

Revised
Hydrology and Hydraulic Study

For
TPM-17341 & 19618
APN 267-146-05, 08
APN 267-145-09~12
San Diego, California 92127
and per
L15684, PDS2014-LDPCHG-00072

Prepared For:

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TABLE OF CONTENTS

Section

INTRODUCTION	1
DESIGN CRITERIA AND ASSUMPTIONS	1
DISCUSSION	2
Existing Conditions.....	2
Proposed Conditions	3
CONCLUSION.....	5
DECLARATION OF RESPONSIBLE CHARGE	5
REFERENCES	6

ATTACHMENTS

ATTACHMENT 1 – LOCATION MAP

ATTACHMENT 2 – PRECIPITATION MAPS AND SOIL MAP

ATTACHMENT 3 – EXISTING HYDROLOGY CALCULATIONS

ATTACHMENT 4 – PROPOSED HYDROLOGY CALCULATIONS

ATTACHMENT 5 – HYDROLOGY MAP – EXISTING CONDITIONS

ATTACHMENT 6 – HYDROLOGY MAP – PROPOSED CONDITIONS

INTRODUCTION

Determine storm water runoff and site drainage for a 100 year storm event for a proposed residential unit in the County of San Diego, California. The project sites contains six parcels. Four parcels are located on a private road 670 feet west of Rio Vista Road, and two parcels are located on Rio Vista Road. The total project area is approximately 15.6 acres. The property currently is undeveloped.

The proposed site development consists of preparing the site for construction of a new pad, septic lines, and a paved private road. Incidental underground storm drain utilities, retaining walls, hardscape, and site landscaping are also proposed with this development. The project site is primarily an undisturbed land adjacent to two residential units south of Artesian Road with site elevations range from 430 to 328 feet above mean sea level (msl), and four residential units north of Artesian Road with site elevations range from 466 to 348 feet msl. See attachment 1 for the Site Location and Vicinity Maps.

DESIGN CRITERIA AND ASSUMPTIONS

1. The site soil classification as hydrologic soil type D. See Attachment 2.
2. Per the San Diego County Hydrology Manual (2003) Rainfall Isopluvial Map (See Attachment 2):
 - 100 Year Rainfall Event – 6 hours $P_6 = 2.8$ inches/hour
 - 100 Year Rainfall Event – 24 hours $P_{24} = 4.7$ inches/hour
3. Per the San Diego County Hydrology Manual (2003) Table 3.1:
4. Hydrologic calculations were performed using the CIVILCAD/CIVILDESIGN Engineering software version 7.6 per methods as outlined within the San Diego Hydrology Manual (2003). The hydrology calculations for proposed and existing conditions may be found within the hydrology calculations section of this report.

DISCUSSION

EXISTING CONDITIONS

The project sites are undeveloped, consisting of undisturbed natural areas and no existing structures. The surrounding areas are predominantly developed as single family residences. The project sites are separated by a public road, isolating four attached parcels to the north and two detached parcels to the south.

South of Artesian Road

Parcel 4 contain a low point at the northern property line, which accepts storm runoffs from the west, south, and east adjacent properties. Elevation ranges from 414.0 feet above mean sea level (msl) to 328 feet msl. Parcel 1 has offsite runoffs that sheet flow from south to north. Parcel 1 has elevation ranges from 430.0 feet msl to 388.0 feet msl.

North of Artesian Road

A large portion of offsite runoffs flows through Parcel 3 and 4, in addition to road runoffs to the west, and runoffs piped from the opposite side of the road. The stormwater enters a low point located in Parcel 4, then piped and discharge at the northern property line. Elevation ranges from 466.0 feet msl to 363.5 feet msl. Offsite runoffs, similar to Parcel 3 and 4, enter Parcel 1 and 2 via sheet flows to the northwest, where it will be captured by brow ditches and carried offsite.

