         |         |       Q |         |
  2+35       2.3167     33.18  |         |         |         |V Q      |
  2+40       2.5398     32.40  |         |         |         | Q V     |
  2+45       2.6903     21.85  |         |         |Q        |     V   |
  2+50       2.7736     12.10  |         | Q       |         |       V |
  2+55       2.8373      9.25  |        Q|         |         |       V |
  3+ 0       2.8817      6.45  |     Q   |         |         |        V|
  3+ 5       2.9009      2.78  | Q       |         |         |        V|
  3+10       2.9070      0.88  Q         |         |         |        V|
  3+15       2.9096      0.38  Q         |         |         |        V|
  3+20       2.9106      0.15  Q         |         |         |        V|
  3+25       2.9108      0.03  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  11/12/12 File: postcondwm6100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6269

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
100 Year Storm Event
Walmart Site
Basin Analysis - Post-Project
6-Hour
--------------------------------------------------------------------
Drainage Area =      21.70(Ac.)  =      0.034 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      21.70(Ac.)  =
0.034 Sq. Mi.
Length along longest watercourse =    1530.00(Ft.)
Length along longest watercourse measured to centroid =     765.00(Ft.)
Length along longest watercourse =      0.290 Mi.
Length along longest watercourse measured to centroid =      0.145 Mi.
Difference in elevation =      10.00(Ft.)
Slope along watercourse =     34.5098 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.055 Hr.
Lag time =     3.30 Min.
25% of lag time =     0.83 Min.
40% of lag time =     1.32 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             1.00                 21.70

100 YEAR Area rainfall data:
```



```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       21.70             2.50                 54.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.000(In)
Area Averaged 100-Year Rainfall =    2.500(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    21.700           56.00         0.900
 Total Area Entered =     21.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.900        0.097       1.000      0.097
                                                    Sum (F) =   0.097
Area averaged mean soil loss (F) (In/Hr) =  0.097
Minimum soil loss rate ((In/Hr)) =  0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.180
--------------------------------------------------------------------

           U n i t  H y d r o g r a p h
                 VALLEY S-Curve
--------------------------------------------------------------------
           Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.083        151.340         33.498              7.326
    2   0.167        302.680         46.912             10.259
    3   0.250        454.019         11.104              2.428
    4   0.333        605.359          4.843              1.059
    5   0.417        756.699          2.428              0.531
    6   0.500        908.039          1.216              0.266
                                 Sum = 100.000   Sum=      21.870
--------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     0.50      0.150       (  0.097)       0.027        0.123
   2   0.17     0.60      0.180       (  0.097)       0.032        0.148
   3   0.25     0.60      0.180       (  0.097)       0.032        0.148
```

4	0.33	0.60	0.180	(0.097)	0.032	0.148
5	0.42	0.60	0.180	(0.097)	0.032	0.148
6	0.50	0.70	0.210	(0.097)	0.038	0.172
7	0.58	0.70	0.210	(0.097)	0.038	0.172
8	0.67	0.70	0.210	(0.097)	0.038	0.172
9	0.75	0.70	0.210	(0.097)	0.038	0.172
10	0.83	0.70	0.210	(0.097)	0.038	0.172
11	0.92	0.70	0.210	(0.097)	0.038	0.172
12	1.00	0.80	0.240	(0.097)	0.043	0.197
13	1.08	0.80	0.240	(0.097)	0.043	0.197
14	1.17	0.80	0.240	(0.097)	0.043	0.197
15	1.25	0.80	0.240	(0.097)	0.043	0.197
16	1.33	0.80	0.240	(0.097)	0.043	0.197
17	1.42	0.80	0.240	(0.097)	0.043	0.197
18	1.50	0.80	0.240	(0.097)	0.043	0.197
19	1.58	0.80	0.240	(0.097)	0.043	0.197
20	1.67	0.80	0.240	(0.097)	0.043	0.197
21	1.75	0.80	0.240	(0.097)	0.043	0.197
22	1.83	0.80	0.240	(0.097)	0.043	0.197
23	1.92	0.80	0.240	(0.097)	0.043	0.197
24	2.00	0.90	0.270	(0.097)	0.049	0.221
25	2.08	0.80	0.240	(0.097)	0.043	0.197
26	2.17	0.90	0.270	(0.097)	0.049	0.221
27	2.25	0.90	0.270	(0.097)	0.049	0.221
28	2.33	0.90	0.270	(0.097)	0.049	0.221
29	2.42	0.90	0.270	(0.097)	0.049	0.221
30	2.50	0.90	0.270	(0.097)	0.049	0.221
31	2.58	0.90	0.270	(0.097)	0.049	0.221
32	2.67	0.90	0.270	(0.097)	0.049	0.221
33	2.75	1.00	0.300	(0.097)	0.054	0.246
34	2.83	1.00	0.300	(0.097)	0.054	0.246
35	2.92	1.00	0.300	(0.097)	0.054	0.246
36	3.00	1.00	0.300	(0.097)	0.054	0.246
37	3.08	1.00	0.300	(0.097)	0.054	0.246
38	3.17	1.10	0.330	(0.097)	0.059	0.271
39	3.25	1.10	0.330	(0.097)	0.059	0.271
40	3.33	1.10	0.330	(0.097)	0.059	0.271
41	3.42	1.20	0.360	(0.097)	0.065	0.295
42	3.50	1.30	0.390	(0.097)	0.070	0.320
43	3.58	1.40	0.420	(0.097)	0.076	0.344
44	3.67	1.40	0.420	(0.097)	0.076	0.344
45	3.75	1.50	0.450	(0.097)	0.081	0.369
46	3.83	1.50	0.450	(0.097)	0.081	0.369
47	3.92	1.60	0.480	(0.097)	0.086	0.394
48	4.00	1.60	0.480	(0.097)	0.086	0.394
49	4.08	1.70	0.510	(0.097)	0.092	0.418
50	4.17	1.80	0.540	0.097	(0.097)	0.443
51	4.25	1.90	0.570	0.097	(0.103)	0.473
52	4.33	2.00	0.600	0.097	(0.108)	0.503
53	4.42	2.10	0.630	0.097	(0.113)	0.533
54	4.50	2.10	0.630	0.097	(0.113)	0.533
55	4.58	2.20	0.660	0.097	(0.119)	0.563
56	4.67	2.30	0.690	0.097	(0.124)	0.593
57	4.75	2.40	0.720	0.097	(0.130)	0.623
58	4.83	2.40	0.720	0.097	(0.130)	0.623
59	4.92	2.50	0.750	0.097	(0.135)	0.653

60	5.00	2.60	0.780	0.097	(0.140)	0.683
61	5.08	3.10	0.930	0.097	(0.167)	0.833
62	5.17	3.60	1.080	0.097	(0.194)	0.983
63	5.25	3.90	1.170	0.097	(0.211)	1.073
64	5.33	4.20	1.260	0.097	(0.227)	1.163
65	5.42	4.70	1.410	0.097	(0.254)	1.313
66	5.50	5.60	1.680	0.097	(0.302)	1.583
67	5.58	1.90	0.570	0.097	(0.103)	0.473
68	5.67	0.90	0.270	(0.097)	0.049	0.221
69	5.75	0.60	0.180	(0.097)	0.032	0.148
70	5.83	0.50	0.150	(0.097)	0.027	0.123
71	5.92	0.30	0.090	(0.097)	0.016	0.074
72	6.00	0.20	0.060	(0.097)	0.011	0.049

(Loss Rate Not Used)

Sum = 100.0 Sum = 25.6

Flood volume = Effective rainfall 2.14(In)
times area 21.7(Ac.)/[(In)/(Ft.)] = 3.9(Ac.Ft)
Total soil loss = 0.36(In)
Total soil loss = 0.660(Ac.Ft)
Total rainfall = 2.50(In)
Flood volume = 168184.1 Cubic Feet
Total soil loss = 28728.7 Cubic Feet

Peak flow rate of this hydrograph = 29.783(CFS)

++

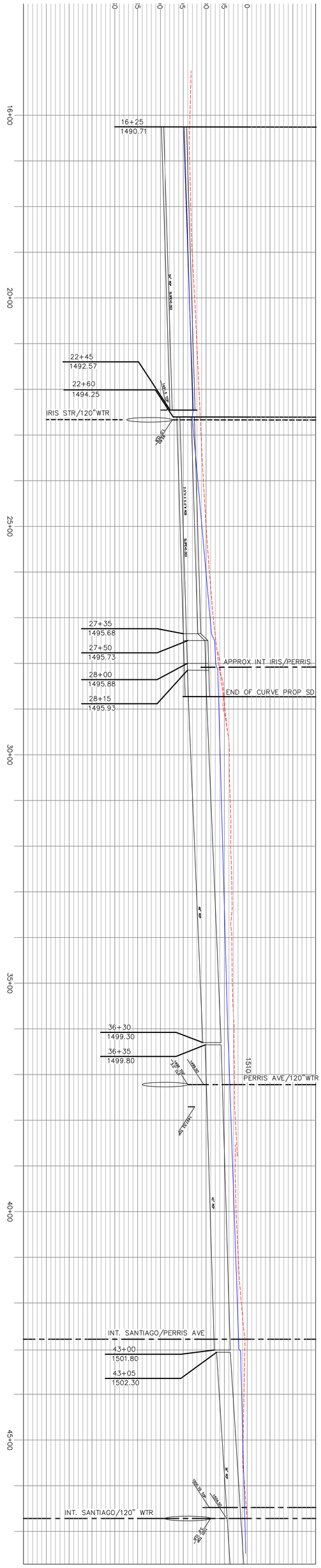
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+ 5       0.0062      0.90  VQ        |         |         |         |
  0+10       0.0224      2.34  V  Q      |         |         |         |
  0+15       0.0423      2.90  V  Q      |         |         |         |
  0+20       0.0635      3.09  V   Q     |         |         |         |
  0+25       0.0854      3.18  V   Q     |         |         |         |
  0+30       0.1089      3.40  |V  Q     |         |         |         |
  0+35       0.1341      3.66  |V  Q     |         |         |         |
  0+40       0.1597      3.72  |V  Q     |         |         |         |
  0+45       0.1855      3.75  |V  Q     |         |         |         |
  0+50       0.2114      3.76  | V  Q    |         |         |         |
  0+55       0.2374      3.77  | V  Q    |         |         |         |
  1+ 0       0.2646      3.95  | V  Q    |         |         |         |
  1+ 5       0.2935      4.20  |  V Q    |         |         |         |
  1+10       0.3228      4.26  |  V Q    |         |         |         |
  1+15       0.3524      4.29  |  V Q    |         |         |         |
  1+20       0.3820      4.30  |  V Q    |         |         |         |
  1+25       0.4116      4.31  |   VQ    |         |         |         |
  1+30       0.4413      4.31  |   VQ    |         |         |         |
  1+35       0.4709      4.31  |   VQ    |         |         |         |
  1+40       0.5006      4.31  |    Q    |         |         |         |
  1+45       0.5302      4.31  |    Q    |         |         |         |
  1+50       0.5599      4.31  |    Q    |         |         |         |
```

```
   1+55       0.5895      4.31  |    QV   |         |         |         |
   2+ 0       0.6204      4.49  |    QV   |         |         |         |
   2+ 5       0.6518      4.56  |     Q   |         |         |         |
   2+10       0.6831      4.55  |     QV  |         |         |         |
   2+15       0.7160      4.76  |     QV  |         |         |         |
   2+20       0.7491      4.81  |     QV  |         |         |         |
   2+25       0.7824      4.83  |     Q V |         |         |         |
   2+30       0.8157      4.84  |     Q V |         |         |         |
   2+35       0.8490      4.84  |     Q V |         |         |         |
   2+40       0.8824      4.84  |     Q  V|         |         |         |
   2+45       0.9170      5.02  |     Q  V|         |         |         |
   2+50       0.9534      5.28  |      Q V|         |         |         |
   2+55       0.9901      5.34  |      Q  V         |         |         |
   3+ 0       1.0270      5.36  |      Q  V         |         |         |
   3+ 5       1.0641      5.38  |      Q  |V        |         |         |
   3+10       1.1024      5.56  |      Q  |V        |         |         |
   3+15       1.1424      5.82  |      Q  |V        |         |         |
   3+20       1.1829      5.87  |      Q  | V       |         |         |
   3+25       1.2248      6.08  |       Q | V       |         |         |
   3+30       1.2697      6.53  |       Q |  V      |         |         |
   3+35       1.3181      7.03  |        Q|  V      |         |         |
   3+40       1.3688      7.36  |        Q|   V     |         |         |
   3+45       1.4215      7.64  |         Q   V     |         |         |
   3+50       1.4762      7.94  |         Q    V    |         |         |
   3+55       1.5326      8.20  |         Q    V    |         |         |
   4+ 0       1.5911      8.49  |         |Q    V   |         |         |
   4+ 5       1.6513      8.74  |         |Q     V  |         |         |
   4+10       1.7147      9.21  |         | Q    V  |         |         |
   4+15       1.7819      9.75  |         |  Q    V |         |         |
   4+20       1.8533     10.37  |         |  Q     V|         |         |
   4+25       1.9291     11.01  |         |   Q    V|         |         |
   4+30       2.0080     11.45  |         |    Q    V         |         |
   4+35       2.0892     11.79  |         |    Q    |V        |         |
   4+40       2.1744     12.38  |         |     Q   | V       |         |
   4+45       2.2640     13.00  |         |      Q  |  V      |         |
   4+50       2.3564     13.42  |         |      Q  |   V     |         |
   4+55       2.4512     13.76  |         |       Q |    V    |         |
   5+ 0       2.5500     14.35  |         |        Q|     V   |         |
   5+ 5       2.6591     15.85  |         |         |Q     V  |         |
   5+10       2.7872     18.60  |         |         |   Q   V |         |
   5+15       2.9333     21.21  |         |         |       Q V         |
   5+20       3.0941     23.34  |         |         |         |QV       |
   5+25       3.2720     25.83  |         |         |         |  VQ     |
   5+30       3.4771     29.78  |         |         |         |     V  Q|
   5+35       3.6490     24.97  |         |         |         |  Q   V  |
   5+40       3.7359     12.62  |         |     Q   |         |       V |
   5+45       3.7854      7.19  |        Q|         |         |        V|
   5+50       3.8174      4.65  |     Q   |         |         |        V|
   5+55       3.8386      3.07  |   Q     |         |         |        V|
   6+ 0       3.8511      1.82  | Q       |         |         |        V|
   6+ 5       3.8576      0.95  |Q        |         |         |        V|
   6+10       3.8597      0.30  Q         |         |         |        V|
   6+15       3.8606      0.12  Q         |         |         |        V|
   6+20       3.8609      0.05  Q         |         |         |        V|
   6+25       3.8610      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
```

Preliminary Profile for Line M2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35+00
40+00
45+00
16+25
1490.71
22+45
1492.57
22+60
1494.25
IRIS STR/120"WTR
27+35
1495.68
27+50
1495.73
28+00
1495.88
28+15
1495.93
APPROX INT IRIS/PERRIS
END OF CURVE PROP SD
36+30
1499.30
36+35
1499.80
1510
PERRIS AVE/120"WTR
INT. SANTIAGO/PERRIS AVE
43+00
1501.80
43+05
1502.30
INT. SANTIAGO/120" WTR

Preliminary WSPG for Line M2

```
T1 Line M2 Storm Drain System - Sunnymead MDP                                  0
T2 Capacity Analysis
T3
SO     65.0001482.900  1                          1487.40
R     100.0001484.710  1      .014                                  .000    .000 0
R     324.0001485.540  1      .014                                  .000    .000 0
JX    329.0001485.560  1  2   .014    7.100         1486.000         45.0         .000
R     825.0001487.400  1      .014                                  .000    .000 0
R     830.0001487.670  1      .014                                  .000    .000 0
R    1000.0001488.300  1      .014                                  .000    .000 0
R    1134.0001488.710  1      .014                                  .000    .000 0
R    1488.3401488.340  1      .014                                  .000    .000 0
R    1609.0001490.140  1      .014                                  .000    .000 0
JX   1617.0001490.690  1  4   .014    7.100         1492.000         45.0         .000
R    1625.0001490.710  1      .014                                  .000    .000 0
R    2245.0001492.570  1      .014                                  .000    .000 0
TS   2260.0001494.250  8      .014                                  .000    .000 0
R    2735.0001495.680  8      .014                                  .000    .000 0
JX   2750.0001495.730  2  6   .014   21.400         1496.000         45.0         .000
R    2800.0001495.880  2      .014                                  .000    .000 0
JX   2815.0001495.930  2  6   .014   19.600         1496.000         45.0         .000
R    3630.0001499.300  2      .014                                  .000    .000 0
JX   3635.0001499.800  3  6   .014   15.300         1499.500         45.0         .000
R    4300.0001501.800  3      .014                                  .000    .000 0
JX   4305.0001502.300  4  5   .014   23.400         1502.000         45.0         .000
R    4748.0001504.960  4      .014                                  .000    .000 0
SH   4748.0001504.960  4                          1504.960
CD   1  4   1    .000   4.500     .000  .000  .000   .00
CD   2  4   1    .000   4.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
CD   5  4   1    .000   2.500     .000  .000  .000   .00
CD   6  4   1    .000   2.000     .000  .000  .000   .00
CD   7  4   1    .000   1.500     .000  .000  .000   .00
CD   8  3   0    .000   2.500    5.000  .000  .000   .00
Q           31.300   .0
```

Program Package Serial Number: 7020

WATER SURFACE PROFILE LISTING Date:11-12-2012 Time:12:33:22

Line M2 Storm Drain System - Sunnymead MDP
Capacity Analysis

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
65.000	1482.900	2.227	1485.127	125.20	15.95	3.95	1489.08	.00	3.29	4.50	4.500	.000	.00	1 .0
6.060	.0517					.0186	.11	2.23	2.13	1.69	.014	.00	.00	PIPE
71.060	1483.213	2.287	1485.501	125.20	15.42	3.69	1489.19	.00	3.29	4.50	4.500	.000	.00	1 .0
7.075	.0517					.0167	.12	2.29	2.02	1.69	.014	.00	.00	PIPE
78.135	1483.579	2.375	1485.955	125.20	14.70	3.36	1489.31	.00	3.29	4.49	4.500	.000	.00	1 .0
5.746	.0517					.0148	.08	2.38	1.88	1.69	.014	.00	.00	PIPE
83.881	1483.876	2.468	1486.344	125.20	14.02	3.05	1489.40	.00	3.29	4.48	4.500	.000	.00	1 .0
4.648	.0517					.0130	.06	2.47	1.75	1.69	.014	.00	.00	PIPE
88.529	1484.117	2.566	1486.682	125.20	13.36	2.77	1489.46	.00	3.29	4.46	4.500	.000	.00	1 .0
3.709	.0517					.0115	.04	2.57	1.62	1.69	.014	.00	.00	PIPE
92.238	1484.308	2.669	1486.977	125.20	12.74	2.52	1489.50	.00	3.29	4.42	4.500	.000	.00	1 .0
2.892	.0517					.0102	.03	2.67	1.51	1.69	.014	.00	.00	PIPE
95.129	1484.458	2.778	1487.236	125.20	12.15	2.29	1489.53	.00	3.29	4.37	4.500	.000	.00	1 .0
2.171	.0517					.0090	.02	2.78	1.40	1.69	.014	.00	.00	PIPE
97.300	1484.570	2.893	1487.464	125.20	11.58	2.08	1489.55	.00	3.29	4.31	4.500	.000	.00	1 .0
1.508	.0517					.0080	.01	2.89	1.29	1.69	.014	.00	.00	PIPE
98.808	1484.648	3.017	1487.665	125.20	11.05	1.89	1489.56	.00	3.29	4.23	4.500	.000	.00	1 .0
.893	.0517					.0071	.01	3.02	1.19	1.69	.014	.00	.00	PIPE

Program Package Serial Number: 7020

WATER SURFACE PROFILE LISTING Date:11-12-2012 Time:12:33:22

Line M2 Storm Drain System - Sunnymead MDP
Capacity Analysis

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
99.701	1484.694	3.149	1487.844	125.20	10.53	1.72	1489.57	.00	3.29	4.12	4.500	.000	.00	1 .0
.299	.0517					.0064	.00	3.15	1.09	1.69	.014	.00	.00	PIPE
100.000	1484.710	3.293	1488.003	125.20	10.04	1.56	1489.57	.00	3.29	3.99	4.500	.000	.00	1 .0
7.001	.0037					.0057	.04	3.29	1.00	4.50	.014	.00	.00	PIPE
107.001	1484.736	3.449	1488.185	125.20	9.57	1.42	1489.61	.00	3.29	3.81	4.500	.000	.00	1 .0
30.878	.0037					.0051	.16	3.45	.91	4.50	.014	.00	.00	PIPE
137.880	1484.850	3.622	1488.473	125.20	9.13	1.29	1489.77	.00	3.29	3.57	4.500	.000	.00	1 .0
83.991	.0037					.0046	.39	3.62	.82	4.50	.014	.00	.00	PIPE
221.870	1485.162	3.819	1488.981	125.20	8.70	1.18	1490.16	.00	3.29	3.22	4.500	.000	.00	1 .0
102.130	.0037					.0043	.44	3.82	.73	4.50	.014	.00	.00	PIPE
324.000	1485.540	3.946	1489.486	125.20	8.47	1.11	1490.60	.00	3.29	2.96	4.500	.000	.00	1 .0
JUNCT STR	.0040					.0039	.02	3.95	.67		.014	.00	.00	PIPE
329.000	1485.560	4.282	1489.842	118.10	7.56	.89	1490.73	.00	3.20	1.93	4.500	.000	.00	1 .0
496.000	.0037					.0036	1.80	4.28	.47	4.02	.014	.00	.00	PIPE
825.000	1487.400	4.223	1491.624	118.10	7.62	.90	1492.52	.00	3.20	2.16	4.500	.000	.00	1 .0
3.744	.0540					.0037	.01	4.22	.50	1.62	.014	.00	.00	PIPE
828.744	1487.602	3.945	1491.547	118.10	7.99	.99	1492.54	.00	3.20	2.96	4.500	.000	.00	1 .0
1.256	.0540					.0039	.00	3.95	.63	1.62	.014	.00	.00	PIPE

Program Package Serial Number: 7020

WATER SURFACE PROFILE LISTING Date:11-12-2012 Time:12:33:22

Line M2 Storm Drain System - Sunnymead MDP
Capacity Analysis

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
830.000	1487.670	3.835	1491.505	118.10	8.18	1.04	1492.54	.00	3.20	3.19	4.500	.000	.00	1 .0
170.000	.0037					.0039	.66	3.84	.68	4.02	.014	.00	.00	PIPE
1000.000	1488.300	3.890	1492.190	118.10	8.08	1.01	1493.20	.00	3.20	3.08	4.500	.000	.00	1 .0
134.000	.0031					.0038	.50	3.89	.65	4.50	.014	.00	.00	PIPE
1134.000	1488.710	4.044	1492.754	118.10	7.84	.95	1493.71	.00	3.20	2.71	4.500	.000	.00	1 .0
30.495	-.0010					.0037	.11	4.04	.59	.00	.014	.00	.00	PIPE
1164.495	1488.678	4.247	1492.925	118.10	7.59	.90	1493.82	.00	3.20	2.07	4.500	.000	.00	1 .0
36.646	-.0010					.0037	.14	4.25	.49	.00	.014	.00	.00	PIPE
1201.142	1488.640	4.459	1493.099	118.10	7.44	.86	1493.96	.00	3.20	.86	4.500	.000	.00	1 .0
7.639	-.0010					.0040	.03	4.46	.30	.00	.014	.00	.00	PIPE
1208.781	1488.632	4.500	1493.132	118.10	7.43	.86	1493.99	.00	3.20	.00	4.500	.000	.00	1 .0
279.559	-.0010					.0042	1.16	4.50	.00	.00	.014	.00	.00	PIPE
1488.340	1488.340	5.961	1494.301	118.10	7.43	.86	1495.16	.00	3.20	.00	4.500	.000	.00	1 .0
120.660	.0149					.0042	.50	5.96	.00	2.33	.014	.00	.00	PIPE
1609.000	1490.140	4.666	1494.806	118.10	7.43	.86	1495.66	.00	3.20	.00	4.500	.000	.00	1 .0
JUNCT STR	.0687					.0037	.03	4.67	.00		.014	.00	.00	PIPE
1617.000	1490.690	4.315	1495.005	111.00	7.08	.78	1495.78	.00	3.10	1.79	4.500	.000	.00	1 .0
8.000	.0025					.0032	.03	4.32	.42	4.50	.014	.00	.00	PIPE

Program Package Serial Number: 7020

WATER SURFACE PROFILE LISTING Date:11-12-2012 Time:12:33:22

Line M2 Storm Drain System - Sunnymead MDP
Capacity Analysis

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1625.000	1490.710	4.322	1495.032	111.00	7.07	.78	1495.81	.00	3.10	1.75	4.500	.000	.00	1 .0
409.938	.0030					.0034	1.39	4.32	.42	4.50	.014	.00	.00	PIPE
2034.938	1491.940	4.500	1496.440	111.00	6.98	.76	1497.20	.00	3.10	.00	4.500	.000	.00	1 .0
210.063	.0030					.0036	.76	4.50	.00	4.50	.014	.00	.00	PIPE
2245.000	1492.570	4.646	1497.216	111.00	6.98	.76	1497.97	.00	3.10	.00	4.500	.000	.00	1 .0
TRANS STR	.1120					.0037	.06	4.65	.00		.014	.00	.00	PIPE
2260.000	1494.250	2.686	1496.936	111.00	8.88	1.22	1498.16	.00	2.48	5.00	2.500	5.000	.00	0 .0
475.000	.0030					.0089	4.24	2.69	.99	2.50	.014	.00	.00	BOX
2735.000	1495.680	5.496	1501.176	111.00	8.88	1.22	1502.40	.00	2.48	5.00	2.500	5.000	.00	0 .0
JUNCT STR	.0033					.0067	.10	5.50	.99		.014	.00	.00	BOX

---------- WARNING - Junction Analysis - Change in Channel Type ----------

2750.000	1495.730	6.150	1501.880	89.60	7.13	.79	1502.67	.00	2.87	.00	4.000	.000	.00	1 .0
50.000	.0030					.0045	.23	6.15	.00	4.00	.014	.00	.00	PIPE
2800.000	1495.880	6.226	1502.106	89.60	7.13	.79	1502.90	.00	2.87	.00	4.000	.000	.00	1 .0
JUNCT STR	.0033					.0036	.05	6.23	.00		.014	.00	.00	PIPE
2815.000	1495.930	6.632	1502.562	70.00	5.57	.48	1503.04	.00	2.53	.00	4.000	.000	.00	1 .0
815.000	.0041					.0028	2.24	6.63	.00	2.75	.014	.00	.00	PIPE

Program Package Serial Number: 7020

WATER SURFACE PROFILE LISTING Date:11-12-2012 Time:12:33:22

Line M2 Storm Drain System - Sunnymead MDP
Capacity Analysis

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
3630.000	1499.300	5.507	1504.807	70.00	5.57	.48	1505.29	.00	2.53	.00	4.000	.000	.00	1 .0
JUNCT STR	.1000					.0031	.02	5.51	.00		.014	.00	.00	PIPE
3635.000	1499.800	5.096	1504.896	54.70	5.69	.50	1505.40	.00	2.31	.00	3.500	.000	.00	1 .0
665.000	.0030					.0034	2.28	5.10	.00	3.16	.014	.00	.00	PIPE
4300.000	1501.800	5.375	1507.175	54.70	5.69	.50	1507.68	.00	2.31	.00	3.500	.000	.00	1 .0
JUNCT STR	.1000					.0030	.01	5.38	.00		.014	.00	.00	PIPE
4305.000	1502.300	5.238	1507.538	31.30	4.43	.30	1507.84	.00	1.81	.00	3.000	.000	.00	1 .0
443.000	.0060					.0026	1.13	5.24	.00	1.77	.014	.00	.00	PIPE
4748.000	1504.960	3.710	1508.670	31.30	4.43	.30	1508.97	.00	1.81	.00	3.000	.000	.00	1 .0

Kimley-Horn
and Associates, Inc.

APPENDIX E

Flood Routing Analysis

FLOOD ROUTING ANALYSIS RESULTS

FREQUENCY	DURATION	DISCHARGE	VOLUMN
(year)	(hour)	(cfs)	(acre-feet)
2	1	20.18	0.69
2	3	12.61	0.97
2	6	9.69	1.11
2	24	2.84	1.48
5	1	30.40	1.09
5	3	18.14	1.48
5	6	14.41	1.69
5	24	4.60	2.22
10	1	34.12	1.23
10	3	20.90	1.74
10	6	17.72	2.11
10	24	6.07	2.89
100	1	53.63	1.99
100	3	31.95	2.82
100	6	27.40	3.50
100	24	9.11	4.82

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
            (Synthetic Unit Hydrograph Version 18.0)
            Release Date: 05/01/2011  License ID 1499

                      Analysis prepared by:


 ************************* DESCRIPTION OF STUDY *************************
* 2 YEAR, 1 HOUR                                                         *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:46 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE     100.00 TO NODE     101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  0.48 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

1	13.994	36.725
2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0206	0.0081	0.0125
2	0.0218	0.0081	0.0137
3	0.0233	0.0081	0.0152
4	0.0258	0.0081	0.0177
5	0.0272	0.0081	0.0191
6	0.0311	0.0081	0.0231
7	0.0368	0.0081	0.0287
8	0.0406	0.0081	0.0325
9	0.0621	0.0081	0.0541
10	0.1338	0.0081	0.1257
11	0.0339	0.0081	0.0259
12	0.0229	0.0081	0.0148

TOTAL STORM RAINFALL(INCHES) = 0.48
TOTAL SOIL-LOSS(INCHES) = 0.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.38

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.1754
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 0.6922

♀
==========

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 7.5 15.0 22.5 30.0
0.083	0.0032	0.46	Q . . . .
0.167	0.0170	2.01	V Q . . . .
0.250	0.0365	2.83	. VQ . . . .
0.333	0.0601	3.42	. VQ . . . .
0.417	0.0878	4.02	. Q . . . .
0.500	0.1196	4.62	. Q . . . .
0.583	0.1576	5.52	. Q V. . . .
0.667	0.2034	6.66	. Q .V . . .
0.750	0.2609	8.34	. .Q V . . .

```
0.833     0.3570    13.96  .          .       Q V        .          .
0.917     0.4960    20.18  .          .          .    Q V .         .
1.000     0.5786    11.99  .          .    Q     .          .  V     .
1.083     0.6265     6.96  .        Q.          .          .     V  .
1.167     0.6517     3.65  .   Q      .          .          .      V .
1.250     0.6667     2.19  . Q        .          .          .       V .
1.333     0.6766     1.43  .Q         .          .          .        V.
1.417     0.6829     0.92  .Q         .          .          .        V.
1.500     0.6866     0.53  Q          .          .          .        V.
1.583     0.6892     0.38  Q          .          .          .        V.
1.667     0.6908     0.24  Q          .          .          .        V.
1.750     0.6917     0.13  Q          .          .          .        V.
1.833     0.6921     0.05  Q          .          .          .        V.
1.917     0.6922     0.01  Q          .          .          .        V.
2.000     0.6922     0.00  Q          .          .          .         V
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	120.0
10%	65.0
20%	40.0
30%	30.0
40%	20.0
50%	15.0
60%	10.0
70%	5.0
80%	5.0
90%	5.0

END OF FLOODSCX ROUTING ANALYSIS

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                      Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 2 YEAR, 3 HOUR                                                        *
*                                                                       *
*                                                                       *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:44 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE     100.00 TO NODE     101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  0.80 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

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UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0104	0.0052	0.0052
2	0.0104	0.0052	0.0052
3	0.0088	0.0044	0.0044
4	0.0120	0.0060	0.0060
5	0.0120	0.0060	0.0060
6	0.0144	0.0072	0.0072
7	0.0120	0.0060	0.0060
8	0.0144	0.0072	0.0072
9	0.0144	0.0072	0.0072
10	0.0120	0.0060	0.0060
11	0.0128	0.0064	0.0064
12	0.0144	0.0072	0.0072
13	0.0176	0.0081	0.0095
14	0.0176	0.0081	0.0095
15	0.0176	0.0081	0.0095
16	0.0160	0.0080	0.0080
17	0.0208	0.0081	0.0127
18	0.0216	0.0081	0.0135
19	0.0192	0.0081	0.0111
20	0.0216	0.0081	0.0135
21	0.0264	0.0081	0.0183
22	0.0248	0.0081	0.0167
23	0.0232	0.0081	0.0151
24	0.0240	0.0081	0.0159
25	0.0248	0.0081	0.0167
26	0.0336	0.0081	0.0255
27	0.0400	0.0081	0.0319
28	0.0280	0.0081	0.0199
29	0.0544	0.0081	0.0463
30	0.0584	0.0081	0.0503
31	0.0656	0.0081	0.0575
32	0.0472	0.0081	0.0391
33	0.0160	0.0080	0.0080
34	0.0144	0.0072	0.0072
35	0.0144	0.0072	0.0072
36	0.0048	0.0024	0.0024

TOTAL STORM RAINFALL(INCHES) = 0.80
TOTAL SOIL-LOSS(INCHES) = 0.26
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.54

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.4709

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 0.9753

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3 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 5.0 10.0 15.0 20.0
0.083	0.0013	0.19	Q
0.167	0.0069	0.81	VQ
0.250	0.0141	1.05	V Q
0.333	0.0218	1.12	V Q
0.417	0.0310	1.33	.VQ
0.500	0.0412	1.48	.VQ
0.583	0.0525	1.64	. VQ
0.667	0.0637	1.63	. VQ
0.750	0.0758	1.75	. Q
0.833	0.0880	1.77	. Q
0.917	0.0995	1.68	. QV
1.000	0.1113	1.71	. QV
1.083	0.1243	1.89	. Q V
1.167	0.1396	2.21	. QV
1.250	0.1557	2.34	. Q V
1.333	0.1719	2.35	. Q V
1.417	0.1882	2.37	. Q V
1.500	0.2082	2.91	. Q V
1.583	0.2299	3.14	. Q V.
1.667	0.2510	3.07	. Q V
1.750	0.2750	3.48	. Q .V
1.833	0.3033	4.11	. Q . V
1.917	0.3319	4.15	. Q . V
2.000	0.3598	4.04	. Q . V
2.083	0.3882	4.13	. Q . V
2.167	0.4198	4.58	. Q. V
2.250	0.4606	5.94	.Q V .
2.333	0.5070	6.73	. Q V
2.417	0.5537	6.78	. Q . V
2.500	0.6208	9.74	. Q. V
2.583	0.7014	11.72	. Q V .
2.667	0.7883	12.61	. Q . V
2.750	0.8572	10.01	. Q V
2.833	0.8965	5.71	.Q . V
2.917	0.9235	3.92	Q . V
3.000	0.9442	3.00	Q . V
3.083	0.9572	1.88	. Q . V.
3.167	0.9644	1.06	. Q . V.
3.250	0.9688	0.63	.Q . V.
3.333	0.9715	0.40	Q . V.
3.417	0.9733	0.26	Q . V.
3.500	0.9744	0.15	Q . V.
3.583	0.9749	0.07	Q . V.
3.667	0.9751	0.04	Q . V.
3.750	0.9752	0.02	Q . V.
3.833	0.9753	0.01	Q . V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have

an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	230.0
10%	165.0
20%	95.0
30%	70.0
40%	40.0
50%	30.0
60%	20.0
70%	20.0
80%	10.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                      Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 2-YEAR, 6 HOUR                                                          *
*                                                                          *
*                                                                          *
 ****************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:49 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.00 INCHES
         RCFC&WCD 6-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
       1                13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0050	0.0025	0.0025
2	0.0060	0.0030	0.0030
3	0.0060	0.0030	0.0030
4	0.0060	0.0030	0.0030
5	0.0060	0.0030	0.0030
6	0.0070	0.0035	0.0035
7	0.0070	0.0035	0.0035
8	0.0070	0.0035	0.0035
9	0.0070	0.0035	0.0035
10	0.0070	0.0035	0.0035
11	0.0070	0.0035	0.0035
12	0.0080	0.0040	0.0040
13	0.0080	0.0040	0.0040
14	0.0080	0.0040	0.0040
15	0.0080	0.0040	0.0040
16	0.0080	0.0040	0.0040
17	0.0080	0.0040	0.0040
18	0.0080	0.0040	0.0040
19	0.0080	0.0040	0.0040
20	0.0080	0.0040	0.0040
21	0.0080	0.0040	0.0040
22	0.0080	0.0040	0.0040
23	0.0080	0.0040	0.0040
24	0.0090	0.0045	0.0045
25	0.0080	0.0040	0.0040
26	0.0090	0.0045	0.0045
27	0.0090	0.0045	0.0045
28	0.0090	0.0045	0.0045
29	0.0090	0.0045	0.0045
30	0.0090	0.0045	0.0045
31	0.0090	0.0045	0.0045
32	0.0090	0.0045	0.0045
33	0.0100	0.0050	0.0050
34	0.0100	0.0050	0.0050
35	0.0100	0.0050	0.0050
36	0.0100	0.0050	0.0050
37	0.0100	0.0050	0.0050
38	0.0110	0.0055	0.0055
39	0.0110	0.0055	0.0055
40	0.0110	0.0055	0.0055
41	0.0120	0.0060	0.0060
42	0.0130	0.0065	0.0065
43	0.0140	0.0070	0.0070

44	0.0140	0.0070	0.0070
45	0.0150	0.0075	0.0075
46	0.0150	0.0075	0.0075
47	0.0160	0.0080	0.0080
48	0.0160	0.0080	0.0080
49	0.0170	0.0081	0.0089
50	0.0180	0.0081	0.0099
51	0.0190	0.0081	0.0109
52	0.0200	0.0081	0.0119
53	0.0210	0.0081	0.0129
54	0.0210	0.0081	0.0129
55	0.0220	0.0081	0.0139
56	0.0230	0.0081	0.0149
57	0.0240	0.0081	0.0159
58	0.0240	0.0081	0.0159
59	0.0250	0.0081	0.0169
60	0.0260	0.0081	0.0179
61	0.0310	0.0081	0.0229
62	0.0360	0.0081	0.0279
63	0.0390	0.0081	0.0309
64	0.0420	0.0081	0.0339
65	0.0470	0.0081	0.0389
66	0.0560	0.0081	0.0479
67	0.0190	0.0081	0.0109
68	0.0090	0.0045	0.0045
69	0.0060	0.0030	0.0030
70	0.0050	0.0025	0.0025
71	0.0030	0.0015	0.0015
72	0.0020	0.0010	0.0010

TOTAL STORM RAINFALL(INCHES) = 1.00
TOTAL SOIL-LOSS(INCHES) = 0.39
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.61

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.7027
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.1051

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6 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0006	0.09	Q	.	.	.	.
0.167	0.0035	0.41	VQ	.	.	.	.
0.250	0.0076	0.60	V Q	.	.	.	.
0.333	0.0122	0.67	V Q	.	.	.	.
0.417	0.0171	0.71	V Q	.	.	.	.
0.500	0.0223	0.76	V Q	.	.	.	.
0.583	0.0281	0.84	.V Q	.	.	.	.
0.667	0.0341	0.87	.V Q	.	.	.	.
0.750	0.0402	0.89	.V Q	.	.	.	.
0.833	0.0464	0.90	.V Q	.	.	.	.
0.917	0.0527	0.91	.V Q	.	.	.	.
1.000	0.0591	0.93	. VQ	.	.	.	.
1.083	0.0660	0.99	. VQ	.	.	.	.

1.167	0.0730	1.02	. V Q . . . .
1.250	0.0801	1.03	. V Q . . . .
1.333	0.0872	1.04	. VQ . . . .
1.417	0.0944	1.04	. VQ . . . .
1.500	0.1016	1.05	. VQ . . . .
1.583	0.1088	1.05	. VQ . . . .
1.667	0.1160	1.05	. Q . . . .
1.750	0.1233	1.05	. Q . . . .
1.833	0.1305	1.05	. Q . . . .
1.917	0.1377	1.05	. Q . . . .
2.000	0.1451	1.07	. QV . . . .
2.083	0.1527	1.11	. QV . . . .
2.167	0.1603	1.09	. QV . . . .
2.250	0.1681	1.14	. Q V . . . .
2.333	0.1761	1.16	. Q V . . . .
2.417	0.1841	1.17	. Q V . . . .
2.500	0.1922	1.17	. Q V . . . .
2.583	0.2003	1.18	. Q V . . . .
2.667	0.2084	1.18	. Q V . . . .
2.750	0.2166	1.20	. Q V . . . .
2.833	0.2253	1.26	. Q V . . . .
2.917	0.2341	1.28	. Q V . . . .
3.000	0.2431	1.29	. Q V . . . .
3.083	0.2520	1.30	. Q V. . . . .
3.167	0.2611	1.32	. Q V. . . . .
3.250	0.2707	1.39	. Q V. . . . .
3.333	0.2804	1.41	. Q V . . . .
3.417	0.2904	1.44	. Q V . . . .
3.500	0.3009	1.53	. Q V . . . .
3.583	0.3121	1.64	. Q .V . . . .
3.667	0.3241	1.73	. Q .V . . . .
3.750	0.3365	1.80	. Q . V . . . .
3.833	0.3494	1.88	. Q . V . . . .
3.917	0.3627	1.94	. Q . V . . . .
4.000	0.3766	2.01	. Q . V . . . .
4.083	0.3910	2.09	. Q . V . . . .
4.167	0.4064	2.25	. Q . V . . . .
4.250	0.4234	2.46	. Q. V . . . .
4.333	0.4420	2.70	. Q V . . . .
4.417	0.4622	2.94	. .Q V . . . .
4.500	0.4840	3.15	. . Q V . . . .
4.583	0.5066	3.29	. . Q V . . . .
4.667	0.5307	3.50	. . Q V. . . . .
4.750	0.5564	3.74	. . Q V . . . .
4.833	0.5836	3.95	. . Q .V . . . .
4.917	0.6117	4.08	. . Q . V . . . .
5.000	0.6412	4.29	. . Q . V . . . .
5.083	0.6734	4.67	. . Q . V . . . .
5.167	0.7116	5.55	. . . Q V . . . .
5.250	0.7568	6.55	. . . QV . . . .
5.333	0.8078	7.41	. . . Q. . . . .
5.417	0.8648	8.28	. . . .V Q . . . .
5.500	0.9305	9.54	. . . . V . Q . . .
5.583	0.9973	9.69	. . . . V Q . . .
5.667	1.0364	5.69	. . . Q . V . . .
5.750	1.0593	3.32	. . Q . . . V . . .
5.833	1.0747	2.23	. Q . . . . V . . .
5.917	1.0857	1.60	. Q . . . . V. . .
6.000	1.0933	1.11	. Q . . . . V. . .
6.083	1.0984	0.73	. Q . . . . V. . .
6.167	1.1011	0.40	.Q . . . . V. . .
6.250	1.1029	0.25	.Q . . . . V. . .
6.333	1.1040	0.16	Q . . . . V. . .

6.417	1.1045	0.08	Q	.	.	.	V.
6.500	1.1048	0.04	Q	.	.	.	V.
6.583	1.1049	0.02	Q	.	.	.	V.
6.667	1.1050	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	400.0
10%	300.0
20%	115.0
30%	85.0
40%	55.0
50%	35.0
60%	25.0
70%	20.0
80%	15.0
90%	10.0

END OF FLOODSCX ROUTING ANALYSIS

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
          (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
             Release Date: 05/01/2011  License ID 1499

                     Analysis prepared by:


 ************************* DESCRIPTION OF STUDY **************************
 * 2-YEAR, 24 HOUR                                                       *
 *                                                                       *
 *                                                                       *
 *************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:52 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE     100.00 TO NODE     101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.049
         USER-ENTERED RAINFALL =  1.60 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 250.000


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

1	50.817	44.454
2	90.903	35.066
3	97.798	6.031
4	99.444	1.441
5	99.778	0.292
6	99.944	0.146
7	100.000	0.049

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0032	0.0016	0.0016
2	0.0048	0.0024	0.0024
3	0.0048	0.0024	0.0024
4	0.0064	0.0032	0.0032
5	0.0048	0.0024	0.0024
6	0.0048	0.0024	0.0024
7	0.0048	0.0024	0.0024
8	0.0064	0.0032	0.0032
9	0.0064	0.0032	0.0032
10	0.0064	0.0032	0.0032
11	0.0080	0.0040	0.0040
12	0.0080	0.0040	0.0040
13	0.0080	0.0040	0.0040
14	0.0080	0.0040	0.0040
15	0.0080	0.0040	0.0040
16	0.0096	0.0048	0.0048
17	0.0096	0.0048	0.0048
18	0.0112	0.0056	0.0056
19	0.0112	0.0056	0.0056
20	0.0128	0.0064	0.0064
21	0.0096	0.0048	0.0048
22	0.0112	0.0056	0.0056
23	0.0128	0.0064	0.0064
24	0.0128	0.0064	0.0064
25	0.0144	0.0072	0.0072
26	0.0144	0.0072	0.0072
27	0.0160	0.0080	0.0080
28	0.0160	0.0080	0.0080
29	0.0160	0.0080	0.0080
30	0.0176	0.0088	0.0088
31	0.0192	0.0096	0.0096
32	0.0208	0.0104	0.0104
33	0.0240	0.0120	0.0120
34	0.0240	0.0120	0.0120
35	0.0256	0.0128	0.0128
36	0.0272	0.0136	0.0136
37	0.0304	0.0152	0.0152
38	0.0320	0.0160	0.0160
39	0.0336	0.0168	0.0168
40	0.0352	0.0176	0.0176
41	0.0240	0.0120	0.0120
42	0.0240	0.0120	0.0120
43	0.0320	0.0160	0.0160
44	0.0320	0.0160	0.0160
45	0.0304	0.0152	0.0152
46	0.0304	0.0152	0.0152
47	0.0272	0.0136	0.0136
48	0.0288	0.0144	0.0144

49	0.0400	0.0200	0.0200
50	0.0416	0.0208	0.0208
51	0.0448	0.0219	0.0229
52	0.0464	0.0216	0.0248
53	0.0544	0.0212	0.0332
54	0.0544	0.0209	0.0335
55	0.0368	0.0184	0.0184
56	0.0368	0.0184	0.0184
57	0.0432	0.0200	0.0232
58	0.0416	0.0197	0.0219
59	0.0416	0.0194	0.0222
60	0.0400	0.0191	0.0209
61	0.0384	0.0188	0.0196
62	0.0368	0.0184	0.0184
63	0.0304	0.0152	0.0152
64	0.0304	0.0152	0.0152
65	0.0064	0.0032	0.0032
66	0.0064	0.0032	0.0032
67	0.0048	0.0024	0.0024
68	0.0048	0.0024	0.0024
69	0.0080	0.0040	0.0040
70	0.0080	0.0040	0.0040
71	0.0080	0.0040	0.0040
72	0.0064	0.0032	0.0032
73	0.0064	0.0032	0.0032
74	0.0064	0.0032	0.0032
75	0.0048	0.0024	0.0024
76	0.0032	0.0016	0.0016
77	0.0048	0.0024	0.0024
78	0.0064	0.0032	0.0032
79	0.0048	0.0024	0.0024
80	0.0032	0.0016	0.0016
81	0.0048	0.0024	0.0024
82	0.0048	0.0024	0.0024
83	0.0048	0.0024	0.0024
84	0.0032	0.0016	0.0016
85	0.0048	0.0024	0.0024
86	0.0032	0.0016	0.0016
87	0.0048	0.0024	0.0024
88	0.0032	0.0016	0.0016
89	0.0048	0.0024	0.0024
90	0.0032	0.0016	0.0016
91	0.0032	0.0016	0.0016
92	0.0032	0.0016	0.0016
93	0.0032	0.0016	0.0016
94	0.0032	0.0016	0.0016
95	0.0032	0.0016	0.0016
96	0.0032	0.0016	0.0016

TOTAL STORM RAINFALL(INCHES) = 1.60
TOTAL SOIL-LOSS(INCHES) = 0.78
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.82

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.4107
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.4819

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0005	0.07	Q	.	.	.	.
0.167	0.0010	0.07	Q	.	.	.	.
0.250	0.0015	0.07	Q	.	.	.	.
0.333	0.0026	0.16	Q	.	.	.	.
0.417	0.0037	0.16	Q	.	.	.	.
0.500	0.0048	0.16	Q	.	.	.	.
0.583	0.0062	0.20	Q	.	.	.	.
0.667	0.0076	0.20	Q	.	.	.	.
0.750	0.0090	0.20	Q	.	.	.	.
0.833	0.0107	0.24	Q	.	.	.	.
0.917	0.0123	0.24	Q	.	.	.	.
1.000	0.0140	0.24	Q	.	.	.	.
1.083	0.0156	0.24	Q	.	.	.	.
1.167	0.0173	0.24	Q	.	.	.	.
1.250	0.0189	0.24	Q	.	.	.	.
1.333	0.0204	0.21	Q	.	.	.	.
1.417	0.0219	0.21	Q	.	.	.	.
1.500	0.0233	0.21	Q	.	.	.	.
1.583	0.0248	0.21	Q	.	.	.	.
1.667	0.0262	0.21	Q	.	.	.	.
1.750	0.0277	0.21	Q	.	.	.	.
1.833	0.0294	0.25	Q	.	.	.	.
1.917	0.0311	0.25	Q	.	.	.	.
2.000	0.0328	0.25	Q	.	.	.	.
2.083	0.0347	0.27	VQ	.	.	.	.
2.167	0.0365	0.27	VQ	.	.	.	.
2.250	0.0384	0.27	Q	.	.	.	.
2.333	0.0403	0.28	.Q	.	.	.	.
2.417	0.0423	0.28	.Q	.	.	.	.
2.500	0.0442	0.28	.Q	.	.	.	.
2.583	0.0464	0.32	.Q	.	.	.	.
2.667	0.0485	0.32	.Q	.	.	.	.
2.750	0.0507	0.32	.Q	.	.	.	.
2.833	0.0531	0.34	.Q	.	.	.	.
2.917	0.0554	0.34	.Q	.	.	.	.
3.000	0.0578	0.34	.Q	.	.	.	.
3.083	0.0602	0.35	.Q	.	.	.	.
3.167	0.0626	0.35	.Q	.	.	.	.
3.250	0.0650	0.35	.Q	.	.	.	.
3.333	0.0674	0.35	.Q	.	.	.	.
3.417	0.0698	0.35	.Q	.	.	.	.
3.500	0.0722	0.35	.Q	.	.	.	.
3.583	0.0746	0.35	.QV	.	.	.	.
3.667	0.0770	0.35	.QV	.	.	.	.
3.750	0.0794	0.35	.QV	.	.	.	.
3.833	0.0821	0.39	.QV	.	.	.	.
3.917	0.0847	0.39	.QV	.	.	.	.
4.000	0.0874	0.39	.QV	.	.	.	.
4.083	0.0902	0.41	.QV	.	.	.	.
4.167	0.0931	0.41	.QV	.	.	.	.
4.250	0.0959	0.41	.QV	.	.	.	.
4.333	0.0991	0.45	.QV	.	.	.	.
4.417	0.1022	0.45	.QV	.	.	.	.
4.500	0.1053	0.45	.QV	.	.	.	.
4.583	0.1086	0.48	.QV	.	.	.	.
4.667	0.1120	0.48	.Q V	.	.	.	.
4.750	0.1153	0.48	.Q V	.	.	.	.

4.833	0.1189	0.52	. QV . . . .
4.917	0.1225	0.52	. QV . . . .
5.000	0.1261	0.52	. QV . . . .
5.083	0.1294	0.48	.Q V . . . .
5.167	0.1328	0.48	.Q V . . . .
5.250	0.1361	0.48	.Q V . . . .
5.333	0.1393	0.47	.Q V . . . .
5.417	0.1425	0.47	.Q V . . . .
5.500	0.1457	0.47	.Q V . . . .
5.583	0.1493	0.52	. Q V . . . .
5.667	0.1529	0.52	. Q V . . . .
5.750	0.1565	0.52	. Q V . . . .
5.833	0.1603	0.55	. Q V . . . .
5.917	0.1641	0.55	. Q V . . . .
6.000	0.1679	0.55	. Q V . . . .
6.083	0.1720	0.59	. Q V . . . .
6.167	0.1761	0.59	. Q V . . . .
6.250	0.1802	0.59	. Q V . . . .
6.333	0.1845	0.62	. Q V . . . .
6.417	0.1888	0.62	. Q V . . . .
6.500	0.1931	0.62	. Q V . . . .
6.583	0.1976	0.66	. Q V . . . .
6.667	0.2022	0.66	. Q V . . . .
6.750	0.2068	0.66	. Q V . . . .
6.833	0.2115	0.69	. Q V . . . .
6.917	0.2163	0.69	. Q V . . . .
7.000	0.2211	0.69	. Q V . . . .
7.083	0.2259	0.70	. Q V . . . .
7.167	0.2307	0.70	. Q V . . . .
7.250	0.2355	0.70	. Q V . . . .
7.333	0.2406	0.73	. Q V . . . .
7.417	0.2456	0.73	. Q V . . . .
7.500	0.2507	0.73	. Q V . . . .
7.583	0.2562	0.80	. Q V . . . .
7.667	0.2617	0.80	. Q V . . . .
7.750	0.2672	0.80	. Q V . . . .
7.833	0.2732	0.87	. Q V . . . .
7.917	0.2791	0.87	. Q V . . . .
8.000	0.2851	0.87	. Q V . . . .
8.083	0.2918	0.97	. Q V . . . .
8.167	0.2985	0.97	. Q V . . . .
8.250	0.3052	0.97	. Q V . . . .
8.333	0.3123	1.03	. Q V . . . .
8.417	0.3195	1.03	. Q V . . . .
8.500	0.3266	1.03	. Q V . . . .
8.583	0.3340	1.08	. Q V. . . . .
8.667	0.3415	1.08	. Q V. . . . .
8.750	0.3489	1.08	. Q V. . . . .
8.833	0.3569	1.15	. Q V. . . . .
8.917	0.3648	1.15	. Q V. . . . .
9.000	0.3727	1.15	. Q V . . . .
9.083	0.3813	1.25	. Q V . . . .
9.167	0.3899	1.25	. Q V . . . .
9.250	0.3985	1.25	. Q V . . . .
9.333	0.4078	1.35	. Q .V . . . .
9.417	0.4171	1.35	. Q .V . . . .
9.500	0.4264	1.35	. Q .V . . . .
9.583	0.4363	1.43	. Q .V . . . .
9.667	0.4461	1.43	. Q . V . . . .
9.750	0.4559	1.43	. Q . V . . . .
9.833	0.4662	1.50	. Q . V . . . .
9.917	0.4765	1.50	. Q . V . . . .
10.000	0.4868	1.50	. Q . V . . . .

10.083	0.4956	1.28	. Q . V . . .
10.167	0.5045	1.28	. Q . V . . .
10.250	0.5133	1.28	. Q . V . . .
10.333	0.5208	1.09	. Q . V . . .
10.417	0.5283	1.09	. Q . V . . .
10.500	0.5359	1.09	. Q . V . . .
10.583	0.5444	1.24	. Q . V . . .
10.667	0.5529	1.24	. Q . V . . .
10.750	0.5614	1.24	. Q . V . . .
10.833	0.5709	1.37	. Q . V . . .
10.917	0.5803	1.37	. Q . V . . .
11.000	0.5897	1.37	. Q . V . . .
11.083	0.5991	1.36	. Q . V . . .
11.167	0.6084	1.36	. Q . V . . .
11.250	0.6178	1.36	. Q . V . . .
11.333	0.6270	1.33	. Q . V . . .
11.417	0.6362	1.33	. Q . V . . .
11.500	0.6454	1.33	. Q . V . . .
11.583	0.6540	1.26	. Q . V . . .
11.667	0.6627	1.26	. Q . V . . .
11.750	0.6714	1.26	. Q . V . . .
11.833	0.6799	1.24	. Q . V . . .
11.917	0.6884	1.24	. Q . V . . .
12.000	0.6970	1.24	. Q . V . . .
12.083	0.7073	1.51	. Q . V. . .
12.167	0.7177	1.51	. Q . V. . .
12.250	0.7281	1.51	. Q . V. . .
12.333	0.7401	1.74	. Q . V. . .
12.417	0.7520	1.74	. Q . V . . .
12.500	0.7640	1.74	. Q . V . . .
12.583	0.7771	1.90	. Q . V . . .
12.667	0.7901	1.90	. Q . V . . .
12.750	0.8032	1.90	. Q . V . . .
12.833	0.8175	2.07	. Q . . V . . .
12.917	0.8317	2.07	. Q . . V . . .
13.000	0.8460	2.07	. Q . . V . . .
13.083	0.8633	2.52	. Q . V . . .
13.167	0.8807	2.52	. Q . V . . .
13.250	0.8981	2.52	. Q . V . . .
13.333	0.9177	2.84	. .Q . V . . .
13.417	0.9373	2.84	. .Q . V . . .
13.500	0.9569	2.84	. .Q . V . . .
13.583	0.9723	2.24	. Q . . V . . .
13.667	0.9877	2.24	. Q . . V . . .
13.750	1.0031	2.24	. Q . . V . . .
13.833	1.0150	1.72	. Q . . V . . .
13.917	1.0269	1.72	. Q . . V . . .
14.000	1.0387	1.72	. Q . . V . . .
14.083	1.0515	1.85	. Q . . V . . .
14.167	1.0642	1.85	. Q . . V . . .
14.250	1.0770	1.85	. Q . . V. . .
14.333	1.0904	1.94	. Q . . V. . .
14.417	1.1037	1.94	. Q . . V. . .
14.500	1.1171	1.94	. Q . . V . . .
14.583	1.1304	1.93	. Q . . V . . .
14.667	1.1438	1.93	. Q . . V . . .
14.750	1.1571	1.93	. Q . . V . . .
14.833	1.1701	1.88	. Q . . .V . . .
14.917	1.1830	1.88	. Q . . .V . . .
15.000	1.1960	1.88	. Q . . . V . . .
15.083	1.2083	1.78	. Q . . . V . . .
15.167	1.2205	1.78	. Q . . . V . . .
15.250	1.2328	1.78	. Q . . . . V . . .

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15.333    1.2443    1.67  .     Q   .         .         .  V       .
15.417    1.2558    1.67  .     Q   .         .         .  V       .
15.500    1.2674    1.67  .     Q   .         .         .   V      .
15.583    1.2776    1.48  .    Q    .         .         .   V      .
15.667    1.2878    1.48  .    Q    .         .         .   V      .
15.750    1.2979    1.48  .    Q    .         .         .    V     .
15.833    1.3073    1.36  .    Q    .         .         .    V     .
15.917    1.3167    1.36  .    Q    .         .         .    V     .
16.000    1.3260    1.36  .    Q    .         .         .    V     .
16.083    1.3315    0.80  .  Q      .         .         .    V     .
16.167    1.3371    0.80  .  Q      .         .         .     V    .
16.250    1.3426    0.80  .  Q      .         .         .     V    .
16.333    1.3452    0.38  .Q       .         .         .     V    .
16.417    1.3478    0.38  .Q       .         .         .     V    .
16.500    1.3504    0.38  .Q       .         .         .     V    .
16.583    1.3522    0.27  .Q       .         .         .     V    .
16.667    1.3541    0.27  .Q       .         .         .     V    .
16.750    1.3559    0.27  .Q       .         .         .     V    .
16.833    1.3575    0.22  Q        .         .         .     V    .
16.917    1.3590    0.22  Q        .         .         .     V    .
17.000    1.3605    0.22  Q        .         .         .     V    .
17.083    1.3625    0.28  .Q       .         .         .     V    .
17.167    1.3645    0.28  .Q       .         .         .     V    .
17.250    1.3664    0.28  .Q       .         .         .     V    .
17.333    1.3688    0.34  .Q       .         .         .     V    .
17.417    1.3711    0.34  .Q       .         .         .      V   .
17.500    1.3734    0.34  .Q       .         .         .      V   .
17.583    1.3758    0.35  .Q       .         .         .      V   .
17.667    1.3782    0.35  .Q       .         .         .      V   .
17.750    1.3806    0.35  .Q       .         .         .      V   .
17.833    1.3827    0.31  .Q       .         .         .      V   .
17.917    1.3849    0.31  .Q       .         .         .      V   .
18.000    1.3871    0.31  .Q       .         .         .      V   .
18.083    1.3890    0.29  .Q       .         .         .      V   .
18.167    1.3910    0.29  .Q       .         .         .      V   .
18.250    1.3930    0.29  .Q       .         .         .      V   .
18.333    1.3949    0.28  .Q       .         .         .      V   .
18.417    1.3968    0.28  .Q       .         .         .      V   .
18.500    1.3988    0.28  .Q       .         .         .      V   .
18.583    1.4005    0.24  Q        .         .         .      V   .
18.667    1.4022    0.24  Q        .         .         .      V   .
18.750    1.4038    0.24  Q        .         .         .      V   .
18.833    1.4051    0.18  Q        .         .         .      V   .
18.917    1.4063    0.18  Q        .         .         .      V   .
19.000    1.4076    0.18  Q        .         .         .      V   .
19.083    1.4088    0.18  Q        .         .         .       V  .
19.167    1.4101    0.18  Q        .         .         .       V  .
19.250    1.4114    0.18  Q        .         .         .       V  .
19.333    1.4130    0.24  Q        .         .         .       V  .
19.417    1.4147    0.24  Q        .         .         .       V  .
19.500    1.4163    0.24  Q        .         .         .       V  .
19.583    1.4180    0.24  Q        .         .         .       V  .
19.667    1.4196    0.24  Q        .         .         .       V  .
19.750    1.4212    0.24  Q        .         .         .       V  .
19.833    1.4225    0.18  Q        .         .         .       V  .
19.917    1.4237    0.18  Q        .         .         .       V  .
20.000    1.4249    0.18  Q        .         .         .       V  .
20.083    1.4262    0.18  Q        .         .         .       V  .
20.167    1.4275    0.18  Q        .         .         .       V  .
20.250    1.4287    0.18  Q        .         .         .       V  .
20.333    1.4301    0.21  Q        .         .         .       V  .
20.417    1.4315    0.21  Q        .         .         .       V  .
20.500    1.4330    0.21  Q        .         .         .       V  .
```

20.583	1.4344	0.21	Q	.	.	.	V .
20.667	1.4358	0.21	Q	.	.	.	V .
20.750	1.4373	0.21	Q	.	.	.	V .
20.833	1.4385	0.17	Q	.	.	.	V .
20.917	1.4397	0.17	Q	.	.	.	V .
21.000	1.4409	0.17	Q	.	.	.	V .
21.083	1.4421	0.18	Q	.	.	.	V .
21.167	1.4434	0.18	Q	.	.	.	V .
21.250	1.4446	0.18	Q	.	.	.	V .
21.333	1.4458	0.17	Q	.	.	.	V.
21.417	1.4470	0.17	Q	.	.	.	V.
21.500	1.4481	0.17	Q	.	.	.	V.
21.583	1.4494	0.18	Q	.	.	.	V.
21.667	1.4506	0.18	Q	.	.	.	V.
21.750	1.4519	0.18	Q	.	.	.	V.
21.833	1.4530	0.17	Q	.	.	.	V.
21.917	1.4542	0.17	Q	.	.	.	V.
22.000	1.4554	0.17	Q	.	.	.	V.
22.083	1.4566	0.18	Q	.	.	.	V.
22.167	1.4579	0.18	Q	.	.	.	V.
22.250	1.4591	0.18	Q	.	.	.	V.
22.333	1.4603	0.17	Q	.	.	.	V.
22.417	1.4614	0.17	Q	.	.	.	V.
22.500	1.4626	0.17	Q	.	.	.	V.
22.583	1.4636	0.15	Q	.	.	.	V.
22.667	1.4646	0.15	Q	.	.	.	V.
22.750	1.4656	0.15	Q	.	.	.	V.
22.833	1.4666	0.14	Q	.	.	.	V.
22.917	1.4675	0.14	Q	.	.	.	V.
23.000	1.4685	0.14	Q	.	.	.	V.
23.083	1.4695	0.14	Q	.	.	.	V.
23.166	1.4704	0.14	Q	.	.	.	V.
23.250	1.4714	0.14	Q	.	.	.	V.
23.333	1.4724	0.14	Q	.	.	.	V.
23.416	1.4733	0.14	Q	.	.	.	V.
23.500	1.4743	0.14	Q	.	.	.	V.
23.583	1.4753	0.14	Q	.	.	.	V.
23.666	1.4762	0.14	Q	.	.	.	V.
23.750	1.4772	0.14	Q	.	.	.	V.
23.833	1.4782	0.14	Q	.	.	.	V.
23.916	1.4791	0.14	Q	.	.	.	V.
24.000	1.4801	0.14	Q	.	.	.	V.
24.083	1.4806	0.07	Q	.	.	.	V.
24.166	1.4810	0.07	Q	.	.	.	V.
24.250	1.4815	0.07	Q	.	.	.	V.
24.333	1.4816	0.01	Q	.	.	.	V.
24.416	1.4817	0.01	Q	.	.	.	V.
24.500	1.4818	0.01	Q	.	.	.	V.
24.583	1.4818	0.00	Q	.	.	.	V.
24.666	1.4818	0.00	Q	.	.	.	V.
24.750	1.4818	0.00	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1485.0
10%	915.0
20%	615.0
30%	495.0

	F2Y24H.RES
40%	420.0
50%	255.0
60%	180.0
70%	60.0
80%	30.0
90%	15.0

END OF FLOODSCx ROUTING ANALYSIS

5-YEAR FREQUENCY

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                      Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 5-YEAR, 1 HOUR                                                        *
*                                                                       *
*                                                                       *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:27 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  0.70 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

1	13.994	36.725
2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0301	0.0081	0.0220
2	0.0318	0.0081	0.0237
3	0.0339	0.0081	0.0258
4	0.0376	0.0081	0.0295
5	0.0397	0.0081	0.0316
6	0.0454	0.0081	0.0373
7	0.0537	0.0081	0.0456
8	0.0592	0.0081	0.0511
9	0.0906	0.0081	0.0826
10	0.1951	0.0081	0.1871
11	0.0495	0.0081	0.0414
12	0.0333	0.0081	0.0253

TOTAL STORM RAINFALL(INCHES) = 0.70
TOTAL SOIL-LOSS(INCHES) = 0.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.60

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.1754
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.0899

♀
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1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 10.0 20.0 30.0 40.0
0.083	0.0056	0.81	Q . . . .
0.167	0.0297	3.51	.V Q . . . .
0.250	0.0635	4.90	. V Q . . . .
0.333	0.1036	5.83	. V Q . . . .
0.417	0.1502	6.76	. VQ . . . .
0.500	0.2029	7.65	. Q . . . .
0.583	0.2647	8.99	. QV. . . .
0.667	0.3382	10.66	. Q V . . .
0.750	0.4285	13.12	. . Q V . . .

```
0.833     0.5754    21.33  .          .          .Q         .          .
0.917     0.7848    30.40  .          .          .       V Q           .
1.000     0.9120    18.46  .          .       Q  .          .  V       .
1.083     0.9876    10.98  .          Q          .          .     V    .
1.167     1.0269     5.71  .     Q    .          .          .      V   .
1.250     1.0503     3.39  .   Q      .          .          .       V  .
1.333     1.0656     2.22  . Q        .          .          .        V.
1.417     1.0754     1.42  .Q         .          .          .        V.
1.500     1.0811     0.83  Q          .          .          .        V.
1.583     1.0851     0.58  Q          .          .          .        V.
1.667     1.0877     0.37  Q          .          .          .        V.
1.750     1.0891     0.21  Q          .          .          .        V.
1.833     1.0897     0.09  Q          .          .          .        V.
1.917     1.0898     0.02  Q          .          .          .        V.
2.000     1.0899     0.00  Q          .          .          .        V.
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	120.0
10%	70.0
20%	45.0
30%	30.0
40%	20.0
50%	15.0
60%	15.0
70%	10.0
80%	5.0
90%	5.0

END OF FLOODSCX ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
          (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                (Synthetic Unit Hydrograph Version 18.0)
                Release Date: 05/01/2011  License ID 1499

                         Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 5-YEAR, 3 HOUR                                                          *
*                                                                          *
*                                                                          *
 ****************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:25 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.10 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1               13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0143	0.0071	0.0071
2	0.0143	0.0071	0.0071
3	0.0121	0.0060	0.0060
4	0.0165	0.0081	0.0084
5	0.0165	0.0081	0.0084
6	0.0198	0.0081	0.0117
7	0.0165	0.0081	0.0084
8	0.0198	0.0081	0.0117
9	0.0198	0.0081	0.0117
10	0.0165	0.0081	0.0084
11	0.0176	0.0081	0.0095
12	0.0198	0.0081	0.0117
13	0.0242	0.0081	0.0161
14	0.0242	0.0081	0.0161
15	0.0242	0.0081	0.0161
16	0.0220	0.0081	0.0139
17	0.0286	0.0081	0.0205
18	0.0297	0.0081	0.0216
19	0.0264	0.0081	0.0183
20	0.0297	0.0081	0.0216
21	0.0363	0.0081	0.0282
22	0.0341	0.0081	0.0260
23	0.0319	0.0081	0.0238
24	0.0330	0.0081	0.0249
25	0.0341	0.0081	0.0260
26	0.0462	0.0081	0.0381
27	0.0550	0.0081	0.0469
28	0.0385	0.0081	0.0304
29	0.0748	0.0081	0.0667
30	0.0803	0.0081	0.0722
31	0.0902	0.0081	0.0821
32	0.0649	0.0081	0.0568
33	0.0220	0.0081	0.0139
34	0.0198	0.0081	0.0117
35	0.0198	0.0081	0.0117
36	0.0066	0.0033	0.0033

TOTAL STORM RAINFALL(INCHES) = 1.10
TOTAL SOIL-LOSS(INCHES) = 0.28
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.82

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.5105

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.4779

♀

3 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 5.0 10.0 15.0 20.0
0.083	0.0018	0.26	Q
0.167	0.0095	1.12	V Q
0.250	0.0194	1.44	V Q
0.333	0.0300	1.54	V Q
0.417	0.0428	1.86	.V Q
0.500	0.0575	2.13	.V Q
0.583	0.0747	2.48	. V Q
0.667	0.0913	2.42	. V Q
0.750	0.1102	2.75	. V Q
0.833	0.1294	2.78	. V Q
0.917	0.1466	2.50	. VQ
1.000	0.1644	2.58	. VQ
1.083	0.1852	3.02	. VQ
1.167	0.2103	3.65	. V Q
1.250	0.2373	3.92	. VQ
1.333	0.2645	3.95	. Q
1.417	0.2921	4.00	. Q
1.500	0.3249	4.77	. VQ.
1.583	0.3600	5.10	. VQ
1.667	0.3945	5.01	. Q
1.750	0.4329	5.58	.Q
1.833	0.4773	6.45	. Q
1.917	0.5221	6.51	. QV
2.000	0.5659	6.35	. Q V
2.083	0.6104	6.47	. Q V
2.167	0.6593	7.10	. Q V
2.250	0.7210	8.96	. Q V.
2.333	0.7902	10.05	. QV
2.417	0.8599	10.12	. Q V
2.500	0.9576	14.19	. V Q.
2.583	1.0740	16.90	. V. Q
2.667	1.1989	18.14	. . V Q
2.750	1.2991	14.55	. Q. V
2.833	1.3583	8.59	. Q . V
2.917	1.3995	5.98	.Q . V
3.000	1.4312	4.60	Q. . V
3.083	1.4506	2.82	. Q . V.
3.167	1.4615	1.58	. Q . V.
3.250	1.4680	0.95	.Q . V.
3.333	1.4722	0.60	.Q . V.
3.417	1.4749	0.39	Q . V.
3.500	1.4764	0.23	Q . V.
3.583	1.4772	0.11	Q . V.
3.667	1.4776	0.06	Q . V.
3.750	1.4778	0.03	Q . V.
3.833	1.4778	0.01	Q . V.
3.917	1.4779	0.00	Q . V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	235.0
10%	165.0
20%	115.0
30%	75.0
40%	40.0
50%	30.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 5-YEAR, 6 HOUR                                                          *
* REVISED                                                                 *
* JULY 29, 2013                                                           *
 ***************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 11:27 07/29/2013


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.40 INCHES
         RCFC&WCD 6-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0070	0.0035	0.0035
2	0.0084	0.0042	0.0042
3	0.0084	0.0042	0.0042
4	0.0084	0.0042	0.0042
5	0.0084	0.0042	0.0042
6	0.0098	0.0049	0.0049
7	0.0098	0.0049	0.0049
8	0.0098	0.0049	0.0049
9	0.0098	0.0049	0.0049
10	0.0098	0.0049	0.0049
11	0.0098	0.0049	0.0049
12	0.0112	0.0056	0.0056
13	0.0112	0.0056	0.0056
14	0.0112	0.0056	0.0056
15	0.0112	0.0056	0.0056
16	0.0112	0.0056	0.0056
17	0.0112	0.0056	0.0056
18	0.0112	0.0056	0.0056
19	0.0112	0.0056	0.0056
20	0.0112	0.0056	0.0056
21	0.0112	0.0056	0.0056
22	0.0112	0.0056	0.0056
23	0.0112	0.0056	0.0056
24	0.0126	0.0063	0.0063
25	0.0112	0.0056	0.0056
26	0.0126	0.0063	0.0063
27	0.0126	0.0063	0.0063
28	0.0126	0.0063	0.0063
29	0.0126	0.0063	0.0063
30	0.0126	0.0063	0.0063
31	0.0126	0.0063	0.0063
32	0.0126	0.0063	0.0063
33	0.0140	0.0070	0.0070
34	0.0140	0.0070	0.0070
35	0.0140	0.0070	0.0070
36	0.0140	0.0070	0.0070
37	0.0140	0.0070	0.0070
38	0.0154	0.0077	0.0077
39	0.0154	0.0077	0.0077
40	0.0154	0.0077	0.0077
41	0.0168	0.0081	0.0087
42	0.0182	0.0081	0.0101
43	0.0196	0.0081	0.0115

44	0.0196	0.0081	0.0115
45	0.0210	0.0081	0.0129
46	0.0210	0.0081	0.0129
47	0.0224	0.0081	0.0143
48	0.0224	0.0081	0.0143
49	0.0238	0.0081	0.0157
50	0.0252	0.0081	0.0171
51	0.0266	0.0081	0.0185
52	0.0280	0.0081	0.0199
53	0.0294	0.0081	0.0213
54	0.0294	0.0081	0.0213
55	0.0308	0.0081	0.0227
56	0.0322	0.0081	0.0241
57	0.0336	0.0081	0.0255
58	0.0336	0.0081	0.0255
59	0.0350	0.0081	0.0269
60	0.0364	0.0081	0.0283
61	0.0434	0.0081	0.0353
62	0.0504	0.0081	0.0423
63	0.0546	0.0081	0.0465
64	0.0588	0.0081	0.0507
65	0.0658	0.0081	0.0577
66	0.0784	0.0081	0.0703
67	0.0266	0.0081	0.0185
68	0.0126	0.0063	0.0063
69	0.0084	0.0042	0.0042
70	0.0070	0.0035	0.0035
71	0.0042	0.0021	0.0021
72	0.0028	0.0014	0.0014

TOTAL STORM RAINFALL(INCHES) = 1.40
TOTAL SOIL-LOSS(INCHES) = 0.47
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.93

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.8440
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.6868

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6 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	5.0	10.0	15.0	20.0
0.083	0.0009	0.13	Q	.	.	.	.
0.167	0.0048	0.57	VQ	.	.	.	.
0.250	0.0106	0.83	VQ	.	.	.	.
0.333	0.0171	0.94	VQ	.	.	.	.
0.417	0.0239	1.00	VQ	.	.	.	.
0.500	0.0313	1.06	V Q	.	.	.	.
0.583	0.0393	1.17	V Q	.	.	.	.
0.667	0.0477	1.22	.VQ	.	.	.	.
0.750	0.0563	1.25	.VQ	.	.	.	.
0.833	0.0650	1.26	.VQ	.	.	.	.
0.917	0.0738	1.27	.VQ	.	.	.	.
1.000	0.0828	1.30	.VQ	.	.	.	.
1.083	0.0923	1.39	. Q	.	.	.	.

1.167	0.1022	1.43	. Q . . .
1.250	0.1121	1.44	. Q . . .
1.333	0.1221	1.45	. Q . . .
1.417	0.1322	1.46	. QV . . .
1.500	0.1423	1.46	. QV . . .
1.583	0.1524	1.47	. QV . . .
1.667	0.1625	1.47	. QV . . .
1.750	0.1726	1.47	. Q V . . .
1.833	0.1827	1.47	. Q V . . .
1.917	0.1928	1.47	. Q V . . .
2.000	0.2031	1.50	. Q V . . .
2.083	0.2138	1.55	. Q V . . .
2.167	0.2244	1.53	. Q V . . .
2.250	0.2353	1.59	. Q V . . .
2.333	0.2465	1.62	. Q V . . .
2.417	0.2578	1.63	. Q V . . .
2.500	0.2691	1.64	. Q V . . .
2.583	0.2804	1.65	. Q V . . .
2.667	0.2918	1.65	. Q V . . .
2.750	0.3033	1.68	. Q V . . .
2.833	0.3154	1.76	. Q V . . .
2.917	0.3278	1.80	. Q V . . .
3.000	0.3403	1.81	. Q V . . .
3.083	0.3528	1.82	. Q V . . .
3.167	0.3656	1.85	. Q V . . .
3.250	0.3790	1.94	. Q V . . .
3.333	0.3926	1.98	. Q V. . .
3.417	0.4066	2.03	. Q V. . .
3.500	0.4218	2.21	. Q V . . .
3.583	0.4390	2.49	. Q V . . .
3.667	0.4579	2.75	. Q V . . .
3.750	0.4781	2.92	. Q .V . . .
3.833	0.4997	3.14	. Q .V . . .
3.917	0.5225	3.30	. Q . V . . .
4.000	0.5467	3.52	. Q . V . . .
4.083	0.5720	3.68	. Q . V . . .
4.167	0.5992	3.95	. Q . V . . .
4.250	0.6286	4.27	. Q . V . . .
4.333	0.6603	4.60	. Q. V . . .
4.417	0.6944	4.95	. Q. V . . .
4.500	0.7306	5.26	. Q V . . .
4.583	0.7681	5.45	. Q V . . .
4.667	0.8077	5.74	. .Q V. . .
4.750	0.8495	6.08	. . Q V . . .
4.833	0.8935	6.37	. . Q .V . . .
4.917	0.9386	6.56	. . Q . V . . .
5.000	0.9858	6.85	. . Q . V . . .
5.083	1.0367	7.39	. . Q . V . . .
5.167	1.0960	8.61	. . Q . V . . .
5.250	1.1651	10.02	. . Q V . . .
5.333	1.2423	11.22	. . . Q V. . .
5.417	1.3281	12.45	. . . Q .V . . .
5.500	1.4259	14.21	. . . Q . V . . .
5.583	1.5252	14.41	. . . Q . V . . .
5.667	1.5850	8.69	. . Q . . V . . .
5.750	1.6194	5.00	. Q. . . . V . . .
5.833	1.6421	3.30	. Q . . . . V . . .
5.917	1.6583	2.35	. Q . . . . V. . .
6.000	1.6695	1.63	. Q . . . . V. . .
6.083	1.6769	1.07	. Q . . . . V. . .
6.167	1.6810	0.60	.Q . . . . V. . .
6.250	1.6836	0.37	Q . . . . V. . .
6.333	1.6851	0.23	Q . . . . V. . .

```
6.417      1.6860      0.12  Q          .          .          .          V.
6.500      1.6864      0.06  Q          .          .          .          V.
6.583      1.6866      0.03  Q          .          .          .          V.
6.667      1.6867      0.01  Q          .          .          .          V.
6.750      1.6867      0.01  Q          .          .          .          V.
-------------------------------------------------------------------------------
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	405.0
10%	290.0
20%	130.0
30%	90.0
40%	60.0
50%	40.0
60%	30.0
70%	20.0
80%	15.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
          (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                (Synthetic Unit Hydrograph Version 18.0)
                Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 5-YEAR, 24 HOUR                                                       *
*                                                                       *
*                                                                       *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:32 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

       (UNIT-HYDROGRAPH ADDED TO STREAM #1)

          WATERSHED AREA =       21.700 ACRES
          BASEFLOW =   0.000 CFS/SQUARE-MILE
          *USER ENTERED "LAG" TIME =     0.100 HOURS
           CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
           THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
           MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
          VALLEY S-GRAPH SELECTED
          UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
          LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
          MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.049
          USER-ENTERED RAINFALL =  2.20 INCHES
          RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
          *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


          UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
          UNIT INTERVAL PERCENTAGE OF LAG-TIME = 250.000


 ============================================================================
                        UNIT HYDROGRAPH DETERMINATION

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     INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
      NUMBER          MEAN VALUES          ORDINATES(CFS)
 ----------------------------------------------------------------------------
```

1	50.817	44.454
2	90.903	35.066
3	97.798	6.031
4	99.444	1.441
5	99.778	0.292
6	99.944	0.146
7	100.000	0.049

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UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0044	0.0022	0.0022
2	0.0066	0.0033	0.0033
3	0.0066	0.0033	0.0033
4	0.0088	0.0044	0.0044
5	0.0066	0.0033	0.0033
6	0.0066	0.0033	0.0033
7	0.0066	0.0033	0.0033
8	0.0088	0.0044	0.0044
9	0.0088	0.0044	0.0044
10	0.0088	0.0044	0.0044
11	0.0110	0.0055	0.0055
12	0.0110	0.0055	0.0055
13	0.0110	0.0055	0.0055
14	0.0110	0.0055	0.0055
15	0.0110	0.0055	0.0055
16	0.0132	0.0066	0.0066
17	0.0132	0.0066	0.0066
18	0.0154	0.0077	0.0077
19	0.0154	0.0077	0.0077
20	0.0176	0.0088	0.0088
21	0.0132	0.0066	0.0066
22	0.0154	0.0077	0.0077
23	0.0176	0.0088	0.0088
24	0.0176	0.0088	0.0088
25	0.0198	0.0099	0.0099
26	0.0198	0.0099	0.0099
27	0.0220	0.0110	0.0110
28	0.0220	0.0110	0.0110
29	0.0220	0.0110	0.0110
30	0.0242	0.0121	0.0121
31	0.0264	0.0132	0.0132
32	0.0286	0.0143	0.0143
33	0.0330	0.0165	0.0165
34	0.0330	0.0165	0.0165
35	0.0352	0.0176	0.0176
36	0.0374	0.0187	0.0187
37	0.0418	0.0209	0.0209
38	0.0440	0.0220	0.0220
39	0.0462	0.0231	0.0231
40	0.0484	0.0242	0.0242
41	0.0330	0.0165	0.0165
42	0.0330	0.0165	0.0165
43	0.0440	0.0220	0.0220
44	0.0440	0.0220	0.0220
45	0.0418	0.0209	0.0209
46	0.0418	0.0209	0.0209
47	0.0374	0.0187	0.0187
48	0.0396	0.0198	0.0198

49	0.0550	0.0225	0.0325
50	0.0572	0.0222	0.0350
51	0.0616	0.0219	0.0397
52	0.0638	0.0216	0.0422
53	0.0748	0.0212	0.0536
54	0.0748	0.0209	0.0539
55	0.0506	0.0206	0.0300
56	0.0506	0.0203	0.0303
57	0.0594	0.0200	0.0394
58	0.0572	0.0197	0.0375
59	0.0572	0.0194	0.0378
60	0.0550	0.0191	0.0359
61	0.0528	0.0188	0.0340
62	0.0506	0.0185	0.0321
63	0.0418	0.0182	0.0236
64	0.0418	0.0180	0.0238
65	0.0088	0.0044	0.0044
66	0.0088	0.0044	0.0044
67	0.0066	0.0033	0.0033
68	0.0066	0.0033	0.0033
69	0.0110	0.0055	0.0055
70	0.0110	0.0055	0.0055
71	0.0110	0.0055	0.0055
72	0.0088	0.0044	0.0044
73	0.0088	0.0044	0.0044
74	0.0088	0.0044	0.0044
75	0.0066	0.0033	0.0033
76	0.0044	0.0022	0.0022
77	0.0066	0.0033	0.0033
78	0.0088	0.0044	0.0044
79	0.0066	0.0033	0.0033
80	0.0044	0.0022	0.0022
81	0.0066	0.0033	0.0033
82	0.0066	0.0033	0.0033
83	0.0066	0.0033	0.0033
84	0.0044	0.0022	0.0022
85	0.0066	0.0033	0.0033
86	0.0044	0.0022	0.0022
87	0.0066	0.0033	0.0033
88	0.0044	0.0022	0.0022
89	0.0066	0.0033	0.0033
90	0.0044	0.0022	0.0022
91	0.0044	0.0022	0.0022
92	0.0044	0.0022	0.0022
93	0.0044	0.0022	0.0022
94	0.0044	0.0022	0.0022
95	0.0044	0.0022	0.0022
96	0.0044	0.0022	0.0022

TOTAL STORM RAINFALL(INCHES) = 2.20
TOTAL SOIL-LOSS(INCHES) = 0.97
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.23

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.7555
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.2217

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0007	0.10	Q	.	.	.	.
0.167	0.0013	0.10	Q	.	.	.	.
0.250	0.0020	0.10	Q	.	.	.	.
0.333	0.0036	0.22	Q	.	.	.	.
0.417	0.0051	0.22	Q	.	.	.	.
0.500	0.0066	0.22	Q	.	.	.	.
0.583	0.0085	0.28	VQ	.	.	.	.
0.667	0.0104	0.28	VQ	.	.	.	.
0.750	0.0123	0.28	VQ	.	.	.	.
0.833	0.0146	0.33	VQ	.	.	.	.
0.917	0.0169	0.33	VQ	.	.	.	.
1.000	0.0193	0.33	VQ	.	.	.	.
1.083	0.0215	0.33	VQ	.	.	.	.
1.167	0.0237	0.33	VQ	.	.	.	.
1.250	0.0260	0.33	VQ	.	.	.	.
1.333	0.0280	0.29	VQ	.	.	.	.
1.417	0.0301	0.29	VQ	.	.	.	.
1.500	0.0321	0.29	VQ	.	.	.	.
1.583	0.0341	0.29	VQ	.	.	.	.
1.667	0.0361	0.29	VQ	.	.	.	.
1.750	0.0381	0.29	VQ	.	.	.	.
1.833	0.0404	0.34	VQ	.	.	.	.
1.917	0.0427	0.34	VQ	.	.	.	.
2.000	0.0451	0.34	VQ	.	.	.	.
2.083	0.0477	0.38	VQ	.	.	.	.
2.167	0.0502	0.38	VQ	.	.	.	.
2.250	0.0528	0.38	VQ	.	.	.	.
2.333	0.0555	0.38	VQ	.	.	.	.
2.417	0.0581	0.38	Q	.	.	.	.
2.500	0.0607	0.38	Q	.	.	.	.
2.583	0.0637	0.43	.Q	.	.	.	.
2.667	0.0667	0.43	.Q	.	.	.	.
2.750	0.0697	0.43	.Q	.	.	.	.
2.833	0.0730	0.47	.Q	.	.	.	.
2.917	0.0762	0.47	.Q	.	.	.	.
3.000	0.0795	0.47	.Q	.	.	.	.
3.083	0.0828	0.48	.Q	.	.	.	.
3.167	0.0861	0.48	.Q	.	.	.	.
3.250	0.0894	0.48	.Q	.	.	.	.
3.333	0.0927	0.48	.Q	.	.	.	.
3.417	0.0960	0.48	.Q	.	.	.	.
3.500	0.0993	0.48	.Q	.	.	.	.
3.583	0.1026	0.48	.Q	.	.	.	.
3.667	0.1059	0.48	.Q	.	.	.	.
3.750	0.1092	0.48	.Q	.	.	.	.
3.833	0.1129	0.53	. Q	.	.	.	.
3.917	0.1165	0.53	. Q	.	.	.	.
4.000	0.1202	0.53	. Q	.	.	.	.
4.083	0.1241	0.57	. Q	.	.	.	.
4.167	0.1280	0.57	. Q	.	.	.	.
4.250	0.1319	0.57	. Q	.	.	.	.
4.333	0.1362	0.62	. Q	.	.	.	.
4.417	0.1405	0.62	. Q	.	.	.	.
4.500	0.1448	0.62	. Q	.	.	.	.
4.583	0.1494	0.66	. Q	.	.	.	.
4.667	0.1540	0.66	. Q	.	.	.	.
4.750	0.1585	0.66	. Q	.	.	.	.

4.833	0.1635	0.72	. Q . . . .
4.917	0.1685	0.72	. QV . . . .
5.000	0.1734	0.72	. QV . . . .
5.083	0.1780	0.66	. QV . . . .
5.167	0.1825	0.66	. QV . . . .
5.250	0.1871	0.66	. QV . . . .
5.333	0.1915	0.64	. QV . . . .
5.417	0.1959	0.64	. QV . . . .
5.500	0.2004	0.64	. QV . . . .
5.583	0.2053	0.72	. QV . . . .
5.667	0.2102	0.72	. QV . . . .
5.750	0.2152	0.72	. QV . . . .
5.833	0.2204	0.76	. Q . . . .
5.917	0.2256	0.76	. QV . . . .
6.000	0.2309	0.76	. QV . . . .
6.083	0.2365	0.82	. QV . . . .
6.167	0.2421	0.82	. QV . . . .
6.250	0.2477	0.82	. QV . . . .
6.333	0.2536	0.86	. QV . . . .
6.417	0.2595	0.86	. QV . . . .
6.500	0.2654	0.86	. QV . . . .
6.583	0.2717	0.91	. QV . . . .
6.667	0.2780	0.91	. Q V . . . .
6.750	0.2843	0.91	. Q V . . . .
6.833	0.2909	0.95	. Q V . . . .
6.917	0.2974	0.95	. Q V . . . .
7.000	0.3040	0.95	. Q V . . . .
7.083	0.3106	0.96	. Q V . . . .
7.167	0.3172	0.96	. Q V . . . .
7.250	0.3238	0.96	. Q V . . . .
7.333	0.3308	1.01	. QV . . . .
7.417	0.3377	1.01	. Q V . . . .
7.500	0.3447	1.01	. Q V . . . .
7.583	0.3523	1.10	. Q V . . . .
7.667	0.3598	1.10	. Q V . . . .
7.750	0.3674	1.10	. Q V . . . .
7.833	0.3756	1.19	. Q V . . . .
7.917	0.3838	1.19	. Q V . . . .
8.000	0.3920	1.19	. Q V . . . .
8.083	0.4012	1.34	. Q V . . . .
8.167	0.4105	1.34	. Q V . . . .
8.250	0.4197	1.34	. Q V . . . .
8.333	0.4295	1.42	. Q V . . . .
8.417	0.4393	1.42	. Q V . . . .
8.500	0.4491	1.42	. Q V . . . .
8.583	0.4593	1.49	. Q V . . . .
8.667	0.4696	1.49	. Q V . . . .
8.750	0.4798	1.49	. Q V . . . .
8.833	0.4907	1.58	. Q V . . . .
8.917	0.5015	1.58	. Q V. . . . .
9.000	0.5124	1.58	. Q V. . . . .
9.083	0.5243	1.72	. Q V. . . . .
9.167	0.5361	1.72	. Q V. . . . .
9.250	0.5480	1.72	. Q V. . . . .
9.333	0.5608	1.86	. Q V . . . .
9.417	0.5736	1.86	. Q V . . . .
9.500	0.5864	1.86	. Q V . . . .
9.583	0.5999	1.96	. Q V . . . .
9.667	0.6134	1.96	. Q V . . . .
9.750	0.6269	1.96	. Q V . . . .
9.833	0.6410	2.06	. Q .V . . . .
9.917	0.6552	2.06	. Q .V . . . .
10.000	0.6694	2.06	. Q . V . . . .

10.083	0.6815	1.76	Q . V . . .
10.167	0.6936	1.76	Q . V . . .
10.250	0.7058	1.76	Q . V . . .
10.333	0.7161	1.50	Q . V . . .
10.417	0.7265	1.50	Q . V . . .
10.500	0.7368	1.50	Q . V . . .
10.583	0.7485	1.70	Q . V . . .
10.667	0.7602	1.70	Q . V . . .
10.750	0.7720	1.70	Q . V . . .
10.833	0.7849	1.88	Q . V . . .
10.917	0.7979	1.88	Q . V . . .
11.000	0.8109	1.88	Q . V . . .
11.083	0.8238	1.87	Q . V . . .
11.167	0.8366	1.87	Q . V . . .
11.250	0.8495	1.87	Q . V . . .
11.333	0.8621	1.83	Q . V . . .
11.417	0.8747	1.83	Q . V . . .
11.500	0.8874	1.83	Q . V . . .
11.583	0.8993	1.73	Q . V . . .
11.667	0.9112	1.73	Q . V . . .
11.750	0.9231	1.73	Q . V . . .
11.833	0.9349	1.70	Q . V . . .
11.917	0.9466	1.70	Q . V . . .
12.000	0.9583	1.70	Q . V . . .
12.083	0.9741	2.29	Q. V . . .
12.167	0.9899	2.29	Q. V . . .
12.250	1.0056	2.29	Q. V . . .
12.333	1.0253	2.85	.Q V . . .
12.417	1.0449	2.85	.Q V . . .
12.500	1.0645	2.85	.Q V. . .
12.583	1.0868	3.23	. Q V. . .
12.667	1.1090	3.23	. Q V. . .
12.750	1.1312	3.23	. Q V . . .
12.833	1.1556	3.54	. Q V . . .
12.917	1.1799	3.54	. Q V . . .
13.000	1.2043	3.54	. Q V . . .
13.083	1.2330	4.17	. Q . V . . .
13.167	1.2617	4.17	. Q . V . . .
13.250	1.2904	4.17	. Q . V . . .
13.333	1.3221	4.60	. Q . V . . .
13.417	1.3538	4.60	. Q . V . . .
13.500	1.3855	4.60	. Q . V . . .
13.583	1.4104	3.63	. Q . V . . .
13.667	1.4354	3.63	. Q . V . . .
13.750	1.4604	3.63	. Q . V . . .
13.833	1.4798	2.82	.Q . V . . .
13.917	1.4992	2.82	.Q . V . . .
14.000	1.5187	2.82	.Q . V . . .
14.083	1.5400	3.10	. Q . V . . .
14.167	1.5613	3.10	. Q . V . . .
14.250	1.5827	3.10	. Q . V . . .
14.333	1.6054	3.30	. Q . V . . .
14.417	1.6282	3.30	. Q . V. . .
14.500	1.6509	3.30	. Q . V. . .
14.583	1.6736	3.30	. Q . V . . .
14.667	1.6963	3.30	. Q . V . . .
14.750	1.7190	3.30	. Q . V . . .
14.833	1.7412	3.22	. Q . .V . . .
14.917	1.7634	3.22	. Q . .V . . .
15.000	1.7856	3.22	. Q . . V . . .
15.083	1.8067	3.07	. Q . . V . . .
15.167	1.8279	3.07	. Q . . V . . .
15.250	1.8490	3.07	. Q . . V . . .

```
15.333    1.8690    2.91  .          .Q        .          .  V       .
15.417    1.8891    2.91  .          .Q        .          .   V      .
15.500    1.9091    2.91  .          .Q        .          .   V      .
15.583    1.9259    2.45  .        Q.          .          .   V      .
15.667    1.9428    2.45  .        Q.          .          .   V      .
15.750    1.9596    2.45  .        Q.          .          .    V     .
15.833    1.9744    2.15  .       Q .          .          .    V     .
15.917    1.9892    2.15  .       Q .          .          .    V     .
16.000    2.0040    2.15  .       Q .          .          .     V    .
16.083    2.0125    1.24  .   Q     .          .          .     V    .
16.167    2.0210    1.24  .   Q     .          .          .     V    .
16.250    2.0295    1.24  .   Q     .          .          .     V    .
16.333    2.0333    0.54  . Q       .          .          .     V    .
16.417    2.0370    0.54  . Q       .          .          .     V    .
16.500    2.0408    0.54  . Q       .          .          .     V    .
16.583    2.0434    0.38  .Q        .          .          .     V    .
16.667    2.0459    0.38  .Q        .          .          .     V    .
16.750    2.0485    0.38  .Q        .          .          .     V    .
16.833    2.0506    0.31  .Q        .          .          .     V    .
16.917    2.0527    0.31  .Q        .          .          .     V    .
17.000    2.0549    0.31  .Q        .          .          .     V    .
17.083    2.0576    0.39  .Q        .          .          .      V   .
17.167    2.0603    0.39  .Q        .          .          .      V   .
17.250    2.0630    0.39  .Q        .          .          .      V   .
17.333    2.0662    0.47  .Q        .          .          .      V   .
17.417    2.0694    0.47  .Q        .          .          .      V   .
17.500    2.0726    0.47  .Q        .          .          .      V   .
17.583    2.0759    0.48  .Q        .          .          .      V   .
17.667    2.0792    0.48  .Q        .          .          .      V   .
17.750    2.0824    0.48  .Q        .          .          .      V   .
17.833    2.0854    0.43  .Q        .          .          .      V   .
17.917    2.0884    0.43  .Q        .          .          .      V   .
18.000    2.0913    0.43  .Q        .          .          .      V   .
18.083    2.0941    0.39  .Q        .          .          .      V   .
18.167    2.0968    0.39  .Q        .          .          .      V   .
18.250    2.0995    0.39  .Q        .          .          .      V   .
18.333    2.1021    0.39  .Q        .          .          .      V   .
18.417    2.1048    0.39  .Q        .          .          .      V   .
18.500    2.1075    0.39  .Q        .          .          .      V   .
18.583    2.1098    0.34  .Q        .          .          .      V   .
18.667    2.1121    0.34  .Q        .          .          .       V  .
18.750    2.1144    0.34  .Q        .          .          .       V  .
18.833    2.1161    0.25  Q         .          .          .       V  .
18.917    2.1178    0.25  Q         .          .          .       V  .
19.000    2.1196    0.25  Q         .          .          .       V  .
19.083    2.1213    0.25  .Q        .          .          .       V  .
19.167    2.1230    0.25  .Q        .          .          .       V  .
19.250    2.1248    0.25  .Q        .          .          .       V  .
19.333    2.1271    0.33  .Q        .          .          .       V  .
19.417    2.1293    0.33  .Q        .          .          .       V  .
19.500    2.1316    0.33  .Q        .          .          .       V  .
19.583    2.1339    0.33  .Q        .          .          .       V  .
19.667    2.1361    0.33  .Q        .          .          .       V  .
19.750    2.1384    0.33  .Q        .          .          .       V  .
19.833    2.1400    0.25  Q         .          .          .       V  .
19.917    2.1417    0.25  Q         .          .          .       V  .
20.000    2.1434    0.25  Q         .          .          .       V  .
20.083    2.1452    0.25  .Q        .          .          .       V  .
20.167    2.1469    0.25  .Q        .          .          .       V  .
20.250    2.1486    0.25  .Q        .          .          .       V  .
20.333    2.1506    0.28  .Q        .          .          .       V  .
20.417    2.1525    0.28  .Q        .          .          .       V  .
20.500    2.1545    0.28  .Q        .          .          .       V  .
```

20.583	2.1564	0.29	.Q	.	.	.	V .
20.667	2.1584	0.29	.Q	.	.	.	V .
20.750	2.1604	0.29	.Q	.	.	.	V .
20.833	2.1621	0.24	Q	.	.	.	V .
20.917	2.1637	0.24	Q	.	.	.	V .
21.000	2.1654	0.24	Q	.	.	.	V .
21.083	2.1671	0.25	Q	.	.	.	V.
21.167	2.1688	0.25	Q	.	.	.	V.
21.250	2.1705	0.25	Q	.	.	.	V.
21.333	2.1721	0.23	Q	.	.	.	V.
21.417	2.1737	0.23	Q	.	.	.	V.
21.500	2.1753	0.23	Q	.	.	.	V.
21.583	2.1770	0.25	Q	.	.	.	V.
21.667	2.1788	0.25	Q	.	.	.	V.
21.750	2.1805	0.25	Q	.	.	.	V.
21.833	2.1821	0.23	Q	.	.	.	V.
21.917	2.1837	0.23	Q	.	.	.	V.
22.000	2.1853	0.23	Q	.	.	.	V.
22.083	2.1870	0.25	Q	.	.	.	V.
22.167	2.1887	0.25	Q	.	.	.	V.
22.250	2.1904	0.25	Q	.	.	.	V.
22.333	2.1920	0.23	Q	.	.	.	V.
22.417	2.1936	0.23	Q	.	.	.	V.
22.500	2.1952	0.23	Q	.	.	.	V.
22.583	2.1966	0.20	Q	.	.	.	V.
22.667	2.1980	0.20	Q	.	.	.	V.
22.750	2.1993	0.20	Q	.	.	.	V.
22.833	2.2007	0.19	Q	.	.	.	V.
22.917	2.2020	0.19	Q	.	.	.	V.
23.000	2.2034	0.19	Q	.	.	.	V.
23.083	2.2047	0.19	Q	.	.	.	V.
23.166	2.2060	0.19	Q	.	.	.	V.
23.250	2.2073	0.19	Q	.	.	.	V.
23.333	2.2087	0.19	Q	.	.	.	V.
23.416	2.2100	0.19	Q	.	.	.	V.
23.500	2.2113	0.19	Q	.	.	.	V.
23.583	2.2126	0.19	Q	.	.	.	V.
23.666	2.2140	0.19	Q	.	.	.	V.
23.750	2.2153	0.19	Q	.	.	.	V.
23.833	2.2166	0.19	Q	.	.	.	V.
23.916	2.2179	0.19	Q	.	.	.	V.
24.000	2.2193	0.19	Q	.	.	.	V.
24.083	2.2199	0.09	Q	.	.	.	V.
24.166	2.2206	0.09	Q	.	.	.	V.
24.250	2.2212	0.09	Q	.	.	.	V.
24.333	2.2213	0.02	Q	.	.	.	V.
24.416	2.2215	0.02	Q	.	.	.	V.
24.500	2.2216	0.02	Q	.	.	.	V.
24.583	2.2216	0.00	Q	.	.	.	V.
24.666	2.2216	0.00	Q	.	.	.	V.
24.750	2.2217	0.00	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1485.0
10%	855.0
20%	570.0
30%	465.0

	F5Y24H.RES
40%	315.0
50%	210.0
60%	195.0
70%	105.0
80%	30.0
90%	30.0

END OF FLOODSCx ROUTING ANALYSIS

10-YEAR FREQUENCY

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 10-YEAT, 1 HOUR                                                        *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:02 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  0.78 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

1	13.994	36.725
2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0335	0.0081	0.0254
2	0.0355	0.0081	0.0274
3	0.0378	0.0081	0.0297
4	0.0419	0.0081	0.0338
5	0.0443	0.0081	0.0362
6	0.0506	0.0081	0.0425
7	0.0598	0.0081	0.0517
8	0.0659	0.0081	0.0579
9	0.1010	0.0081	0.0929
10	0.2174	0.0081	0.2094
11	0.0552	0.0081	0.0471
12	0.0372	0.0081	0.0291

TOTAL STORM RAINFALL(INCHES) = 0.78
TOTAL SOIL-LOSS(INCHES) = 0.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.68

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.1754
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.2345

==========

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 10.0 20.0 30.0 40.0
0.083	0.0064	0.93	Q . . . .
0.167	0.0344	4.05	.V Q . . . .
0.250	0.0733	5.65	. V Q . . . .
0.333	0.1195	6.71	. V Q . . . .
0.417	0.1729	7.75	. V Q . . . .
0.500	0.2331	8.75	. VQ . . . .
0.583	0.3037	10.25	. VQ . . . .
0.667	0.3872	12.12	. Q . . . .
0.750	0.4895	14.86	. QV . . . .

```
0.833    0.6549   24.01  .          .          .V  Q      .          .
0.917    0.8899   34.12  .          .          .       V  .   Q      .
1.000    1.0332   20.81  .          .          Q          .  V      .
1.083    1.1189   12.45  .          . Q        .          .     V   .
1.167    1.1634    6.46  .     Q    .          .          .      V  .
1.250    1.1898    3.83  .  Q       .          .          .       V .
1.333    1.2070    2.50  . Q        .          .          .        V.
1.417    1.2181    1.60  .Q         .          .          .        V.
1.500    1.2245    0.94  Q          .          .          .        V.
1.583    1.2291    0.66  Q          .          .          .        V.
1.667    1.2320    0.42  Q          .          .          .        V.
1.750    1.2336    0.23  Q          .          .          .        V.
1.833    1.2342    0.10  Q          .          .          .        V.
1.917    1.2344    0.03  Q          .          .          .        V.
2.000    1.2345    0.01  Q          .          .          .        V.
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	120.0
10%	70.0
20%	45.0
30%	35.0
40%	20.0
50%	15.0
60%	15.0
70%	10.0
80%	5.0
90%	5.0

END OF FLOODSCX ROUTING ANALYSIS

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
          (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                (Synthetic Unit Hydrograph Version 18.0)
                Release Date: 05/01/2011  License ID 1499

                         Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 10-YEAR, 3 HOUR                                                          *
*                                                                          *
*                                                                          *
 ****************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:00 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE     100.00 TO NODE     101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1               13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0162	0.0081	0.0082
2	0.0162	0.0081	0.0082
3	0.0138	0.0069	0.0069
4	0.0188	0.0081	0.0107
5	0.0188	0.0081	0.0107
6	0.0225	0.0081	0.0144
7	0.0188	0.0081	0.0107
8	0.0225	0.0081	0.0144
9	0.0225	0.0081	0.0144
10	0.0188	0.0081	0.0107
11	0.0200	0.0081	0.0119
12	0.0225	0.0081	0.0144
13	0.0275	0.0081	0.0194
14	0.0275	0.0081	0.0194
15	0.0275	0.0081	0.0194
16	0.0250	0.0081	0.0169
17	0.0325	0.0081	0.0244
18	0.0338	0.0081	0.0257
19	0.0300	0.0081	0.0219
20	0.0338	0.0081	0.0257
21	0.0413	0.0081	0.0332
22	0.0388	0.0081	0.0307
23	0.0363	0.0081	0.0282
24	0.0375	0.0081	0.0294
25	0.0388	0.0081	0.0307
26	0.0525	0.0081	0.0444
27	0.0625	0.0081	0.0544
28	0.0437	0.0081	0.0357
29	0.0850	0.0081	0.0769
30	0.0913	0.0081	0.0832
31	0.1025	0.0081	0.0944
32	0.0738	0.0081	0.0657
33	0.0250	0.0081	0.0169
34	0.0225	0.0081	0.0144
35	0.0225	0.0081	0.0144
36	0.0075	0.0038	0.0038

TOTAL STORM RAINFALL(INCHES) = 1.25
TOTAL SOIL-LOSS(INCHES) = 0.29
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.96

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.5162

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.7433

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3 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 7.5 15.0 22.5 30.0
0.083	0.0021	0.30	Q
0.167	0.0109	1.28	VQ
0.250	0.0222	1.64	V Q
0.333	0.0345	1.80	V Q
0.417	0.0503	2.29	.V Q
0.500	0.0686	2.65	.V Q
0.583	0.0897	3.07	. V Q
0.667	0.1105	3.02	. V Q
0.750	0.1339	3.39	. VQ
0.833	0.1576	3.44	. VQ
0.917	0.1791	3.12	. Q
1.000	0.2013	3.22	. Q
1.083	0.2269	3.72	. QV
1.167	0.2574	4.44	. Q
1.250	0.2901	4.74	. Q
1.333	0.3230	4.78	. QV
1.417	0.3563	4.83	. Q V
1.500	0.3956	5.71	. Q V.
1.583	0.4375	6.08	. Q V
1.667	0.4787	5.98	. Q V
1.750	0.5243	6.62	. Q . V
1.833	0.5767	7.61	. Q V
1.917	0.6297	7.68	. Q V
2.000	0.6814	7.51	. Q V
2.083	0.7340	7.64	. Q V
2.167	0.7915	8.36	. .Q V .
2.250	0.8636	10.47	. . Q V.
2.333	0.9443	11.71	. . Q .V
2.417	1.0254	11.78	. . Q . V
2.500	1.1385	16.41	. .Q V
2.583	1.2728	19.50	. . Q V.
2.667	1.4167	20.90	. . Q . V
2.750	1.5326	16.82	. . Q V
2.833	1.6018	10.05	. . Q V
2.917	1.6506	7.09	. Q. V
3.000	1.6883	5.48	. Q . V
3.083	1.7112	3.33	. Q . V.
3.167	1.7240	1.86	. Q . V.
3.250	1.7317	1.11	.Q . V.
3.333	1.7365	0.71	Q . V.
3.417	1.7397	0.46	Q . V.
3.500	1.7416	0.27	Q . V.
3.583	1.7425	0.13	Q . V.
3.667	1.7429	0.07	Q . V.
3.750	1.7432	0.03	Q . V.
3.833	1.7433	0.01	Q . V.
3.917	1.7433	0.00	Q . V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

F10Y3H.RES

(Note: 100% of Peak Flow Rate estimate assumed to have an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	235.0
10%	165.0
20%	115.0
30%	75.0
40%	40.0
50%	35.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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                F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
          (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                (Synthetic Unit Hydrograph Version 18.0)
                Release Date: 05/01/2011  License ID 1499

                         Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 10-YEAR, 6 HOUR                                                        *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:05 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.68 INCHES
         RCFC&WCD 6-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1               13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

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UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0084	0.0042	0.0042
2	0.0101	0.0050	0.0050
3	0.0101	0.0050	0.0050
4	0.0101	0.0050	0.0050
5	0.0101	0.0050	0.0050
6	0.0118	0.0059	0.0059
7	0.0118	0.0059	0.0059
8	0.0118	0.0059	0.0059
9	0.0118	0.0059	0.0059
10	0.0118	0.0059	0.0059
11	0.0118	0.0059	0.0059
12	0.0134	0.0067	0.0067
13	0.0134	0.0067	0.0067
14	0.0134	0.0067	0.0067
15	0.0134	0.0067	0.0067
16	0.0134	0.0067	0.0067
17	0.0134	0.0067	0.0067
18	0.0134	0.0067	0.0067
19	0.0134	0.0067	0.0067
20	0.0134	0.0067	0.0067
21	0.0134	0.0067	0.0067
22	0.0134	0.0067	0.0067
23	0.0134	0.0067	0.0067
24	0.0151	0.0076	0.0076
25	0.0134	0.0067	0.0067
26	0.0151	0.0076	0.0076
27	0.0151	0.0076	0.0076
28	0.0151	0.0076	0.0076
29	0.0151	0.0076	0.0076
30	0.0151	0.0076	0.0076
31	0.0151	0.0076	0.0076
32	0.0151	0.0076	0.0076
33	0.0168	0.0081	0.0087
34	0.0168	0.0081	0.0087
35	0.0168	0.0081	0.0087
36	0.0168	0.0081	0.0087
37	0.0168	0.0081	0.0087
38	0.0185	0.0081	0.0104
39	0.0185	0.0081	0.0104
40	0.0185	0.0081	0.0104
41	0.0202	0.0081	0.0121
42	0.0218	0.0081	0.0138
43	0.0235	0.0081	0.0154

44	0.0235	0.0081	0.0154
45	0.0252	0.0081	0.0171
46	0.0252	0.0081	0.0171
47	0.0269	0.0081	0.0188
48	0.0269	0.0081	0.0188
49	0.0286	0.0081	0.0205
50	0.0302	0.0081	0.0222
51	0.0319	0.0081	0.0238
52	0.0336	0.0081	0.0255
53	0.0353	0.0081	0.0272
54	0.0353	0.0081	0.0272
55	0.0370	0.0081	0.0289
56	0.0386	0.0081	0.0306
57	0.0403	0.0081	0.0322
58	0.0403	0.0081	0.0322
59	0.0420	0.0081	0.0339
60	0.0437	0.0081	0.0356
61	0.0521	0.0081	0.0440
62	0.0605	0.0081	0.0524
63	0.0655	0.0081	0.0574
64	0.0706	0.0081	0.0625
65	0.0790	0.0081	0.0709
66	0.0941	0.0081	0.0860
67	0.0319	0.0081	0.0238
68	0.0151	0.0076	0.0076
69	0.0101	0.0050	0.0050
70	0.0084	0.0042	0.0042
71	0.0050	0.0025	0.0025
72	0.0034	0.0017	0.0017

TOTAL STORM RAINFALL(INCHES) = 1.68
TOTAL SOIL-LOSS(INCHES) = 0.51
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.17

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.9248
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.1121

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6 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	5.0	10.0	15.0	20.0
0.083	0.0011	0.15	Q	.	.	.	.
0.167	0.0058	0.69	VQ	.	.	.	.
0.250	0.0127	1.00	VQ	.	.	.	.
0.333	0.0205	1.13	V Q	.	.	.	.
0.417	0.0287	1.20	V Q	.	.	.	.
0.500	0.0375	1.27	V Q	.	.	.	.
0.583	0.0472	1.41	V Q	.	.	.	.
0.667	0.0573	1.47	.VQ	.	.	.	.
0.750	0.0676	1.50	.VQ	.	.	.	.
0.833	0.0780	1.51	.V Q	.	.	.	.
0.917	0.0885	1.53	.V Q	.	.	.	.
1.000	0.0993	1.57	.V Q	.	.	.	.
1.083	0.1108	1.67	. VQ	.	.	.	.

1.167	0.1226	1.71	. VQ . . . .
1.250	0.1345	1.73	. VQ . . . .
1.333	0.1466	1.74	. VQ . . . .
1.417	0.1586	1.75	. Q . . . .
1.500	0.1707	1.76	. Q . . . .
1.583	0.1828	1.76	. Q . . . .
1.667	0.1950	1.76	. Q . . . .
1.750	0.2071	1.76	. Q . . . .
1.833	0.2192	1.76	. QV . . . .
1.917	0.2314	1.76	. QV . . . .
2.000	0.2437	1.79	. QV . . . .
2.083	0.2566	1.86	. QV . . . .
2.167	0.2692	1.84	. Q V . . . .
2.250	0.2824	1.91	. Q V . . . .
2.333	0.2958	1.95	. Q V . . . .
2.417	0.3093	1.96	. Q V . . . .
2.500	0.3229	1.97	. Q V . . . .
2.583	0.3365	1.97	. Q V . . . .
2.667	0.3501	1.98	. Q V . . . .
2.750	0.3640	2.02	. Q V . . . .
2.833	0.3789	2.16	. Q V . . . .
2.917	0.3942	2.22	. Q V . . . .
3.000	0.4097	2.25	. Q V . . . .
3.083	0.4253	2.26	. Q V . . . .
3.167	0.4414	2.33	. Q V . . . .
3.250	0.4589	2.54	. Q V . . . .
3.333	0.4770	2.63	. Q V. . . . .
3.417	0.4957	2.73	. Q V. . . . .
3.500	0.5165	3.01	. Q V. . . . .
3.583	0.5397	3.38	. Q V . . . .
3.667	0.5653	3.71	. Q V . . . .
3.750	0.5922	3.91	. Q .V . . . .
3.833	0.6211	4.19	. Q .V . . . .
3.917	0.6512	4.38	. Q . V . . . .
4.000	0.6833	4.65	. Q. V . . . .
4.083	0.7165	4.83	. Q. V . . . .
4.167	0.7521	5.16	. Q V . . . .
4.250	0.7902	5.54	. .Q V . . . .
4.333	0.8312	5.95	. .Q V . . . .
4.417	0.8751	6.37	. . Q V . . . .
4.500	0.9214	6.73	. . Q V . . . .
4.583	0.9694	6.96	. . Q V . . . .
4.667	1.0198	7.31	. . Q V. . . . .
4.750	1.0729	7.72	. . Q V . . . .
4.833	1.1285	8.07	. . Q .V . . . .
4.917	1.1857	8.30	. . Q . V . . . .
5.000	1.2452	8.65	. . Q . V . . . .
5.083	1.3092	9.29	. . Q . V . . . .
5.167	1.3833	10.76	. . .Q V . . . .
5.250	1.4691	12.45	. . . Q V . . . .
5.333	1.5647	13.89	. . . Q V. . . . .
5.417	1.6705	15.36	. . . QV . . . .
5.500	1.7909	17.47	. . . . VQ . . .
5.583	1.9129	17.72	. . . . QV . . .
5.667	1.9872	10.79	. . .Q . V . . .
5.750	2.0297	6.17	. . Q . . V . .
5.833	2.0576	4.05	. Q . . . V . .
5.917	2.0774	2.88	. Q . . . . V.
6.000	2.0911	1.99	. Q . . . . V.
6.083	2.1001	1.31	. Q . . . . V.
6.167	2.1051	0.73	.Q . . . . V.
6.250	2.1082	0.46	Q . . . . V.
6.333	2.1102	0.28	Q . . . . V.

6.417	2.1112	0.15	Q	.	.	.	V.
6.500	2.1117	0.07	Q	.	.	.	V.
6.583	2.1119	0.03	Q	.	.	.	V.
6.667	2.1120	0.02	Q	.	.	.	V.
6.750	2.1121	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	405.0
10%	245.0
20%	135.0
30%	95.0
40%	65.0
50%	40.0
60%	35.0
70%	25.0
80%	15.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
            (Synthetic Unit Hydrograph Version 18.0)
            Release Date: 05/01/2011  License ID 1499

                    Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 10-YEAR, 24 HOUR                                                        *
*                                                                         *
*                                                                         *
 **************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 09:08 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.049
         USER-ENTERED RAINFALL =  2.70 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 250.000


 ============================================================================
                        UNIT HYDROGRAPH DETERMINATION

 ----------------------------------------------------------------------------
     INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
      NUMBER          MEAN VALUES          ORDINATES(CFS)
 ----------------------------------------------------------------------------
```

1	50.817	44.454
2	90.903	35.066
3	97.798	6.031
4	99.444	1.441
5	99.778	0.292
6	99.944	0.146
7	100.000	0.049

P
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0054	0.0027	0.0027
2	0.0081	0.0041	0.0041
3	0.0081	0.0041	0.0041
4	0.0108	0.0054	0.0054
5	0.0081	0.0041	0.0041
6	0.0081	0.0041	0.0041
7	0.0081	0.0041	0.0041
8	0.0108	0.0054	0.0054
9	0.0108	0.0054	0.0054
10	0.0108	0.0054	0.0054
11	0.0135	0.0068	0.0068
12	0.0135	0.0068	0.0068
13	0.0135	0.0068	0.0068
14	0.0135	0.0068	0.0068
15	0.0135	0.0068	0.0068
16	0.0162	0.0081	0.0081
17	0.0162	0.0081	0.0081
18	0.0189	0.0094	0.0094
19	0.0189	0.0094	0.0094
20	0.0216	0.0108	0.0108
21	0.0162	0.0081	0.0081
22	0.0189	0.0094	0.0094
23	0.0216	0.0108	0.0108
24	0.0216	0.0108	0.0108
25	0.0243	0.0121	0.0121
26	0.0243	0.0121	0.0121
27	0.0270	0.0135	0.0135
28	0.0270	0.0135	0.0135
29	0.0270	0.0135	0.0135
30	0.0297	0.0149	0.0149
31	0.0324	0.0162	0.0162
32	0.0351	0.0175	0.0175
33	0.0405	0.0203	0.0203
34	0.0405	0.0203	0.0203
35	0.0432	0.0216	0.0216
36	0.0459	0.0230	0.0230
37	0.0513	0.0257	0.0257
38	0.0540	0.0265	0.0275
39	0.0567	0.0261	0.0306
40	0.0594	0.0257	0.0337
41	0.0405	0.0203	0.0203
42	0.0405	0.0203	0.0203
43	0.0540	0.0246	0.0294
44	0.0540	0.0243	0.0297
45	0.0513	0.0239	0.0274
46	0.0513	0.0236	0.0277
47	0.0459	0.0230	0.0230
48	0.0486	0.0229	0.0257

49	0.0675	0.0225	0.0450
50	0.0702	0.0222	0.0480
51	0.0756	0.0219	0.0537
52	0.0783	0.0216	0.0567
53	0.0918	0.0212	0.0706
54	0.0918	0.0209	0.0709
55	0.0621	0.0206	0.0415
56	0.0621	0.0203	0.0418
57	0.0729	0.0200	0.0529
58	0.0702	0.0197	0.0505
59	0.0702	0.0194	0.0508
60	0.0675	0.0191	0.0484
61	0.0648	0.0188	0.0460
62	0.0621	0.0185	0.0436
63	0.0513	0.0182	0.0331
64	0.0513	0.0180	0.0333
65	0.0108	0.0054	0.0054
66	0.0108	0.0054	0.0054
67	0.0081	0.0041	0.0041
68	0.0081	0.0041	0.0041
69	0.0135	0.0068	0.0068
70	0.0135	0.0068	0.0068
71	0.0135	0.0068	0.0068
72	0.0108	0.0054	0.0054
73	0.0108	0.0054	0.0054
74	0.0108	0.0054	0.0054
75	0.0081	0.0041	0.0041
76	0.0054	0.0027	0.0027
77	0.0081	0.0041	0.0041
78	0.0108	0.0054	0.0054
79	0.0081	0.0041	0.0041
80	0.0054	0.0027	0.0027
81	0.0081	0.0041	0.0041
82	0.0081	0.0041	0.0041
83	0.0081	0.0041	0.0041
84	0.0054	0.0027	0.0027
85	0.0081	0.0041	0.0041
86	0.0054	0.0027	0.0027
87	0.0081	0.0041	0.0041
88	0.0054	0.0027	0.0027
89	0.0081	0.0041	0.0041
90	0.0054	0.0027	0.0027
91	0.0054	0.0027	0.0027
92	0.0054	0.0027	0.0027
93	0.0054	0.0027	0.0027
94	0.0054	0.0027	0.0027
95	0.0054	0.0027	0.0027
96	0.0054	0.0027	0.0027

TOTAL STORM RAINFALL(INCHES) = 2.70
TOTAL SOIL-LOSS(INCHES) = 1.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.60

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.9908
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.8902

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0008	0.12	Q	.	.	.	.
0.167	0.0017	0.12	Q	.	.	.	.
0.250	0.0025	0.12	Q	.	.	.	.
0.333	0.0044	0.27	VQ	.	.	.	.
0.417	0.0063	0.27	VQ	.	.	.	.
0.500	0.0082	0.27	VQ	.	.	.	.
0.583	0.0105	0.34	VQ	.	.	.	.
0.667	0.0128	0.34	VQ	.	.	.	.
0.750	0.0151	0.34	VQ	.	.	.	.
0.833	0.0180	0.41	VQ	.	.	.	.
0.917	0.0208	0.41	VQ	.	.	.	.
1.000	0.0236	0.41	VQ	.	.	.	.
1.083	0.0264	0.40	VQ	.	.	.	.
1.167	0.0291	0.40	VQ	.	.	.	.
1.250	0.0319	0.40	VQ	.	.	.	.
1.333	0.0344	0.36	VQ	.	.	.	.
1.417	0.0369	0.36	VQ	.	.	.	.
1.500	0.0394	0.36	VQ	.	.	.	.
1.583	0.0418	0.36	VQ	.	.	.	.
1.667	0.0443	0.36	VQ	.	.	.	.
1.750	0.0467	0.36	VQ	.	.	.	.
1.833	0.0496	0.41	VQ	.	.	.	.
1.917	0.0524	0.41	VQ	.	.	.	.
2.000	0.0553	0.41	VQ	.	.	.	.
2.083	0.0585	0.46	VQ	.	.	.	.
2.167	0.0617	0.46	VQ	.	.	.	.
2.250	0.0648	0.46	VQ	.	.	.	.
2.333	0.0681	0.47	VQ	.	.	.	.
2.417	0.0713	0.47	VQ	.	.	.	.
2.500	0.0746	0.47	Q	.	.	.	.
2.583	0.0782	0.53	.VQ	.	.	.	.
2.667	0.0819	0.53	.VQ	.	.	.	.
2.750	0.0855	0.53	.VQ	.	.	.	.
2.833	0.0895	0.58	.VQ	.	.	.	.
2.917	0.0935	0.58	.VQ	.	.	.	.
3.000	0.0975	0.58	.VQ	.	.	.	.
3.083	0.1016	0.59	.VQ	.	.	.	.
3.167	0.1056	0.59	.VQ	.	.	.	.
3.250	0.1097	0.59	.VQ	.	.	.	.
3.333	0.1137	0.59	.VQ	.	.	.	.
3.417	0.1178	0.59	.VQ	.	.	.	.
3.500	0.1218	0.59	.VQ	.	.	.	.
3.583	0.1259	0.59	.VQ	.	.	.	.
3.667	0.1300	0.59	.VQ	.	.	.	.
3.750	0.1340	0.59	.VQ	.	.	.	.
3.833	0.1385	0.65	.VQ	.	.	.	.
3.917	0.1430	0.65	.VQ	.	.	.	.
4.000	0.1475	0.65	. Q	.	.	.	.
4.083	0.1523	0.70	. Q	.	.	.	.
4.167	0.1571	0.70	. Q	.	.	.	.
4.250	0.1619	0.70	. Q	.	.	.	.
4.333	0.1672	0.77	. VQ	.	.	.	.
4.417	0.1724	0.77	. VQ	.	.	.	.
4.500	0.1777	0.77	. VQ	.	.	.	.
4.583	0.1833	0.82	. VQ	.	.	.	.
4.667	0.1890	0.82	. VQ	.	.	.	.
4.750	0.1946	0.82	. VQ	.	.	.	.

4.833	0.2007	0.88	.	VQ	.	.	.	.
4.917	0.2067	0.88	.	VQ	.	.	.	.
5.000	0.2128	0.88	.	VQ	.	.	.	.
5.083	0.2184	0.81	.	Q	.	.	.	.
5.167	0.2240	0.81	.	Q	.	.	.	.
5.250	0.2296	0.81	.	Q	.	.	.	.
5.333	0.2351	0.79	.	Q	.	.	.	.
5.417	0.2405	0.79	.	Q	.	.	.	.
5.500	0.2459	0.79	.	Q	.	.	.	.
5.583	0.2520	0.88	.	Q	.	.	.	.
5.667	0.2580	0.88	.	Q	.	.	.	.
5.750	0.2641	0.88	.	Q	.	.	.	.
5.833	0.2705	0.93	.	Q	.	.	.	.
5.917	0.2769	0.93	.	Q	.	.	.	.
6.000	0.2834	0.93	.	Q	.	.	.	.
6.083	0.2903	1.00	.	Q	.	.	.	.
6.167	0.2972	1.00	.	Q	.	.	.	.
6.250	0.3041	1.00	.	Q	.	.	.	.
6.333	0.3113	1.05	.	Q	.	.	.	.
6.417	0.3185	1.05	.	Q	.	.	.	.
6.500	0.3258	1.05	.	Q	.	.	.	.
6.583	0.3335	1.12	.	Q	.	.	.	.
6.667	0.3412	1.12	.	Q	.	.	.	.
6.750	0.3489	1.12	.	Q	.	.	.	.
6.833	0.3570	1.17	.	Q	.	.	.	.
6.917	0.3650	1.17	.	QV	.	.	.	.
7.000	0.3731	1.17	.	QV	.	.	.	.
7.083	0.3812	1.18	.	QV	.	.	.	.
7.167	0.3893	1.18	.	QV	.	.	.	.
7.250	0.3974	1.18	.	QV	.	.	.	.
7.333	0.4060	1.24	.	QV	.	.	.	.
7.417	0.4145	1.24	.	QV	.	.	.	.
7.500	0.4230	1.24	.	QV	.	.	.	.
7.583	0.4323	1.35	.	Q	.	.	.	.
7.667	0.4416	1.35	.	QV	.	.	.	.
7.750	0.4509	1.35	.	QV	.	.	.	.
7.833	0.4610	1.46	.	QV	.	.	.	.
7.917	0.4711	1.46	.	QV	.	.	.	.
8.000	0.4811	1.46	.	QV	.	.	.	.
8.083	0.4924	1.64	.	Q	.	.	.	.
8.167	0.5037	1.64	.	Q	.	.	.	.
8.250	0.5150	1.64	.	QV	.	.	.	.
8.333	0.5271	1.75	.	QV	.	.	.	.
8.417	0.5391	1.75	.	QV	.	.	.	.
8.500	0.5511	1.75	.	QV	.	.	.	.
8.583	0.5637	1.83	.	Q	.	.	.	.
8.667	0.5763	1.83	.	Q	.	.	.	.
8.750	0.5888	1.83	.	QV	.	.	.	.
8.833	0.6022	1.94	.	QV	.	.	.	.
8.917	0.6155	1.94	.	QV	.	.	.	.
9.000	0.6289	1.94	.	QV	.	.	.	.
9.083	0.6434	2.11	.	Q	.	.	.	.
9.167	0.6580	2.11	.	QV	.	.	.	.
9.250	0.6725	2.11	.	QV	.	.	.	.
9.333	0.6884	2.30	.	Q	.	.	.	.
9.417	0.7043	2.30	.	Q	.	.	.	.
9.500	0.7201	2.30	.	Q	.	.	.	.
9.583	0.7375	2.52	.	Q	.	.	.	.
9.667	0.7549	2.52	.	Q	.	.	.	.
9.750	0.7723	2.52	.	Q	.	.	.	.
9.833	0.7915	2.78	.	VQ	.	.	.	.
9.917	0.8106	2.78	.	Q	.	.	.	.
10.000	0.8298	2.78	.	Q	.	.	.	.

```
10.083    0.8458    2.32  .        Q.V          .          .          .
10.167    0.8617    2.32  .        Q.V          .          .          .
10.250    0.8777    2.32  .        Q. V         .          .          .
10.333    0.8906    1.87  .      Q  . V         .          .          .
10.417    0.9035    1.87  .      Q  . V         .          .          .
10.500    0.9163    1.87  .      Q  . V         .          .          .
10.583    0.9315    2.20  .       Q . V         .          .          .
10.667    0.9467    2.20  .       Q .  V        .          .          .
10.750    0.9618    2.20  .       Q .  V        .          .          .
10.833    0.9792    2.52  .         Q  V        .          .          .
10.917    0.9965    2.52  .         Q  V        .          .          .
11.000    1.0138    2.52  .         Q   V       .          .          .
11.083    1.0309    2.48  .        Q.   V       .          .          .
11.167    1.0480    2.48  .        Q.   V       .          .          .
11.250    1.0651    2.48  .        Q.   V       .          .          .
11.333    1.0818    2.43  .        Q.   V       .          .          .
11.417    1.0985    2.43  .        Q.    V      .          .          .
11.500    1.1152    2.43  .        Q.    V      .          .          .
11.583    1.1304    2.21  .       Q .    V      .          .          .
11.667    1.1457    2.21  .       Q .    V      .          .          .
11.750    1.1609    2.21  .       Q .     V     .          .          .
11.833    1.1758    2.17  .       Q .     V     .          .          .
11.917    1.1908    2.17  .       Q .     V     .          .          .
12.000    1.2057    2.17  .       Q .     V     .          .          .
12.083    1.2270    3.09  .         . Q   V     .          .          .
12.167    1.2483    3.09  .         . Q    V    .          .          .
12.250    1.2696    3.09  .         . Q    V    .          .          .
12.333    1.2965    3.91  .         .    Q V    .          .          .
12.417    1.3235    3.91  .         .    Q  V   .          .          .
12.500    1.3504    3.91  .         .    Q  V   .          .          .
12.583    1.3807    4.39  .         .      Q V. .          .          .
12.667    1.4109    4.39  .         .      Q V. .          .          .
12.750    1.4412    4.39  .         .      Q V. .          .          .
12.833    1.4740    4.77  .         .        QV            .          .
12.917    1.5069    4.77  .         .        QV            .          .
13.000    1.5398    4.77  .         .        Q V           .          .
13.083    1.5779    5.54  .         .          .VQ         .          .
13.167    1.6161    5.54  .         .          . Q         .          .
13.250    1.6542    5.54  .         .          . Q         .          .
13.333    1.6960    6.07  .         .          .  VQ       .          .
13.417    1.7378    6.07  .         .          .   Q       .          .
13.500    1.7796    6.07  .         .          .   Q       .          .
13.583    1.8130    4.86  .         .        Q.    V       .          .
13.667    1.8465    4.86  .         .        Q.    V       .          .
13.750    1.8800    4.86  .         .        Q.     V      .          .
13.833    1.9067    3.87  .         .    Q   .     V       .          .
13.917    1.9333    3.87  .         .    Q   .     V       .          .
14.000    1.9600    3.87  .         .    Q   .      V      .          .
14.083    1.9889    4.20  .         .     Q  .      V      .          .
14.167    2.0179    4.20  .         .     Q  .      V      .          .
14.250    2.0468    4.20  .         .     Q  .       V     .          .
14.333    2.0774    4.45  .         .      Q .       V     .          .
14.417    2.1081    4.45  .         .      Q .        V.   .          .
14.500    2.1387    4.45  .         .      Q .        V.   .          .
14.583    2.1692    4.44  .         .      Q .         V   .          .
14.667    2.1998    4.44  .         .      Q .         V   .          .
14.750    2.2303    4.44  .         .      Q .         V   .          .
14.833    2.2602    4.34  .         .      Q .         .V  .          .
14.917    2.2901    4.34  .         .      Q .         .V  .          .
15.000    2.3199    4.34  .         .      Q .         . V .          .
15.083    2.3485    4.15  .         .     Q  .         . V .          .
15.167    2.3770    4.15  .         .     Q  .         . V .          .
15.250    2.4056    4.15  .         .     Q  .         .  V .         .
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15.333	2.4327	3.94	. . . Q . . V .
15.417	2.4599	3.94	. . . Q . . V .
15.500	2.4870	3.94	. . . Q . . V .
15.583	2.5102	3.37	. . Q . . V .
15.667	2.5334	3.37	. . Q . . V .
15.750	2.5566	3.37	. . Q . . V .
15.833	2.5772	2.99	. .Q . . V .
15.917	2.5979	2.99	. .Q . . V .
16.000	2.6185	2.99	. .Q . . V .
16.083	2.6301	1.69	. Q . . V .
16.167	2.6418	1.69	. Q . . V .
16.250	2.6535	1.69	. Q . . V .
16.333	2.6583	0.70	. Q . . V .
16.417	2.6631	0.70	. Q . . V .
16.500	2.6679	0.70	. Q . . V .
16.583	2.6712	0.47	.Q . . V .
16.667	2.6744	0.47	.Q . . V .
16.750	2.6776	0.47	.Q . . V .
16.833	2.6802	0.38	.Q . . V .
16.917	2.6828	0.38	.Q . . V .
17.000	2.6854	0.38	.Q . . V .
17.083	2.6888	0.48	.Q . . V .
17.167	2.6921	0.48	.Q . . V .
17.250	2.6954	0.48	.Q . . V .
17.333	2.6993	0.57	. Q . . V .
17.417	2.7033	0.57	. Q . . V .
17.500	2.7072	0.57	. Q . . V .
17.583	2.7112	0.59	. Q . . V .
17.667	2.7153	0.59	. Q . . V .
17.750	2.7193	0.59	. Q . . V .
17.833	2.7229	0.53	. Q . . V .
17.917	2.7266	0.53	. Q . . V .
18.000	2.7302	0.53	. Q . . V .
18.083	2.7336	0.48	.Q . . V .
18.167	2.7369	0.48	.Q . . V .
18.250	2.7402	0.48	.Q . . V .
18.333	2.7435	0.47	.Q . . V .
18.417	2.7468	0.47	.Q . . V .
18.500	2.7500	0.47	.Q . . V .
18.583	2.7529	0.41	.Q . . V .
18.667	2.7557	0.41	.Q . . V .
18.750	2.7586	0.41	.Q . . V .
18.833	2.7607	0.31	.Q . . V .
18.917	2.7628	0.31	.Q . . V .
19.000	2.7649	0.31	.Q . . V .
19.083	2.7670	0.31	.Q . . V .
19.167	2.7691	0.31	.Q . . V .
19.250	2.7713	0.31	.Q . . V .
19.333	2.7741	0.41	.Q . . V .
19.417	2.7769	0.41	.Q . . V .
19.500	2.7797	0.41	.Q . . V .
19.583	2.7824	0.40	.Q . . V .
19.667	2.7852	0.40	.Q . . V .
19.750	2.7879	0.40	.Q . . V .
19.833	2.7900	0.30	.Q . . V .
19.917	2.7921	0.30	.Q . . V .
20.000	2.7942	0.30	.Q . . V .
20.083	2.7963	0.31	.Q . . V .
20.167	2.7984	0.31	.Q . . V .
20.250	2.8005	0.31	.Q . . V .
20.333	2.8029	0.35	.Q . . V .
20.417	2.8053	0.35	.Q . . V .
20.500	2.8077	0.35	.Q . . V .

20.583	2.8101	0.35	.Q	.	.	.	V .
20.667	2.8126	0.35	.Q	.	.	.	V .
20.750	2.8150	0.35	.Q	.	.	.	V .
20.833	2.8170	0.29	.Q	.	.	.	V .
20.917	2.8190	0.29	.Q	.	.	.	V.
21.000	2.8211	0.29	.Q	.	.	.	V.
21.083	2.8232	0.31	.Q	.	.	.	V.
21.167	2.8253	0.31	.Q	.	.	.	V.
21.250	2.8274	0.31	.Q	.	.	.	V.
21.333	2.8294	0.29	.Q	.	.	.	V.
21.417	2.8313	0.29	.Q	.	.	.	V.
21.500	2.8333	0.29	.Q	.	.	.	V.
21.583	2.8354	0.31	.Q	.	.	.	V.
21.667	2.8375	0.31	.Q	.	.	.	V.
21.750	2.8396	0.31	.Q	.	.	.	V.
21.833	2.8416	0.29	.Q	.	.	.	V.
21.917	2.8435	0.29	.Q	.	.	.	V.
22.000	2.8455	0.29	.Q	.	.	.	V.
22.083	2.8476	0.30	.Q	.	.	.	V.
22.167	2.8497	0.30	.Q	.	.	.	V.
22.250	2.8518	0.30	.Q	.	.	.	V.
22.333	2.8538	0.29	.Q	.	.	.	V.
22.417	2.8557	0.29	.Q	.	.	.	V.
22.500	2.8577	0.29	.Q	.	.	.	V.
22.583	2.8594	0.24	Q	.	.	.	V.
22.667	2.8611	0.24	Q	.	.	.	V.
22.750	2.8628	0.24	Q	.	.	.	V.
22.833	2.8644	0.24	Q	.	.	.	V.
22.917	2.8661	0.24	Q	.	.	.	V.
23.000	2.8677	0.24	Q	.	.	.	V.
23.083	2.8693	0.24	Q	.	.	.	V.
23.166	2.8710	0.24	Q	.	.	.	V.
23.250	2.8726	0.24	Q	.	.	.	V.
23.333	2.8742	0.24	Q	.	.	.	V.
23.416	2.8758	0.24	Q	.	.	.	V.
23.500	2.8775	0.24	Q	.	.	.	V.
23.583	2.8791	0.24	Q	.	.	.	V.
23.666	2.8807	0.24	Q	.	.	.	V.
23.750	2.8824	0.24	Q	.	.	.	V.
23.833	2.8840	0.24	Q	.	.	.	V.
23.916	2.8856	0.24	Q	.	.	.	V.
24.000	2.8872	0.24	Q	.	.	.	V.
24.083	2.8880	0.12	Q	.	.	.	V.
24.166	2.8888	0.12	Q	.	.	.	V.
24.250	2.8896	0.12	Q	.	.	.	V.
24.333	2.8898	0.02	Q	.	.	.	V.
24.416	2.8899	0.02	Q	.	.	.	V.
24.500	2.8901	0.02	Q	.	.	.	V.
24.583	2.8901	0.01	Q	.	.	.	V.
24.666	2.8901	0.01	Q	.	.	.	V.
24.750	2.8902	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1485.0
10%	765.0
20%	540.0
30%	450.0

40%	300.0
50%	225.0
60%	195.0
70%	120.0
80%	45.0
90%	30.0

END OF FLOODSCX ROUTING ANALYSIS

100-YEAR FREQUENCY

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:


 ************************* DESCRIPTION OF STUDY **************************
* 100-YEAR, 1 HOUR, NO BYPASS                                            *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 08:22 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE     100.00 TO NODE     101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.20 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

1	13.994	36.725
2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0516	0.0081	0.0435
2	0.0546	0.0081	0.0465
3	0.0581	0.0081	0.0501
4	0.0644	0.0081	0.0563
5	0.0681	0.0081	0.0600
6	0.0779	0.0081	0.0698
7	0.0920	0.0081	0.0839
8	0.1015	0.0081	0.0934
9	0.1554	0.0081	0.1473
10	0.3345	0.0081	0.3264
11	0.0849	0.0081	0.0768
12	0.0572	0.0081	0.0491

TOTAL STORM RAINFALL(INCHES) = 1.20
TOTAL SOIL-LOSS(INCHES) = 0.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.10

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.1754
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.9936

---

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 15.0 30.0 45.0 60.0
0.083	0.0110	1.60	VQ . . . .
0.167	0.0586	6.92	.V Q . . . .
0.250	0.1247	9.59	. V Q . . . .
0.333	0.2026	11.31	. V Q . . . .
0.417	0.2919	12.97	. V Q . . . .
0.500	0.3921	14.55	. V Q. . . .
0.583	0.5083	16.87	. VQ . . .
0.667	0.6444	19.76	. . VQ . . .
0.750	0.8096	23.99	. . QV . . .

```
0.833    1.0718    38.07  .          .          .V   Q     .          .
0.917    1.4412    53.63  .          .          .        V .    Q     .
1.000    1.6695    33.16  .          .          . Q        .  V       .
1.083    1.8082    20.13  .          .  Q       .          .    V     .
1.167    1.8798    10.40  .     Q    .          .          .      V   .
1.250    1.9221     6.14  .   Q      .          .          .        V .
1.333    1.9497     4.00  . Q        .          .          .         V.
1.417    1.9673     2.56  .Q         .          .          .         V.
1.500    1.9777     1.51  .Q         .          .          .         V.
1.583    1.9849     1.05  Q          .          .          .         V.
1.667    1.9896     0.67  Q          .          .          .         V.
1.750    1.9921     0.37  Q          .          .          .         V.
1.833    1.9932     0.16  Q          .          .          .         V.
1.917    1.9935     0.04  Q          .          .          .         V.
2.000    1.9936     0.01  Q          .          .          .          V
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	120.0
10%	70.0
20%	50.0
30%	35.0
40%	20.0
50%	15.0
60%	15.0
70%	10.0
80%	5.0
90%	5.0

END OF FLOODSCX ROUTING ANALYSIS

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
             Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 100-YEAR, 3 HOUR, NO BYPASS                                            *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 08:06 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE     100.00 TO NODE     101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.85 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
       1                13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

†
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0240	0.0081	0.0160
2	0.0240	0.0081	0.0160
3	0.0203	0.0081	0.0123
4	0.0278	0.0081	0.0197
5	0.0278	0.0081	0.0197
6	0.0333	0.0081	0.0252
7	0.0278	0.0081	0.0197
8	0.0333	0.0081	0.0252
9	0.0333	0.0081	0.0252
10	0.0278	0.0081	0.0197
11	0.0296	0.0081	0.0215
12	0.0333	0.0081	0.0252
13	0.0407	0.0081	0.0326
14	0.0407	0.0081	0.0326
15	0.0407	0.0081	0.0326
16	0.0370	0.0081	0.0289
17	0.0481	0.0081	0.0400
18	0.0499	0.0081	0.0419
19	0.0444	0.0081	0.0363
20	0.0499	0.0081	0.0419
21	0.0611	0.0081	0.0530
22	0.0573	0.0081	0.0493
23	0.0537	0.0081	0.0456
24	0.0555	0.0081	0.0474
25	0.0573	0.0081	0.0493
26	0.0777	0.0081	0.0696
27	0.0925	0.0081	0.0844
28	0.0648	0.0081	0.0567
29	0.1258	0.0081	0.1177
30	0.1350	0.0081	0.1270
31	0.1517	0.0081	0.1436
32	0.1091	0.0081	0.1011
33	0.0370	0.0081	0.0289
34	0.0333	0.0081	0.0252
35	0.0333	0.0081	0.0252
36	0.0111	0.0056	0.0056

TOTAL STORM RAINFALL(INCHES) = 1.85
TOTAL SOIL-LOSS(INCHES) = 0.29
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.56

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.5216

F100Y3H.RES

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.8223

♀

3 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 10.0 20.0 30.0 40.0
0.083	0.0040	0.59	Q
0.167	0.0213	2.50	V Q
0.250	0.0431	3.17	V Q
0.333	0.0660	3.33	V Q
0.417	0.0951	4.22	.V Q
0.500	0.1285	4.85	.V Q
0.583	0.1665	5.51	. V Q
0.667	0.2040	5.45	. V Q
0.750	0.2454	6.02	. V Q
0.833	0.2874	6.10	. V Q
0.917	0.3262	5.63	. VQ
1.000	0.3660	5.78	. Q
1.083	0.4109	6.52	. VQ
1.167	0.4631	7.59	. VQ
1.250	0.5185	8.04	. VQ
1.333	0.5742	8.09	. Q
1.417	0.6305	8.17	. Q
1.500	0.6957	9.47	. Q.
1.583	0.7647	10.02	. Q
1.667	0.8327	9.87	. Q.V
1.750	0.9072	10.82	. Q V
1.833	0.9918	12.29	. Q V
1.917	1.0771	12.39	. Q V
2.000	1.1607	12.13	. Q V
2.083	1.2456	12.33	. Q V
2.167	1.3378	13.39	. Q V
2.250	1.4515	16.51	. Q V
2.333	1.5778	18.35	. Q . V
2.417	1.7050	18.46	. Q . V
2.500	1.8793	25.31	. QV
2.583	2.0850	29.88	. Q.
2.667	2.3051	31.95	. .QV
2.750	2.4836	25.92	. Q V
2.833	2.5930	15.89	. Q V
2.917	2.6723	11.51	.Q V
3.000	2.7341	8.98	. Q . V
3.083	2.7709	5.33	. Q . V.
3.167	2.7913	2.97	. Q . V.
3.250	2.8036	1.78	.Q . V.
3.333	2.8114	1.13	.Q . V.
3.417	2.8165	0.74	Q . V.
3.500	2.8194	0.43	Q . V.
3.583	2.8209	0.22	Q . V.
3.667	2.8217	0.11	Q . V.
3.750	2.8221	0.06	Q . V.
3.833	2.8223	0.03	Q . V.
3.917	2.8223	0.01	Q . V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:

(Note: 100% of Peak Flow Rate estimate assumed to have an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	235.0
10%	170.0
20%	120.0
30%	85.0
40%	45.0
50%	35.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

END OF FLOODSCX ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                      Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 100-YEAR, 6 HOUR NO OUTLET (26 CFS)                                   *
*                                                                       *
*                                                                       *
 ************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 08:30 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.50 INCHES
         RCFC&WCD 6-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
       1                13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0125	0.0063	0.0063
2	0.0150	0.0075	0.0075
3	0.0150	0.0075	0.0075
4	0.0150	0.0075	0.0075
5	0.0150	0.0075	0.0075
6	0.0175	0.0081	0.0094
7	0.0175	0.0081	0.0094
8	0.0175	0.0081	0.0094
9	0.0175	0.0081	0.0094
10	0.0175	0.0081	0.0094
11	0.0175	0.0081	0.0094
12	0.0200	0.0081	0.0119
13	0.0200	0.0081	0.0119
14	0.0200	0.0081	0.0119
15	0.0200	0.0081	0.0119
16	0.0200	0.0081	0.0119
17	0.0200	0.0081	0.0119
18	0.0200	0.0081	0.0119
19	0.0200	0.0081	0.0119
20	0.0200	0.0081	0.0119
21	0.0200	0.0081	0.0119
22	0.0200	0.0081	0.0119
23	0.0200	0.0081	0.0119
24	0.0225	0.0081	0.0144
25	0.0200	0.0081	0.0119
26	0.0225	0.0081	0.0144
27	0.0225	0.0081	0.0144
28	0.0225	0.0081	0.0144
29	0.0225	0.0081	0.0144
30	0.0225	0.0081	0.0144
31	0.0225	0.0081	0.0144
32	0.0225	0.0081	0.0144
33	0.0250	0.0081	0.0169
34	0.0250	0.0081	0.0169
35	0.0250	0.0081	0.0169
36	0.0250	0.0081	0.0169
37	0.0250	0.0081	0.0169
38	0.0275	0.0081	0.0194
39	0.0275	0.0081	0.0194
40	0.0275	0.0081	0.0194
41	0.0300	0.0081	0.0219
42	0.0325	0.0081	0.0244
43	0.0350	0.0081	0.0269

44	0.0350	0.0081	0.0269
45	0.0375	0.0081	0.0294
46	0.0375	0.0081	0.0294
47	0.0400	0.0081	0.0319
48	0.0400	0.0081	0.0319
49	0.0425	0.0081	0.0344
50	0.0450	0.0081	0.0369
51	0.0475	0.0081	0.0394
52	0.0500	0.0081	0.0419
53	0.0525	0.0081	0.0444
54	0.0525	0.0081	0.0444
55	0.0550	0.0081	0.0469
56	0.0575	0.0081	0.0494
57	0.0600	0.0081	0.0519
58	0.0600	0.0081	0.0519
59	0.0625	0.0081	0.0544
60	0.0650	0.0081	0.0569
61	0.0775	0.0081	0.0694
62	0.0900	0.0081	0.0819
63	0.0975	0.0081	0.0894
64	0.1050	0.0081	0.0969
65	0.1175	0.0081	0.1094
66	0.1400	0.0081	0.1319
67	0.0475	0.0081	0.0394
68	0.0225	0.0081	0.0144
69	0.0150	0.0075	0.0075
70	0.0125	0.0063	0.0063
71	0.0075	0.0038	0.0038
72	0.0050	0.0025	0.0025

TOTAL STORM RAINFALL(INCHES) = 2.50
TOTAL SOIL-LOSS(INCHES) = 0.57
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.93

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.0226
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.4964

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†

6 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	7.5	15.0	22.5	30.0
0.083	0.0016	0.23	Q	.	.	.	.
0.167	0.0086	1.02	VQ	.	.	.	.
0.250	0.0189	1.49	VQ	.	.	.	.
0.333	0.0305	1.68	V Q	.	.	.	.
0.417	0.0428	1.78	V Q	.	.	.	.
0.500	0.0560	1.92	V Q	.	.	.	.
0.583	0.0711	2.20	V Q	.	.	.	.
0.667	0.0871	2.32	V Q	.	.	.	.
0.750	0.1035	2.38	.V Q	.	.	.	.
0.833	0.1201	2.41	.V Q	.	.	.	.
0.917	0.1369	2.44	.V Q	.	.	.	.
1.000	0.1544	2.54	.V Q	.	.	.	.
1.083	0.1740	2.85	.V Q	.	.	.	.

1.167	0.1946	2.98	. VQ . . . .
1.250	0.2155	3.04	. V Q . . . .
1.333	0.2366	3.07	. V Q . . . .
1.417	0.2579	3.09	. V Q . . . .
1.500	0.2793	3.11	. VQ . . . .
1.583	0.3007	3.11	. VQ . . . .
1.667	0.3222	3.12	. VQ . . . .
1.750	0.3437	3.12	. VQ . . . .
1.833	0.3652	3.13	. Q . . . .
1.917	0.3868	3.13	. Q . . . .
2.000	0.4090	3.22	. Q . . . .
2.083	0.4326	3.43	. Q . . . .
2.167	0.4556	3.34	. QV . . . .
2.250	0.4802	3.57	. QV . . . .
2.333	0.5055	3.67	. QV . . . .
2.417	0.5311	3.72	. Q V . . . .
2.500	0.5569	3.74	. Q V . . . .
2.583	0.5827	3.76	. QV . . . .
2.667	0.6087	3.77	. QV . . . .
2.750	0.6353	3.87	. Q V . . . .
2.833	0.6640	4.17	. Q V . . . .
2.917	0.6936	4.30	. Q V . . . .
3.000	0.7236	4.35	. Q V . . . .
3.083	0.7538	4.38	. Q V . . . .
3.167	0.7847	4.50	. Q V . . . .
3.250	0.8178	4.81	. Q V. . . . .
3.333	0.8519	4.94	. Q V. . . . .
3.417	0.8869	5.09	. Q V . . . .
3.500	0.9250	5.52	. Q V . . . .
3.583	0.9667	6.06	. Q .V . . . .
3.667	1.0118	6.55	. Q .V . . . .
3.750	1.0590	6.86	. Q. V . . . .
3.833	1.1091	7.27	. Q. V . . . .
3.917	1.1611	7.55	. Q V . . . .
4.000	1.2159	7.95	. Q V . . . .
4.083	1.2725	8.23	. Q V . . . .
4.167	1.3325	8.71	. .Q V . . . .
4.250	1.3965	9.28	. . Q V . . . .
4.333	1.4646	9.89	. . Q V . . . .
4.417	1.5370	10.51	. . Q V . . . .
4.500	1.6131	11.06	. . Q V . . . .
4.583	1.6916	11.40	. . Q V. . . . .
4.667	1.7737	11.92	. . Q V . . . .
4.750	1.8599	12.52	. . Q .V . . . .
4.833	1.9498	13.05	. . Q . V . . . .
4.917	2.0420	13.38	. . Q . V . . . .
5.000	2.1377	13.90	. . Q . V . . . .
5.083	2.2401	14.86	. . Q. V . . . .
5.167	2.3575	17.05	. . . Q V . . . .
5.250	2.4923	19.57	. . . Q V . . . .
5.333	2.6417	21.70	. . . Q V . . . .
5.417	2.8063	23.89	. . . .QV . . . .
5.500	2.9925	27.04	. . . . V Q . . . .
5.583	3.1812	27.40	. . . . Q . . . .
5.667	3.2987	17.07	. . . Q . . V . .
5.750	3.3674	9.97	. . Q . . . V . .
5.833	3.4115	6.40	. Q . . . . V.
5.917	3.4424	4.48	. Q . . . . V.
6.000	3.4637	3.09	. Q . . . . V.
6.083	3.4776	2.03	. Q . . . . V.
6.167	3.4855	1.14	.Q . . . . V.
6.250	3.4903	0.71	Q . . . . V.
6.333	3.4933	0.44	Q . . . . V.

6.417	3.4950	0.24	Q	.	.	.	V.
6.500	3.4958	0.11	Q	.	.	.	V.
6.583	3.4961	0.05	Q	.	.	.	V.
6.667	3.4963	0.02	Q	.	.	.	V.
6.750	3.4964	0.01	Q	.	.	.	V.
6.833	3.4964	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	410.0
10%	300.0
20%	145.0
30%	105.0
40%	75.0
50%	45.0
60%	35.0
70%	25.0
80%	15.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* 100-YEAR, 24 HOUR, NO BYPASS                                            *
*                                                                         *
* JULY 29, 2013                                                           *
 **************************************************************************

  FILE NAME: FLODA.DAT
  TIME/DATE OF STUDY: 11:32 07/29/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.049
         USER-ENTERED RAINFALL =  4.00 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 250.000


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                      UNIT HYDROGRAPH DETERMINATION

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    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
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1	50.817	44.454
2	90.903	35.066
3	97.798	6.031
4	99.444	1.441
5	99.778	0.292
6	99.944	0.146
7	100.000	0.049

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UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0080	0.0040	0.0040
2	0.0120	0.0060	0.0060
3	0.0120	0.0060	0.0060
4	0.0160	0.0080	0.0080
5	0.0120	0.0060	0.0060
6	0.0120	0.0060	0.0060
7	0.0120	0.0060	0.0060
8	0.0160	0.0080	0.0080
9	0.0160	0.0080	0.0080
10	0.0160	0.0080	0.0080
11	0.0200	0.0100	0.0100
12	0.0200	0.0100	0.0100
13	0.0200	0.0100	0.0100
14	0.0200	0.0100	0.0100
15	0.0200	0.0100	0.0100
16	0.0240	0.0120	0.0120
17	0.0240	0.0120	0.0120
18	0.0280	0.0140	0.0140
19	0.0280	0.0140	0.0140
20	0.0320	0.0160	0.0160
21	0.0240	0.0120	0.0120
22	0.0280	0.0140	0.0140
23	0.0320	0.0160	0.0160
24	0.0320	0.0160	0.0160
25	0.0360	0.0180	0.0180
26	0.0360	0.0180	0.0180
27	0.0400	0.0200	0.0200
28	0.0400	0.0200	0.0200
29	0.0400	0.0200	0.0200
30	0.0440	0.0220	0.0220
31	0.0480	0.0240	0.0240
32	0.0520	0.0260	0.0260
33	0.0600	0.0284	0.0316
34	0.0600	0.0280	0.0320
35	0.0640	0.0276	0.0364
36	0.0680	0.0272	0.0408
37	0.0760	0.0268	0.0492
38	0.0800	0.0265	0.0535
39	0.0840	0.0261	0.0579
40	0.0880	0.0257	0.0623
41	0.0600	0.0253	0.0347
42	0.0600	0.0250	0.0350
43	0.0800	0.0246	0.0554
44	0.0800	0.0243	0.0557
45	0.0760	0.0239	0.0521
46	0.0760	0.0236	0.0524
47	0.0680	0.0232	0.0448
48	0.0720	0.0229	0.0491

49	0.1000	0.0225	0.0775
50	0.1040	0.0222	0.0818
51	0.1120	0.0219	0.0901
52	0.1160	0.0216	0.0944
53	0.1360	0.0212	0.1148
54	0.1360	0.0209	0.1151
55	0.0920	0.0206	0.0714
56	0.0920	0.0203	0.0717
57	0.1080	0.0200	0.0880
58	0.1040	0.0197	0.0843
59	0.1040	0.0194	0.0846
60	0.1000	0.0191	0.0809
61	0.0960	0.0188	0.0772
62	0.0920	0.0185	0.0735
63	0.0760	0.0182	0.0578
64	0.0760	0.0180	0.0580
65	0.0160	0.0080	0.0080
66	0.0160	0.0080	0.0080
67	0.0120	0.0060	0.0060
68	0.0120	0.0060	0.0060
69	0.0200	0.0100	0.0100
70	0.0200	0.0100	0.0100
71	0.0200	0.0100	0.0100
72	0.0160	0.0080	0.0080
73	0.0160	0.0080	0.0080
74	0.0160	0.0080	0.0080
75	0.0120	0.0060	0.0060
76	0.0080	0.0040	0.0040
77	0.0120	0.0060	0.0060
78	0.0160	0.0080	0.0080
79	0.0120	0.0060	0.0060
80	0.0080	0.0040	0.0040
81	0.0120	0.0060	0.0060
82	0.0120	0.0060	0.0060
83	0.0120	0.0060	0.0060
84	0.0080	0.0040	0.0040
85	0.0120	0.0060	0.0060
86	0.0080	0.0040	0.0040
87	0.0120	0.0060	0.0060
88	0.0080	0.0040	0.0040
89	0.0120	0.0060	0.0060
90	0.0080	0.0040	0.0040
91	0.0080	0.0040	0.0040
92	0.0080	0.0040	0.0040
93	0.0080	0.0040	0.0040
94	0.0080	0.0040	0.0040
95	0.0080	0.0040	0.0040
96	0.0080	0.0040	0.0040

TOTAL STORM RAINFALL(INCHES) = 4.00
TOTAL SOIL-LOSS(INCHES) = 1.33
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.67

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.4123
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 4.8185

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0012	0.18	Q	.	.	.	.
0.167	0.0024	0.18	Q	.	.	.	.
0.250	0.0037	0.18	Q	.	.	.	.
0.333	0.0065	0.41	VQ	.	.	.	.
0.417	0.0093	0.41	VQ	.	.	.	.
0.500	0.0121	0.41	VQ	.	.	.	.
0.583	0.0155	0.50	V Q	.	.	.	.
0.667	0.0190	0.50	V Q	.	.	.	.
0.750	0.0224	0.50	V Q	.	.	.	.
0.833	0.0266	0.61	V Q	.	.	.	.
0.917	0.0308	0.61	V Q	.	.	.	.
1.000	0.0350	0.61	V Q	.	.	.	.
1.083	0.0391	0.59	V Q	.	.	.	.
1.167	0.0432	0.59	V Q	.	.	.	.
1.250	0.0473	0.59	V Q	.	.	.	.
1.333	0.0510	0.54	V Q	.	.	.	.
1.417	0.0546	0.54	V Q	.	.	.	.
1.500	0.0583	0.54	V Q	.	.	.	.
1.583	0.0620	0.53	V Q	.	.	.	.
1.667	0.0656	0.53	V Q	.	.	.	.
1.750	0.0692	0.53	V Q	.	.	.	.
1.833	0.0735	0.61	V Q	.	.	.	.
1.917	0.0777	0.61	V Q	.	.	.	.
2.000	0.0819	0.61	V Q	.	.	.	.
2.083	0.0866	0.68	V Q	.	.	.	.
2.167	0.0914	0.68	V Q	.	.	.	.
2.250	0.0961	0.68	V Q	.	.	.	.
2.333	0.1009	0.70	V Q	.	.	.	.
2.417	0.1057	0.70	V Q	.	.	.	.
2.500	0.1105	0.70	V Q	.	.	.	.
2.583	0.1159	0.79	V Q	.	.	.	.
2.667	0.1213	0.79	V Q	.	.	.	.
2.750	0.1267	0.79	V Q	.	.	.	.
2.833	0.1326	0.86	.V Q	.	.	.	.
2.917	0.1386	0.86	.V Q	.	.	.	.
3.000	0.1445	0.86	.V Q	.	.	.	.
3.083	0.1505	0.87	.V Q	.	.	.	.
3.167	0.1565	0.87	.V Q	.	.	.	.
3.250	0.1625	0.87	.V Q	.	.	.	.
3.333	0.1685	0.87	.V Q	.	.	.	.
3.417	0.1745	0.87	.V Q	.	.	.	.
3.500	0.1805	0.87	.V Q	.	.	.	.
3.583	0.1865	0.87	.V Q	.	.	.	.
3.667	0.1926	0.87	.V Q	.	.	.	.
3.750	0.1986	0.87	.V Q	.	.	.	.
3.833	0.2052	0.96	.V Q	.	.	.	.
3.917	0.2119	0.96	.V Q	.	.	.	.
4.000	0.2185	0.96	.V Q	.	.	.	.
4.083	0.2256	1.03	.V Q	.	.	.	.
4.167	0.2327	1.03	.V Q	.	.	.	.
4.250	0.2398	1.03	.V Q	.	.	.	.
4.333	0.2477	1.13	. V Q	.	.	.	.
4.417	0.2555	1.13	. V Q	.	.	.	.
4.500	0.2633	1.13	. V Q	.	.	.	.
4.583	0.2716	1.21	. V Q	.	.	.	.
4.667	0.2799	1.21	. V Q	.	.	.	.
4.750	0.2882	1.21	. V Q	.	.	.	.

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 4.833      0.2973      1.31  . V  Q     .          .          .          .
 4.917      0.3063      1.31  . V  Q     .          .          .          .
 5.000      0.3153      1.31  . V  Q     .          .          .          .
 5.083      0.3236      1.20  . V Q      .          .          .          .
 5.167      0.3319      1.20  . V Q      .          .          .          .
 5.250      0.3402      1.20  . V Q      .          .          .          .
 5.333      0.3482      1.17  . V Q      .          .          .          .
 5.417      0.3563      1.17  . V Q      .          .          .          .
 5.500      0.3643      1.17  .  VQ      .          .          .          .
 5.583      0.3733      1.30  .  V Q     .          .          .          .
 5.667      0.3823      1.30  .  V Q     .          .          .          .
 5.750      0.3912      1.30  .  V Q     .          .          .          .
 5.833      0.4008      1.38  .  V Q     .          .          .          .
 5.917      0.4103      1.38  .  V Q     .          .          .          .
 6.000      0.4198      1.38  .  V Q     .          .          .          .
 6.083      0.4300      1.48  .  V Q     .          .          .          .
 6.167      0.4402      1.48  .  V Q     .          .          .          .
 6.250      0.4505      1.48  .  V Q     .          .          .          .
 6.333      0.4612      1.56  .  V  Q    .          .          .          .
 6.417      0.4719      1.56  .  V  Q    .          .          .          .
 6.500      0.4826      1.56  .   V Q    .          .          .          .
 6.583      0.4941      1.66  .   V Q    .          .          .          .
 6.667      0.5055      1.66  .   V Q    .          .          .          .
 6.750      0.5169      1.66  .   V Q    .          .          .          .
 6.833      0.5288      1.73  .   V Q    .          .          .          .
 6.917      0.5408      1.73  .   V Q    .          .          .          .
 7.000      0.5527      1.73  .   V Q    .          .          .          .
 7.083      0.5647      1.75  .   V Q    .          .          .          .
 7.167      0.5767      1.75  .   V Q    .          .          .          .
 7.250      0.5888      1.75  .   V Q    .          .          .          .
 7.333      0.6014      1.84  .   V  Q   .          .          .          .
 7.417      0.6141      1.84  .    V Q   .          .          .          .
 7.500      0.6267      1.84  .    V Q   .          .          .          .
 7.583      0.6405      2.00  .    V Q   .          .          .          .
 7.667      0.6542      2.00  .    V Q   .          .          .          .
 7.750      0.6680      2.00  .    V Q   .          .          .          .
 7.833      0.6829      2.17  .    V  Q  .          .          .          .
 7.917      0.6979      2.17  .    V  Q  .          .          .          .
 8.000      0.7128      2.17  .    V  Q  .          .          .          .
 8.083      0.7300      2.50  .     V   Q           .          .          .
 8.167      0.7473      2.50  .     V   Q           .          .          .
 8.250      0.7645      2.50  .     V   Q           .          .          .
 8.333      0.7833      2.73  .     V   Q           .          .          .
 8.417      0.8022      2.73  .     V   Q           .          .          .
 8.500      0.8210      2.73  .     V   Q           .          .          .
 8.583      0.8415      2.98  .     V   .Q          .          .          .
 8.667      0.8620      2.98  .      V  .Q          .          .          .
 8.750      0.8825      2.98  .      V  .Q          .          .          .
 8.833      0.9055      3.34  .      V  .  Q        .          .          .
 8.917      0.9285      3.34  .      V  .  Q        .          .          .
 9.000      0.9515      3.34  .      V  .  Q        .          .          .
 9.083      0.9784      3.89  .       V .    Q      .          .          .
 9.167      1.0052      3.89  .       V .    Q      .          .          .
 9.250      1.0320      3.89  .       V .    Q      .          .          .
 9.333      1.0624      4.42  .       V .      Q    .          .          .
 9.417      1.0928      4.42  .        V.      Q    .          .          .
 9.500      1.1233      4.42  .        V.      Q    .          .          .
 9.583      1.1565      4.82  .        V.        Q. .          .          .
 9.667      1.1897      4.82  .        V.        Q. .          .          .
 9.750      1.2229      4.82  .         V        Q. .          .          .
 9.833      1.2588      5.21  .         V         Q .          .          .
 9.917      1.2947      5.21  .         V         Q .          .          .
10.000      1.3306      5.21  .          V        Q .          .          .
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10.083    1.3594    4.17  .         .V    Q   .         .         .
10.167    1.3881    4.17  .         .V    Q   .         .         .
10.250    1.4168    4.17  .         .V    Q   .         .         .
10.333    1.4393    3.26  .         .V Q      .         .         .
10.417    1.4617    3.26  .         . VQ      .         .         .
10.500    1.4841    3.26  .         . VQ      .         .         .
10.583    1.5118    4.02  .         . V   Q   .         .         .
10.667    1.5394    4.02  .         . V   Q   .         .         .
10.750    1.5671    4.02  .         .  V  Q   .         .         .
10.833    1.5995    4.71  .         .  V    Q .         .         .
10.917    1.6319    4.71  .         .  V    Q .         .         .
11.000    1.6644    4.71  .         .  V    Q .         .         .
11.083    1.6966    4.68  .         .   V   Q .         .         .
11.167    1.7288    4.68  .         .   V   Q .         .         .
11.250    1.7610    4.68  .         .   V   Q .         .         .
11.333    1.7926    4.59  .         .   V   Q .         .         .
11.417    1.8242    4.59  .         .    V  Q .         .         .
11.500    1.8558    4.59  .         .    V  Q .         .         .
11.583    1.8851    4.25  .         .    VQ   .         .         .
11.667    1.9143    4.25  .         .    VQ   .         .         .
11.750    1.9436    4.25  .         .     Q   .         .         .
11.833    1.9723    4.17  .         .     Q   .         .         .
11.917    2.0010    4.17  .         .     Q   .         .         .
12.000    2.0298    4.17  .         .     Q   .         .         .
12.083    2.0679    5.54  .         .      V  . Q       .         .
12.167    2.1060    5.54  .         .      V  . Q       .         .
12.250    2.1442    5.54  .         .      V  . Q       .         .
12.333    2.1906    6.74  .         .       V .     Q   .         .
12.417    2.2370    6.74  .         .       V .     Q   .         .
12.500    2.2834    6.74  .         .       V .     Q   .         .
12.583    2.3346    7.44  .         .        V.         Q.        .
12.667    2.3858    7.44  .         .        V.         Q.        .
12.750    2.4370    7.44  .         .         V         Q.        .
12.833    2.4920    7.99  .         .         V          .Q       .
12.917    2.5470    7.99  .         .          V         .Q       .
13.000    2.6021    7.99  .         .          V         .Q       .
13.083    2.6648    9.11  .         .          . V       .     Q  .
13.167    2.7275    9.11  .         .          . V       .     Q  .
13.250    2.7902    9.11  .         .           . V      .     Q  .
13.333    2.8583    9.88  .         .           . V      .        Q.
13.417    2.9263    9.88  .         .            V       .        Q.
13.500    2.9943    9.88  .         .            V       .        Q.
13.583    3.0500    8.08  .         .             V    . Q        .
13.667    3.1056    8.08  .         .             V    . Q        .
13.750    3.1613    8.08  .         .              V   . Q        .
13.833    3.2067    6.60  .         .              Q   .          .
13.917    3.2521    6.60  .         .              Q   .          .
14.000    3.2975    6.60  .         .              QV  .          .
14.083    3.3463    7.08  .         .               VQ .          .
14.167    3.3950    7.08  .         .                Q .          .
14.250    3.4437    7.08  .         .                Q .          .
14.333    3.4949    7.43  .         .                 Q.          .
14.417    3.5460    7.43  .         .                 Q.          .
14.500    3.5971    7.43  .         .                 Q.          .
14.583    3.6481    7.40  .         .                 QV          .
14.667    3.6990    7.40  .         .                 QV          .
14.750    3.7499    7.40  .         .                 Q V         .
14.833    3.7998    7.24  .         .               Q .V          .
14.917    3.8496    7.24  .         .               Q .V          .
15.000    3.8994    7.24  .         .               Q . V         .
15.083    3.9472    6.94  .         .             Q   . V         .
15.167    3.9950    6.94  .         .             Q   .  V        .
15.250    4.0428    6.94  .         .             Q   .  V        .
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15.333    4.0884    6.62  .          .          .     Q    .  V       .
15.417    4.1341    6.62  .          .          .     Q    .   V      .
15.500    4.1797    6.62  .          .          .     Q    .   V      .
15.583    4.2194    5.77  .          .          .  Q       .    V     .
15.667    4.2591    5.77  .          .          .  Q       .    V     .
15.750    4.2989    5.77  .          .          .  Q       .    V     .
15.833    4.3347    5.20  .          .       Q             .    V     .
15.917    4.3705    5.20  .          .       Q             .     V    .
16.000    4.4063    5.20  .          .       Q             .     V    .
16.083    4.4262    2.88  .         .Q       .             .     V    .
16.167    4.4460    2.88  .         .Q       .             .     V    .
16.250    4.4659    2.88  .         .Q       .             .      V   .
16.333    4.4735    1.11  .   Q     .        .             .      V   .
16.417    4.4811    1.11  .   Q     .        .             .      V   .
16.500    4.4887    1.11  .   Q     .        .             .      V   .
16.583    4.4936    0.71  . Q       .        .             .      V   .
16.667    4.4985    0.71  . Q       .        .             .      V   .
16.750    4.5034    0.71  . Q       .        .             .      V   .
16.833    4.5073    0.57  . Q       .        .             .      V   .
16.917    4.5112    0.57  . Q       .        .             .      V   .
17.000    4.5151    0.57  . Q       .        .             .      V   .
17.083    4.5200    0.72  . Q       .        .             .      V   .
17.167    4.5250    0.72  . Q       .        .             .      V   .
17.250    4.5299    0.72  . Q       .        .             .      V   .
17.333    4.5357    0.85  .  Q      .        .             .      V   .
17.417    4.5415    0.85  .  Q      .        .             .      V   .
17.500    4.5474    0.85  .  Q      .        .             .      V   .
17.583    4.5533    0.87  .  Q      .        .             .      V   .
17.667    4.5593    0.87  .  Q      .        .             .      V   .
17.750    4.5653    0.87  .  Q      .        .             .      V   .
17.833    4.5707    0.78  .  Q      .        .             .      V   .
17.917    4.5761    0.78  .  Q      .        .             .      V   .
18.000    4.5815    0.78  .  Q      .        .             .       V  .
18.083    4.5864    0.71  . Q       .        .             .       V  .
18.167    4.5913    0.71  . Q       .        .             .       V  .
18.250    4.5963    0.71  . Q       .        .             .       V  .
18.333    4.6011    0.70  . Q       .        .             .       V  .
18.417    4.6060    0.70  . Q       .        .             .       V  .
18.500    4.6108    0.70  . Q       .        .             .       V  .
18.583    4.6150    0.61  . Q       .        .             .       V  .
18.667    4.6192    0.61  . Q       .        .             .       V  .
18.750    4.6234    0.61  . Q       .        .             .       V  .
18.833    4.6266    0.45  .Q        .        .             .       V  .
18.917    4.6297    0.45  .Q        .        .             .       V  .
19.000    4.6328    0.45  .Q        .        .             .       V  .
19.083    4.6359    0.46  .Q        .        .             .       V  .
19.167    4.6391    0.46  .Q        .        .             .       V  .
19.250    4.6423    0.46  .Q        .        .             .       V  .
19.333    4.6464    0.60  . Q       .        .             .       V  .
19.417    4.6506    0.60  . Q       .        .             .       V  .
19.500    4.6547    0.60  . Q       .        .             .       V  .
19.583    4.6588    0.59  . Q       .        .             .       V  .
19.667    4.6629    0.59  . Q       .        .             .       V  .
19.750    4.6670    0.59  . Q       .        .             .       V  .
19.833    4.6700    0.45  .Q        .        .             .       V  .
19.917    4.6731    0.45  .Q        .        .             .       V  .
20.000    4.6762    0.45  .Q        .        .             .       V  .
20.083    4.6794    0.46  .Q        .        .             .       V  .
20.167    4.6825    0.46  .Q        .        .             .       V  .
20.250    4.6857    0.46  .Q        .        .             .       V  .
20.333    4.6892    0.51  . Q       .        .             .       V  .
20.417    4.6927    0.51  . Q       .        .             .       V  .
20.500    4.6963    0.51  . Q       .        .             .       V  .
```

20.583	4.6999	0.52	. Q	.	.	.	V.
20.667	4.7035	0.52	. Q	.	.	.	V.
20.750	4.7071	0.52	. Q	.	.	.	V.
20.833	4.7101	0.44	.Q	.	.	.	V.
20.917	4.7131	0.44	.Q	.	.	.	V.
21.000	4.7161	0.44	.Q	.	.	.	V.
21.083	4.7192	0.45	.Q	.	.	.	V.
21.167	4.7223	0.45	.Q	.	.	.	V.
21.250	4.7254	0.45	.Q	.	.	.	V.
21.333	4.7284	0.42	.Q	.	.	.	V.
21.417	4.7313	0.42	.Q	.	.	.	V.
21.500	4.7342	0.42	.Q	.	.	.	V.
21.583	4.7373	0.45	.Q	.	.	.	V.
21.667	4.7404	0.45	.Q	.	.	.	V.
21.750	4.7435	0.45	.Q	.	.	.	V.
21.833	4.7464	0.42	.Q	.	.	.	V.
21.917	4.7494	0.42	.Q	.	.	.	V.
22.000	4.7523	0.42	.Q	.	.	.	V.
22.083	4.7554	0.45	.Q	.	.	.	V.
22.167	4.7585	0.45	.Q	.	.	.	V.
22.250	4.7616	0.45	.Q	.	.	.	V.
22.333	4.7645	0.42	.Q	.	.	.	V.
22.417	4.7674	0.42	.Q	.	.	.	V.
22.500	4.7704	0.42	.Q	.	.	.	V.
22.583	4.7729	0.36	.Q	.	.	.	V.
22.667	4.7753	0.36	.Q	.	.	.	V.
22.750	4.7778	0.36	.Q	.	.	.	V.
22.833	4.7803	0.35	.Q	.	.	.	V.
22.917	4.7827	0.35	.Q	.	.	.	V.
23.000	4.7851	0.35	.Q	.	.	.	V.
23.083	4.7876	0.35	.Q	.	.	.	V.
23.166	4.7900	0.35	.Q	.	.	.	V.
23.250	4.7924	0.35	.Q	.	.	.	V.
23.333	4.7948	0.35	.Q	.	.	.	V.
23.416	4.7972	0.35	.Q	.	.	.	V.
23.500	4.7996	0.35	.Q	.	.	.	V.
23.583	4.8020	0.35	.Q	.	.	.	V.
23.666	4.8044	0.35	.Q	.	.	.	V.
23.750	4.8069	0.35	.Q	.	.	.	V.
23.833	4.8093	0.35	.Q	.	.	.	V.
23.916	4.8117	0.35	.Q	.	.	.	V.
24.000	4.8141	0.35	.Q	.	.	.	V.
24.083	4.8153	0.17	Q	.	.	.	V.
24.166	4.8165	0.17	Q	.	.	.	V.
24.250	4.8176	0.17	Q	.	.	.	V.
24.333	4.8179	0.03	Q	.	.	.	V.
24.416	4.8181	0.03	Q	.	.	.	V.
24.500	4.8183	0.03	Q	.	.	.	V.
24.583	4.8183	0.01	Q	.	.	.	V.
24.666	4.8184	0.01	Q	.	.	.	V.
24.750	4.8185	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1485.0
10%	750.0
20%	525.0
30%	450.0

40%	390.0
50%	255.0
60%	195.0
70%	150.0
80%	60.0
90%	30.0

==========

END OF FLOODSCX ROUTING ANALYSIS

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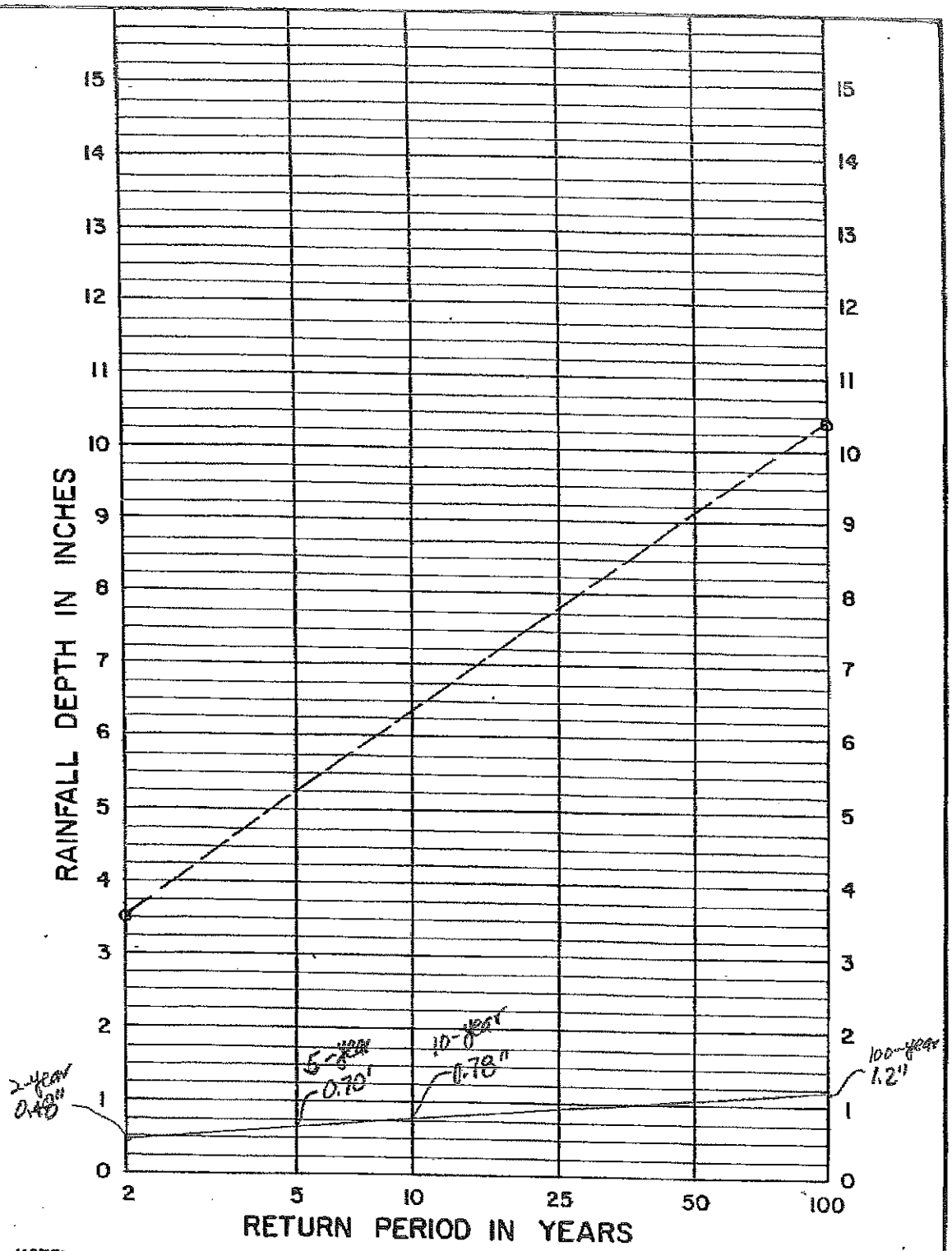
APPENDIX F

Rainfall Intensity Calculations

For 1 Hour



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

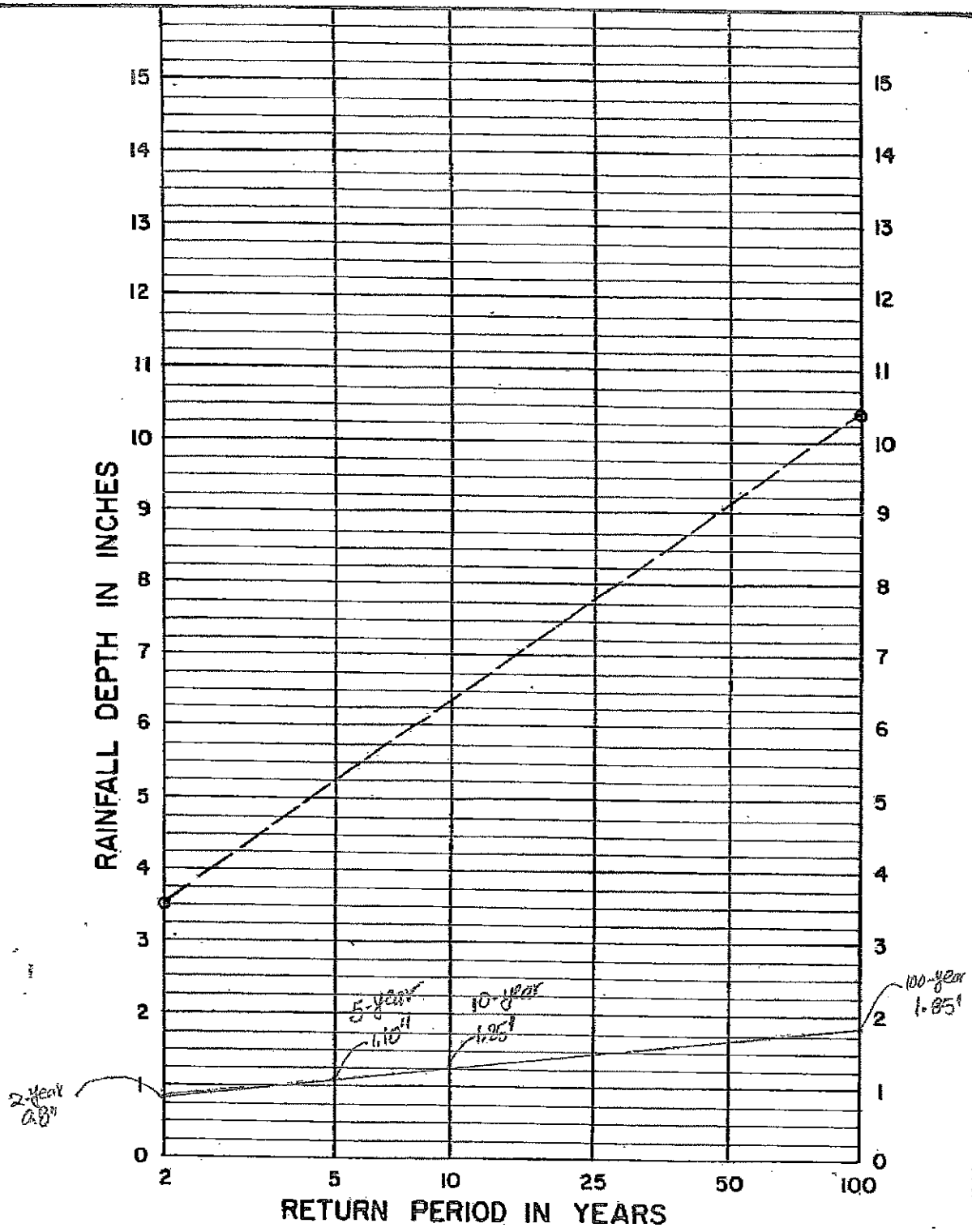
Reference: NOAA Atlas 2, Volume XI-California, 1973.

RCFC & WCD

HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

For 3 Hour.



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

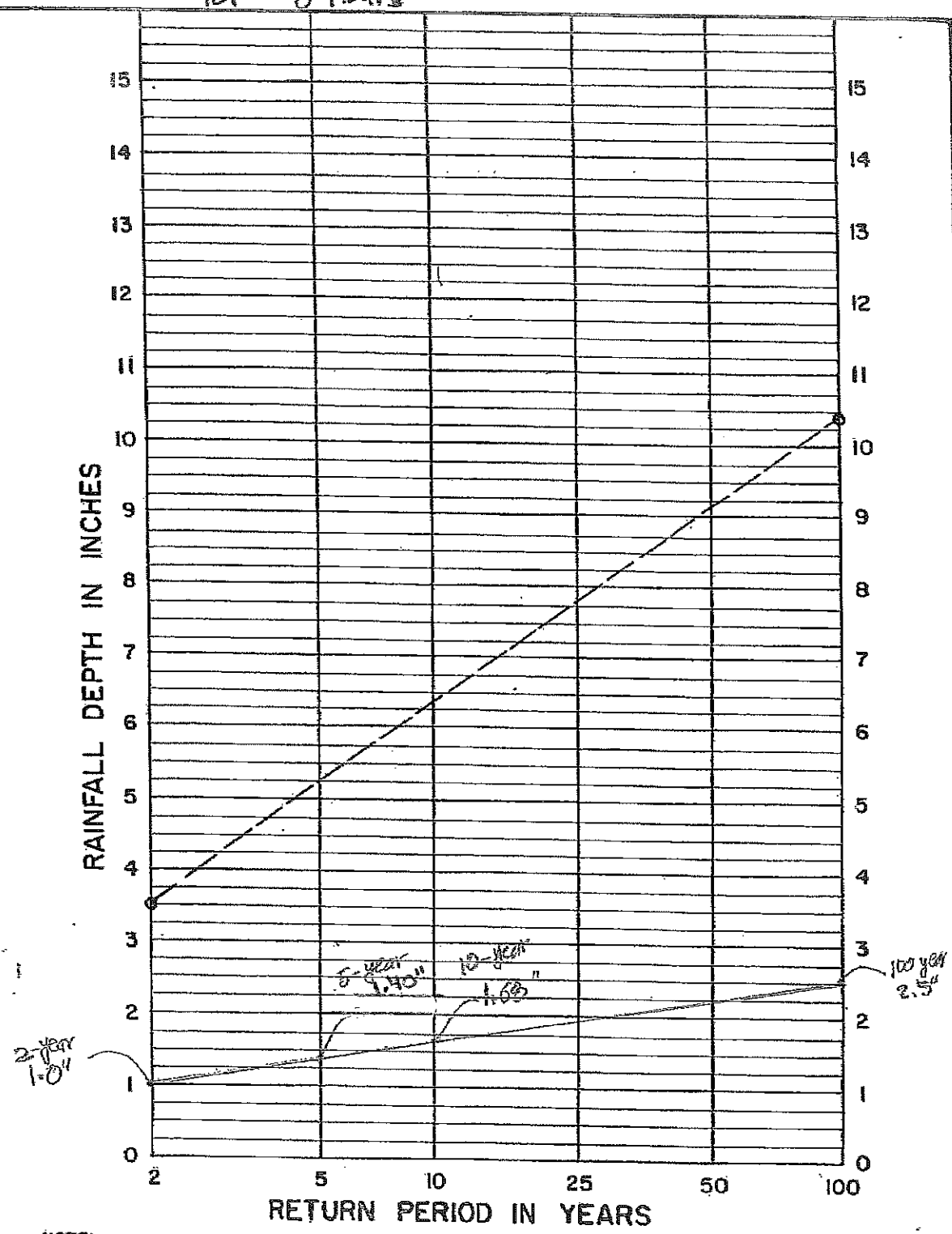
Reference: NOAA Atlas 2, Volume XI-California, 1973.

RCFC & WCD

HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

For 6 Hours



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

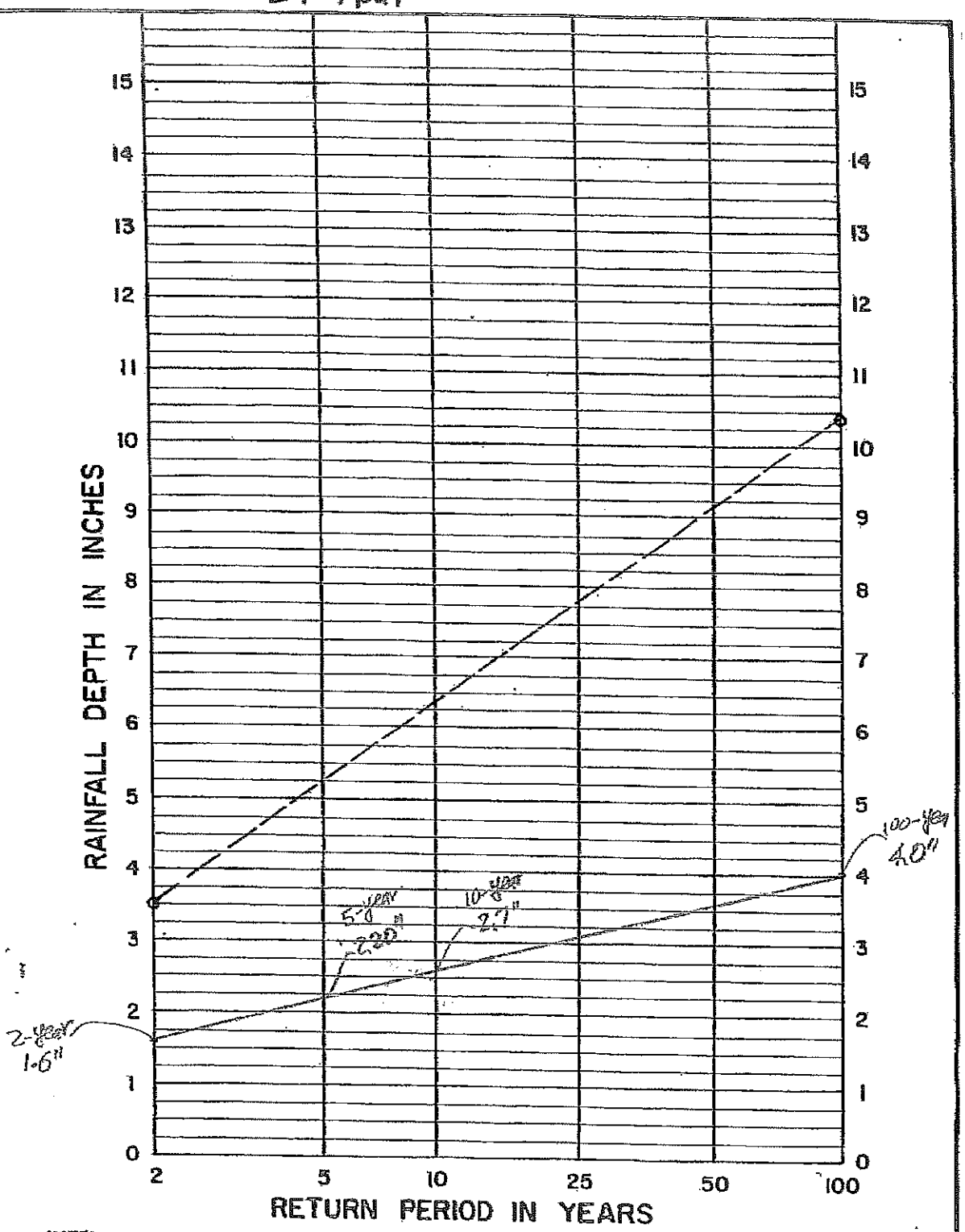
Reference: NOAA Atlas 2, Volume XI–California, 1973.

RCFC & WCD

HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

24-Hour



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA Atlas 2, Volume XI-California, 1973.

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HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

APPENDIX G

Loss Rate Data

RCFC & WCD HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

Basic Data Calculation Form

Project: Moreno Valley TTM

By: HTP Date: 5/26/08

Checked: ____ Date: ____

Sheet: ____

LOSS RATE DATA

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE-IN/HR (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-IN/HR [4](1-.9[6])	[8] AREA ~~SQ-INCHES~~ Acre	[9] [8]/Σ[8]	[10] AVERAGE ADJUSTED INFILTRATION RATE-IN/HR [7]•[9]
B	Pavement & Landscaping	56	0.51	Commercial	0.9	0.097	21.7	1	0.097
							Σ[8]= 21.7		Σ[10]= 0.097

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

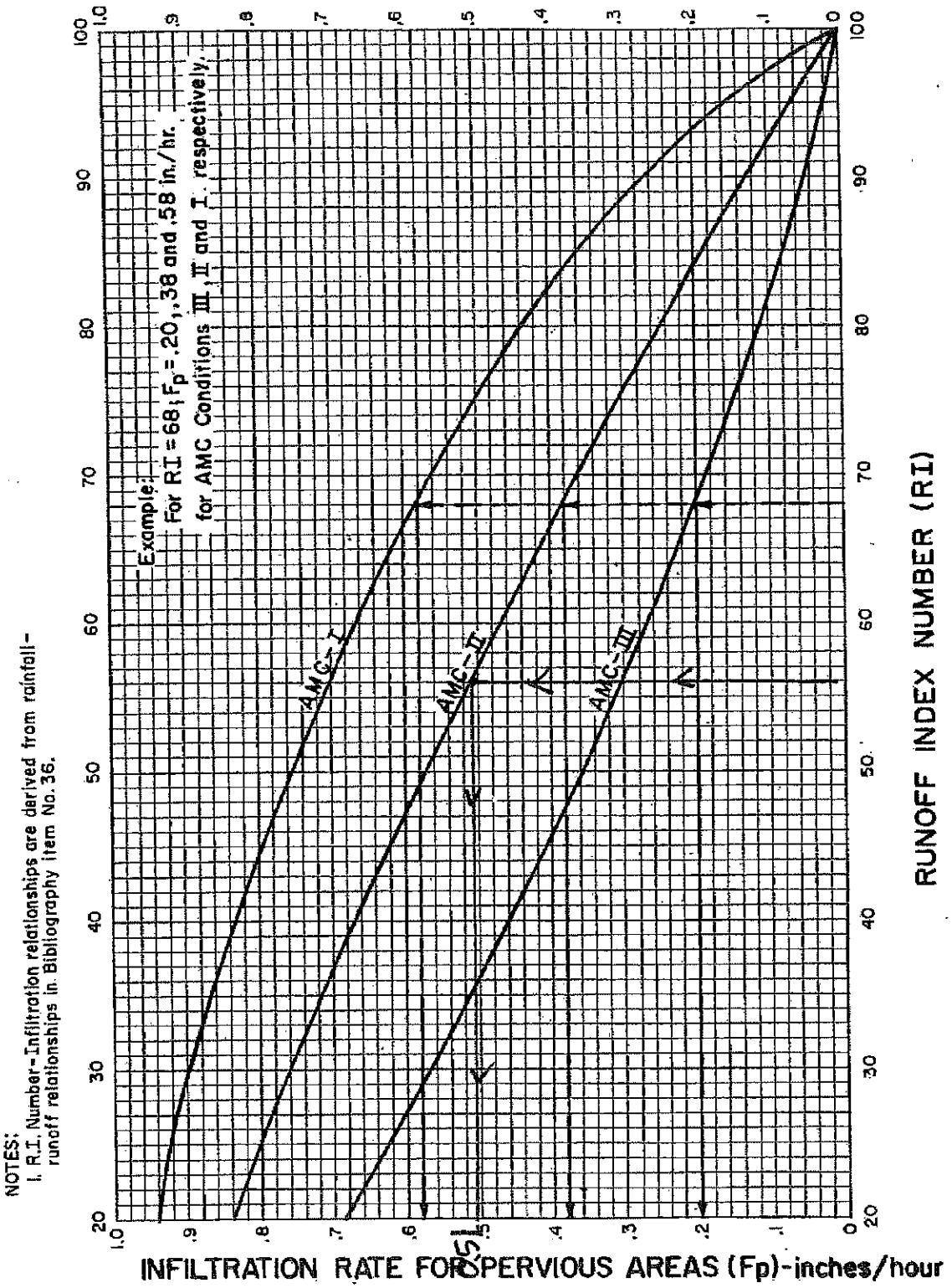
F_m = Minimum Loss Rate ≅ $F/2 = \Sigma[10]/2$ = ________ IN./HR.

$C = (F - F_m)/54 = (\Sigma[10] - F_m)/54$ = ________

$F_T = C(24-(T/60))^{1.55} + F_m$ = ________ $(24-(T/60))^{1.55}$ + ________ IN./HR.

Where:

T = Time in minutes. To get an average value for each unit time period, Use T = $\frac{1}{2}$ the unit time for the first time period, T = $1\frac{1}{2}$ unit time for the second period, etc.



NOTES:
1. R.I. Number-Infiltration relationships are derived from rainfall-runoff relationships in Bibliography item No. 36.

RCFC & WCD

HYDROLOGY MANUAL

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS RUNOFF INDEX NUMBERS

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APPENDIX H

Basin Capacity Calculations

BASIN STORAGE CALCULATION

ELEV LEVEL	AREA	VOLUME	ACCUMULATE VOL	ACCUMULATE VOL	
	ft^2	ft^3	ft^3	acre-ft	
1503.0	19,217				
1503.5	20,073	9,823	9,823	0.23	
1504.0	20,943	10,254	20,077	0.46	
1504.5	21,827	10,693	30,769	0.71	
1505.0	22,726	11,138	41,907	0.96	DEAD STORAGE
1505.5	23,638	11,591	53,498	1.23	
1506.0	24,565	12,051	65,549	1.50	
1506.5	25,506	12,518	78,067	1.79	
1507.0	26,461	12,992	91,059	2.09	
1507.5	27,430	13,473	104,531	2.40	
1508.0	28,413	13,961	118,492	2.72	
1508.5	29,410	14,456	132,948	3.05	
1509.0	**30,422**	**14,958**	**147,906**	**3.40**	
1509.5	31,448	15,468	163,373	3.75	Freeboard use
1510.0	32,487	15,984	179,357	4.12	Freeboard use

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and Associates, Inc.

APPENDIX I

Riser Design Calculations

Q=C*A*(2*g*H)^0.5

Q: the orifice flow discharge (cfs).
C: discharge coefficient, use 0.6
A: cross section area of orifice (sq. ft.)
g: 32.2 ft/sec^2
H: effect head on the orifice, from the center of orifice to water surface

Use 2-12" diameter opening at opposite side of 36" CMP riser.
Fist pair opening will be at 1505.0 (bottom of opening).

DIA. OF OPENING	TOTAL OPENING AREA	H	Q	CENTER OF OPENING ELEV.	WATER SURFACE ELEV.
(ft)	(ft^2)	(ft)	(cfs)		
1.00	1.57	0.00	0.00	1505.5	1505.5
1.00	1.57	0.50	5.35	1505.5	1506.0
1.00	1.57	1.00	7.56	1505.5	1506.5
1.00	1.57	1.50	9.26	1505.5	1507.0
1.00	1.57	2.00	10.69	1505.5	1507.5
1.00	1.57	2.50	11.95	1505.5	1508.0
1.00	1.57	3.00	13.09	1505.5	1508.5
1.00	1.57	3.50	14.14	1505.5	1509.0

Second pair opening will be at 1507.0 (bottom of opening).

DIA. OF OPENING	TOTAL OPENING AREA	H	Q	CENTER OF OPENING ELEV.	WATER SURFACE ELEV.
(ft)	(ft^2)	(ft)	(cfs)		
1.00	1.57			1507.5	1505.5
1.00	1.57			1507.5	1506.0
1.00	1.57			1507.5	1506.5
1.00	1.57			1507.5	1507.0
1.00	1.57	0.00	0.00	1507.5	1507.5
1.00	1.57	0.50	5.35	1507.5	1508.0
1.00	1.57	1.00	7.56	1507.5	1508.5
1.00	1.57	1.50	9.26	1507.5	1509.0

Basin water surface elevation verse discharge

WATER 5URFACE ELEV.	DISCHARGE Q
	(cfs)
1505.5	0.00
1506.0	5.35
1506.5	7.56
1507.0	9.26
1507.5	10.69
1508.0	17.30
1508.5	20.65
1509.0	23.40

INPUT FOR AES FLOOD ROUTING ANALYSIS

INTERVAL NUMBER	DEPTH	OUT FLOW	STORAGE
	(ft)	(cfs)	(acre-feet)
1		0.00	0.00
2	2.5	0.00	1.23
3	3.0	5.35	1.50
4	3.5	7.56	1.79
5	4.0	9.26	2.09
6	4.5	10.69	2.40
7	5.0	17.30	2.72
8	5.5	20.65	3.05
9	6.0	23.40	3.40

Kimley-Horn
and Associates, Inc.

APPENDIX J

Flood and Basin Routing Analysis

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                F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2011 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 18.0)
              Release Date: 05/01/2011  License ID 1499

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* 100 YEAR, 6 HOUR                                                      *
* FLOW THROUGH BASIN INCLUDED                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: FLODB.DAT
  TIME/DATE OF STUDY: 12:14 07/01/2013

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       21.700 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.097
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.50 INCHES
         RCFC&WCD 6-Hour Storm (5-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
       1                13.994                36.725
```

2	59.664	119.855
3	78.792	50.199
4	86.766	20.925
5	91.428	12.235
6	94.514	8.100
7	96.650	5.604
8	98.044	3.659
9	98.699	1.717
10	99.289	1.550
11	99.716	1.119
12	99.929	0.560
13	100.000	0.187

♀
****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0125	0.0063	0.0063
2	0.0150	0.0075	0.0075
3	0.0150	0.0075	0.0075
4	0.0150	0.0075	0.0075
5	0.0150	0.0075	0.0075
6	0.0175	0.0081	0.0094
7	0.0175	0.0081	0.0094
8	0.0175	0.0081	0.0094
9	0.0175	0.0081	0.0094
10	0.0175	0.0081	0.0094
11	0.0175	0.0081	0.0094
12	0.0200	0.0081	0.0119
13	0.0200	0.0081	0.0119
14	0.0200	0.0081	0.0119
15	0.0200	0.0081	0.0119
16	0.0200	0.0081	0.0119
17	0.0200	0.0081	0.0119
18	0.0200	0.0081	0.0119
19	0.0200	0.0081	0.0119
20	0.0200	0.0081	0.0119
21	0.0200	0.0081	0.0119
22	0.0200	0.0081	0.0119
23	0.0200	0.0081	0.0119
24	0.0225	0.0081	0.0144
25	0.0200	0.0081	0.0119
26	0.0225	0.0081	0.0144
27	0.0225	0.0081	0.0144
28	0.0225	0.0081	0.0144
29	0.0225	0.0081	0.0144
30	0.0225	0.0081	0.0144
31	0.0225	0.0081	0.0144
32	0.0225	0.0081	0.0144
33	0.0250	0.0081	0.0169
34	0.0250	0.0081	0.0169
35	0.0250	0.0081	0.0169
36	0.0250	0.0081	0.0169
37	0.0250	0.0081	0.0169
38	0.0275	0.0081	0.0194
39	0.0275	0.0081	0.0194
40	0.0275	0.0081	0.0194
41	0.0300	0.0081	0.0219
42	0.0325	0.0081	0.0244
43	0.0350	0.0081	0.0269

44	0.0350	0.0081	0.0269
45	0.0375	0.0081	0.0294
46	0.0375	0.0081	0.0294
47	0.0400	0.0081	0.0319
48	0.0400	0.0081	0.0319
49	0.0425	0.0081	0.0344
50	0.0450	0.0081	0.0369
51	0.0475	0.0081	0.0394
52	0.0500	0.0081	0.0419
53	0.0525	0.0081	0.0444
54	0.0525	0.0081	0.0444
55	0.0550	0.0081	0.0469
56	0.0575	0.0081	0.0494
57	0.0600	0.0081	0.0519
58	0.0600	0.0081	0.0519
59	0.0625	0.0081	0.0544
60	0.0650	0.0081	0.0569
61	0.0775	0.0081	0.0694
62	0.0900	0.0081	0.0819
63	0.0975	0.0081	0.0894
64	0.1050	0.0081	0.0969
65	0.1175	0.0081	0.1094
66	0.1400	0.0081	0.1319
67	0.0475	0.0081	0.0394
68	0.0225	0.0081	0.0144
69	0.0150	0.0075	0.0075
70	0.0125	0.0063	0.0063
71	0.0075	0.0038	0.0038
72	0.0050	0.0025	0.0025

TOTAL STORM RAINFALL(INCHES) = 2.50
TOTAL SOIL-LOSS(INCHES) = 0.57
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.93

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.0226
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.4964

♀

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6 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	7.5	15.0	22.5	30.0
0.083	0.0016	0.23	Q	.	.	.	.
0.167	0.0086	1.02	VQ	.	.	.	.
0.250	0.0189	1.49	VQ	.	.	.	.
0.333	0.0305	1.68	V Q	.	.	.	.
0.417	0.0428	1.78	V Q	.	.	.	.
0.500	0.0560	1.92	V Q	.	.	.	.
0.583	0.0711	2.20	V Q	.	.	.	.
0.667	0.0871	2.32	V Q	.	.	.	.
0.750	0.1035	2.38	.V Q	.	.	.	.
0.833	0.1201	2.41	.V Q	.	.	.	.
0.917	0.1369	2.44	.V Q	.	.	.	.
1.000	0.1544	2.54	.V Q	.	.	.	.
1.083	0.1740	2.85	.V Q	.	.	.	.

1.167	0.1946	2.98	. VQ . . . .
1.250	0.2155	3.04	. V Q . . . .
1.333	0.2366	3.07	. V Q . . . .
1.417	0.2579	3.09	. V Q . . . .
1.500	0.2793	3.11	. VQ . . . .
1.583	0.3007	3.11	. VQ . . . .
1.667	0.3222	3.12	. VQ . . . .
1.750	0.3437	3.12	. VQ . . . .
1.833	0.3652	3.13	. Q . . . .
1.917	0.3868	3.13	. Q . . . .
2.000	0.4090	3.22	. Q . . . .
2.083	0.4326	3.43	. Q . . . .
2.167	0.4556	3.34	. QV . . . .
2.250	0.4802	3.57	. QV . . . .
2.333	0.5055	3.67	. QV . . . .
2.417	0.5311	3.72	. Q V . . . .
2.500	0.5569	3.74	. Q V . . . .
2.583	0.5827	3.76	. QV . . . .
2.667	0.6087	3.77	. QV . . . .
2.750	0.6353	3.87	. Q V . . . .
2.833	0.6640	4.17	. Q V . . . .
2.917	0.6936	4.30	. Q V . . . .
3.000	0.7236	4.35	. Q V . . . .
3.083	0.7538	4.38	. Q V . . . .
3.167	0.7847	4.50	. Q V . . . .
3.250	0.8178	4.81	. Q V. . . . .
3.333	0.8519	4.94	. Q V. . . . .
3.417	0.8869	5.09	. Q V . . . .
3.500	0.9250	5.52	. Q V . . . .
3.583	0.9667	6.06	. Q .V . . . .
3.667	1.0118	6.55	. Q .V . . . .
3.750	1.0590	6.86	. Q. V . . . .
3.833	1.1091	7.27	. Q. V . . . .
3.917	1.1611	7.55	. Q V . . . .
4.000	1.2159	7.95	. Q V . . . .
4.083	1.2725	8.23	. Q V . . . .
4.167	1.3325	8.71	. .Q V . . . .
4.250	1.3965	9.28	. . Q V . . . .
4.333	1.4646	9.89	. . Q V . . . .
4.417	1.5370	10.51	. . Q V . . . .
4.500	1.6131	11.06	. . Q V . . . .
4.583	1.6916	11.40	. . Q V. . . . .
4.667	1.7737	11.92	. . Q V . . . .
4.750	1.8599	12.52	. . Q .V . . . .
4.833	1.9498	13.05	. . Q . V . . . .
4.917	2.0420	13.38	. . Q . V . . . .
5.000	2.1377	13.90	. . Q . V . . . .
5.083	2.2401	14.86	. . Q. V . . . .
5.167	2.3575	17.05	. . . Q V . . . .
5.250	2.4923	19.57	. . . Q V . . . .
5.333	2.6417	21.70	. . . Q V . . . .
5.417	2.8063	23.89	. . . .QV . . . .
5.500	2.9925	27.04	. . . . V Q . . . .
5.583	3.1812	27.40	. . . . Q . . . .
5.667	3.2987	17.07	. . . Q . . . V . .
5.750	3.3674	9.97	. . Q . . . V . .
5.833	3.4115	6.40	. Q . . . . V. .
5.917	3.4424	4.48	. Q . . . . V. .
6.000	3.4637	3.09	. Q . . . . V. .
6.083	3.4776	2.03	. Q . . . . V. .
6.167	3.4855	1.14	.Q . . . . V. .
6.250	3.4903	0.71	Q . . . . V. .
6.333	3.4933	0.44	Q . . . . V. .

```
6.417      3.4950      0.24  Q          .          .          .          V.
6.500      3.4958      0.11  Q          .          .          .          V.
6.583      3.4961      0.05  Q          .          .          .          V.
6.667      3.4963      0.02  Q          .          .          .          V.
6.750      3.4964      0.01  Q          .          .          .          V.
6.833      3.4964      0.01  Q          .          .          .          V.
----------------------------------------------------------------------------
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	410.0
10%	300.0
20%	145.0
30%	105.0
40%	75.0
50%	45.0
60%	35.0
70%	25.0
80%	15.0
90%	10.0

```
****************************************************************************
  FLOW PROCESS FROM NODE     101.00 TO NODE     101.00 IS CODE = 3.1
----------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
============================================================================
```

```
      INFLOW
    (STREAM 1)
        |
        |
        V                    __effective depth
  -----------                |   (and volume)
 |           |   |           |
 |           |   |  ....V........
 | detention |<-->|            outflow
 |   basin   |   |.........._______
  -----------                |     \
        |                    |  dead   |   basin outlet
        V                    | storage |
     OUTFLOW                  ---------
    (STREAM 1)
```

```
ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
  DEAD STORAGE(AF) =       0.850
  SPECIFIED DEAD STORAGE(AF) FILLED =       0.850
  SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET =       0.000
  DETENTION BASIN CONSTANT LOSS RATE(CFS) =     0.00
```

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)

1	0.00	0.00	0.000
2	2.50	0.01	1.230
3	3.00	5.35	1.500
4	3.50	7.56	1.790
5	4.00	9.26	2.090
6	4.50	10.69	2.400
7	5.00	17.30	2.720
8	5.50	20.65	3.050
9	6.00	23.40	3.400

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.083	0.850	0.23	0.00	0.00	0.0	0.002
0.167	0.850	1.02	0.00	0.02	0.0	0.009
0.250	0.850	1.49	0.00	0.04	0.0	0.019
0.333	0.850	1.68	0.00	0.06	0.0	0.030
0.417	0.850	1.78	0.00	0.09	0.0	0.043
0.500	0.850	1.92	0.00	0.11	0.0	0.056
0.583	0.850	2.20	0.00	0.14	0.0	0.071
0.667	0.850	2.32	0.00	0.18	0.0	0.087
0.750	0.850	2.38	0.00	0.21	0.0	0.103
0.833	0.850	2.41	0.00	0.24	0.0	0.120
0.917	0.850	2.44	0.00	0.28	0.0	0.137
1.000	0.850	2.54	0.00	0.31	0.0	0.154
1.083	0.850	2.85	0.00	0.35	0.0	0.174
1.167	0.850	2.98	0.00	0.40	0.0	0.194
1.250	0.850	3.04	0.00	0.44	0.0	0.215
1.333	0.850	3.07	0.00	0.48	0.0	0.237
1.417	0.850	3.09	0.00	0.52	0.0	0.258
1.500	0.850	3.11	0.00	0.57	0.0	0.279
1.583	0.850	3.11	0.00	0.61	0.0	0.301
1.667	0.850	3.12	0.00	0.65	0.0	0.322
1.750	0.850	3.12	0.00	0.70	0.0	0.344
1.833	0.850	3.13	0.00	0.74	0.0	0.365
1.917	0.850	3.13	0.00	0.79	0.0	0.387
2.000	0.850	3.22	0.00	0.83	0.0	0.409
2.083	0.850	3.43	0.00	0.88	0.0	0.432
2.167	0.850	3.34	0.00	0.93	0.0	0.455
2.250	0.850	3.57	0.00	0.98	0.0	0.480
2.333	0.850	3.67	0.00	1.03	0.0	0.505
2.417	0.850	3.72	0.00	1.08	0.0	0.531
2.500	0.850	3.74	0.00	1.13	0.0	0.556
2.583	0.850	3.76	0.00	1.18	0.0	0.582
2.667	0.850	3.77	0.00	1.24	0.0	0.608
2.750	0.850	3.87	0.00	1.29	0.0	0.635
2.833	0.850	4.17	0.00	1.35	0.0	0.663
2.917	0.850	4.30	0.00	1.41	0.0	0.693
3.000	0.850	4.35	0.00	1.47	0.0	0.723
3.083	0.850	4.38	0.00	1.53	0.0	0.753
3.167	0.850	4.50	0.00	1.59	0.0	0.784
3.250	0.850	4.81	0.00	1.66	0.0	0.817
3.333	0.850	4.94	0.00	1.73	0.0	0.851
3.417	0.850	5.09	0.00	1.80	0.0	0.886
3.500	0.850	5.52	0.00	1.88	0.0	0.924
3.583	0.850	6.06	0.00	1.96	0.0	0.966

3.667	0.850	6.55	0.00	2.05	0.0	1.011
3.750	0.850	6.86	0.00	2.15	0.0	1.058
3.833	0.850	7.27	0.00	2.25	0.0	1.108
3.917	0.850	7.55	0.00	2.36	0.0	1.160
4.000	0.850	7.95	0.00	2.47	0.0	1.215
4.083	0.850	8.23	0.00	2.57	0.4	1.268
4.167	0.850	8.71	0.00	2.67	1.3	1.320
4.250	0.850	9.28	0.00	2.76	2.3	1.368
4.333	0.850	9.89	0.00	2.84	3.2	1.414
4.417	0.850	10.51	0.00	2.92	4.1	1.458
4.500	0.850	11.06	0.00	3.00	4.9	1.500
4.583	0.850	11.40	0.00	3.07	5.5	1.541
4.667	0.850	11.92	0.00	3.14	5.8	1.583
4.750	0.850	12.52	0.00	3.22	6.1	1.627
4.833	0.850	13.05	0.00	3.30	6.5	1.672
4.917	0.850	13.38	0.00	3.37	6.8	1.717
5.000	0.850	13.90	0.00	3.45	7.2	1.763
5.083	0.850	14.86	0.00	3.54	7.5	1.814
5.167	0.850	17.05	0.00	3.65	7.9	1.877
5.250	0.850	19.57	0.00	3.77	8.3	1.955
5.333	0.850	21.70	0.00	3.92	8.7	2.044
5.417	0.850	23.89	0.00	4.09	9.3	2.145
5.500	0.850	27.04	0.00	4.28	9.8	2.264
5.583	0.850	27.40	0.00	4.47	10.3	2.381
5.667	0.850	17.07	0.00	4.54	10.9	2.424
5.750	0.850	9.97	0.00	4.53	11.1	2.416
5.833	0.850	6.40	0.00	4.48	10.8	2.386
5.917	0.850	4.48	0.00	4.41	10.5	2.344
6.000	0.850	3.09	0.00	4.33	10.3	2.294
6.083	0.850	2.03	0.00	4.24	10.1	2.239
6.167	0.850	1.14	0.00	4.14	9.8	2.179
6.250	0.850	0.71	0.00	4.05	9.5	2.118
6.333	0.850	0.44	0.00	3.95	9.2	2.058
6.417	0.850	0.24	0.00	3.85	8.9	1.998
6.500	0.850	0.11	0.00	3.75	8.6	1.940
6.583	0.850	0.05	0.00	3.66	8.2	1.883
6.667	0.850	0.02	0.00	3.56	7.9	1.829
6.750	0.850	0.01	0.00	3.48	7.6	1.776
6.833	0.850	0.01	0.00	3.39	7.3	1.726
6.917	0.850	0.00	0.00	3.31	6.9	1.679

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 3.496 AF
BASIN STORAGE = 1.516 AF (WITH 0.850 AF INITIALLY FILLED)
OUTFLOW VOLUME = 2.830 AF
LOSS VOLUME = 0.000 AF

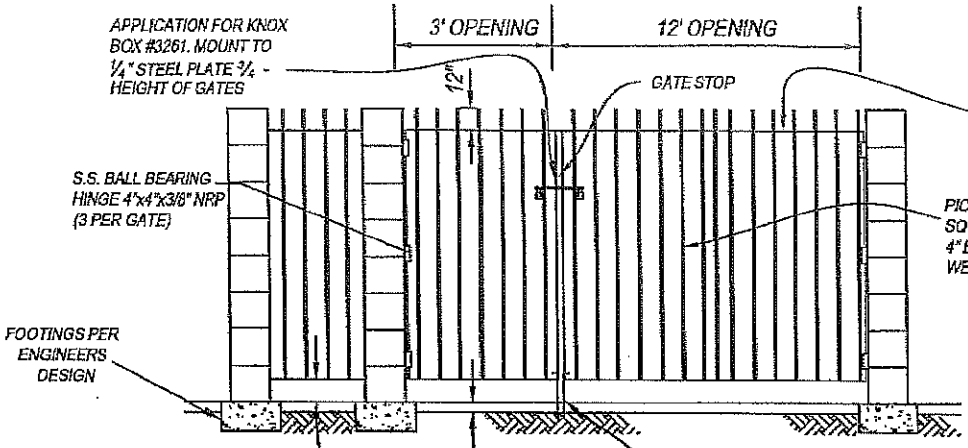
==========

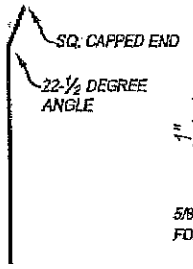
END OF FLOODSCX ROUTING ANALYSIS

Kimley-Horn
and Associates, Inc.

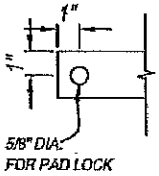
APPENDIX K

Detention Basin Fence and Gate Detail

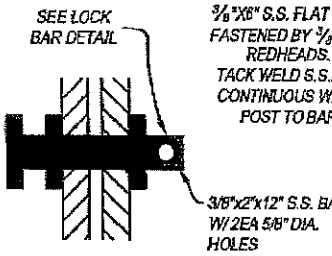




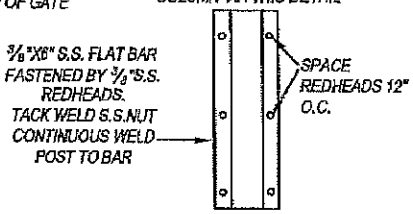
PICKET ANGLE DETAIL



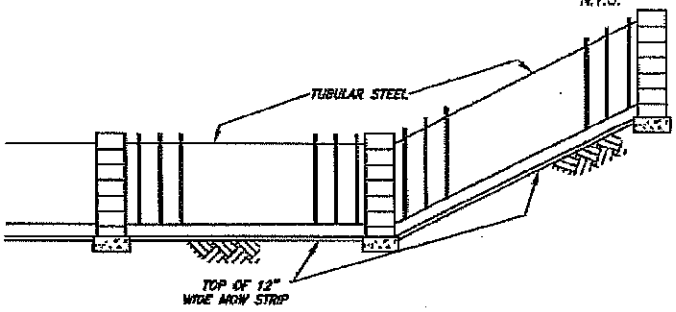
LOCK BAR
N.T.S.



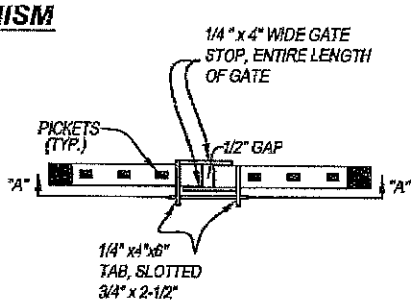
SECTION"A-A" LOCKING MECHANISM
N.T.S.



GATE POST EMBEDED DETAIL
N.T.S.



ALTERNATE PLAN VIEW
N.T.S.



TOP VIEW OF GATE
N.T.S.

HINGE DETAIL
N.T.S.

NOTES:

1.) ALL METAL IS TO BE STEEL AS INDICATED AND HOT DIPPED GALVANIZED.

2.) FINISH SHALL BE VITROCEM FOR METAL. COLOR PER SPECIFICATION.

3.) MOW STRIPE SHALL BE A MINIMUM 6" WIDE BY 6" THICK WITH ONE #4 REBAR.

LAND DEVELOPMENT	DATE 5/07	CITY OF MORENO VALLEY PREPARED BY CAPITAL PROJECTS
APPROVED BY PUBLIC WORKS DIRECTOR/ CITY ENGINEER	DIVISION MANAGER INITIAL	**MODIFIED EXTENED DETENTION BASIN FENCE AND GATE DETAIL GUIDE**
		1 of 1 NO. 637