Below is a summary of pre-development criteria for the subject property:

TABLE 1: 100 YEAR PRE-DEVELOPMENT CRITERIA-SOUTH				
Node	C	Tc (Min.)	Area (acre)	Q100 (cfs)
102	0.35	14.56	8.580	11.118
203	0.35	10.85	18.770	29.398

TABLE 1: 100 YEAR PRE-DEVELOPMENT CRITERIA-NORTH				
Node	C	Tc (Min.)	Area (acre)	Q100 (cfs)
102	0.35	13.17	23.790	32.888
202	0.35	10.73	9.030	14.247

PROPOSED CONDITIONS

The proposed conditions will consist of 4 basins, see Attachment 6 for proposed drainage patterns. Two basins located south of Artesian Road will maintain the existing hydrology flow paths. Brow ditches will be used in Parcel 1 to provide a control flow path, in between the two proposed buildings pads, toward the discharge point located northwest of the property. Two basins north of Artesian Road, containing the other four parcels, will also maintain flow path similar to the existing conditions. Brow ditches will be employed at the eastern portion along the property line of all four parcels to intercept offsite runoffs from entering building pads. The offsite runoffs will be routed around the building pads to a low point similar to the existing conditions as to not divert proposed drainage flows from the existing drainage flows. The project include construction of bioretention basins to treat and discharge stormwater at a control rate. Additionally, rip rap energy dissipators will be used to disperse stormwater concentrated peak flows, and for protection of downstream channels from erosion.

The proposed hydrologic conditions are summarized below:

TABLE 2: 100 YEAR POST-DEVELOPMENT CRITERIA WITHOUT DETENTION-SOUTH				
Node	C	Tc (Min.)	Area (acre)	Q100 (cfs)
102	0.52	13.68	8.580	11.937
203	0.49	11.10	16.686	26.049
302	0.35	6.33	1.734	3.182

TABLE 2: 100 YEAR POST-DEVELOPMENT CRITERIA WITHOUT DETENTION-NORTH				
Node	C	Tc (Min.)	Area (acre)	Q100 (cfs)
405	0.87	14.69	23.920	32.740
108	0.46	12.10	8.870	16.401

The proposed project will have hydrologic peak flows increased by 2.006 cfs at the low point located north west of Parcel 1, and 0.652 cfs in Parcel 1 on the south side of Artesian Road.

The proposed hydrologic conditions are summarized below:

TABLE 2: 100 YEAR POST-DEVELOPMENT CRITERIA WITH DETENTION-SOUTH				
Node	C	Tc (Min.)	Area (acre)	Q100 (cfs)
102	0.52	13.68	8.580	11.102
204	0.49	11.10	18.42	27.778

TABLE 2: 100 YEAR POST-DEVELOPMENT CRITERIA WITH DETENTION-NORTH				
Node	C	Tc (Min.)	Area (acre)	Q100 (cfs)
405	0.87	14.69	23.928	31.575
108	0.46	12.11	8.870	10.498

The proposed project with detention basins will reduce hydrologic peak flows located north west of Parcel 1 by 5.062 cfs and provide riprap to disperse concentrated flows, and 1.636 cfs in Parcel 1 on the south side of Artesian Road.

CONCLUSION

A hydrologic analysis has been conducted for the subject for a 100 year storm event. The site will employ the use of bioretention basins to treat and discharge stormwater at a control rate.

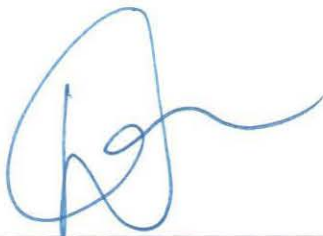
DECLARATION OF RESPONSIBLE CHARGE

I, hereby declare that I am the Engineer of Work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as Engineer of Work of my responsibility for project design.

ENGINEER OF WORK:

Civil Landworks Corporation
110 Copperwood Way Suite P,
Oceanside CA, USA 92058



David V. Caron
R.C.E. 70066
Exp. 9-30-18



10-13-17
Date

REFERENCES

1. San Diego County Hydrology Manual (June 2003).
2. San Diego County Drainage Design Manual (July 2005).
3. Web Soil Survey, San Diego Area, California. United States Natural Resource Conservation Service.
4. CIVILCADD/CIVILDESIGN Engineering Software, © 1991-2006 Version 7.6. San Diego County Control Division 2003 Manual Rational Hydrology Study.

ATTACHMENT 1

LOCATION MAP



SITE LOCATION MAP

DATE: 2-11-15

SCALE: **AS SHOWN**

NILSEN ARTESIAN

DRAWN BY: P. NONG

ATTACHMENT 2

PRECIPITATION MAPS AND SOIL MAP

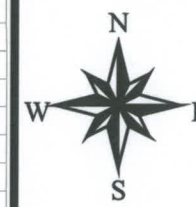
County of San Diego Hydrology Manual



Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

----- Isopluvial (inches)

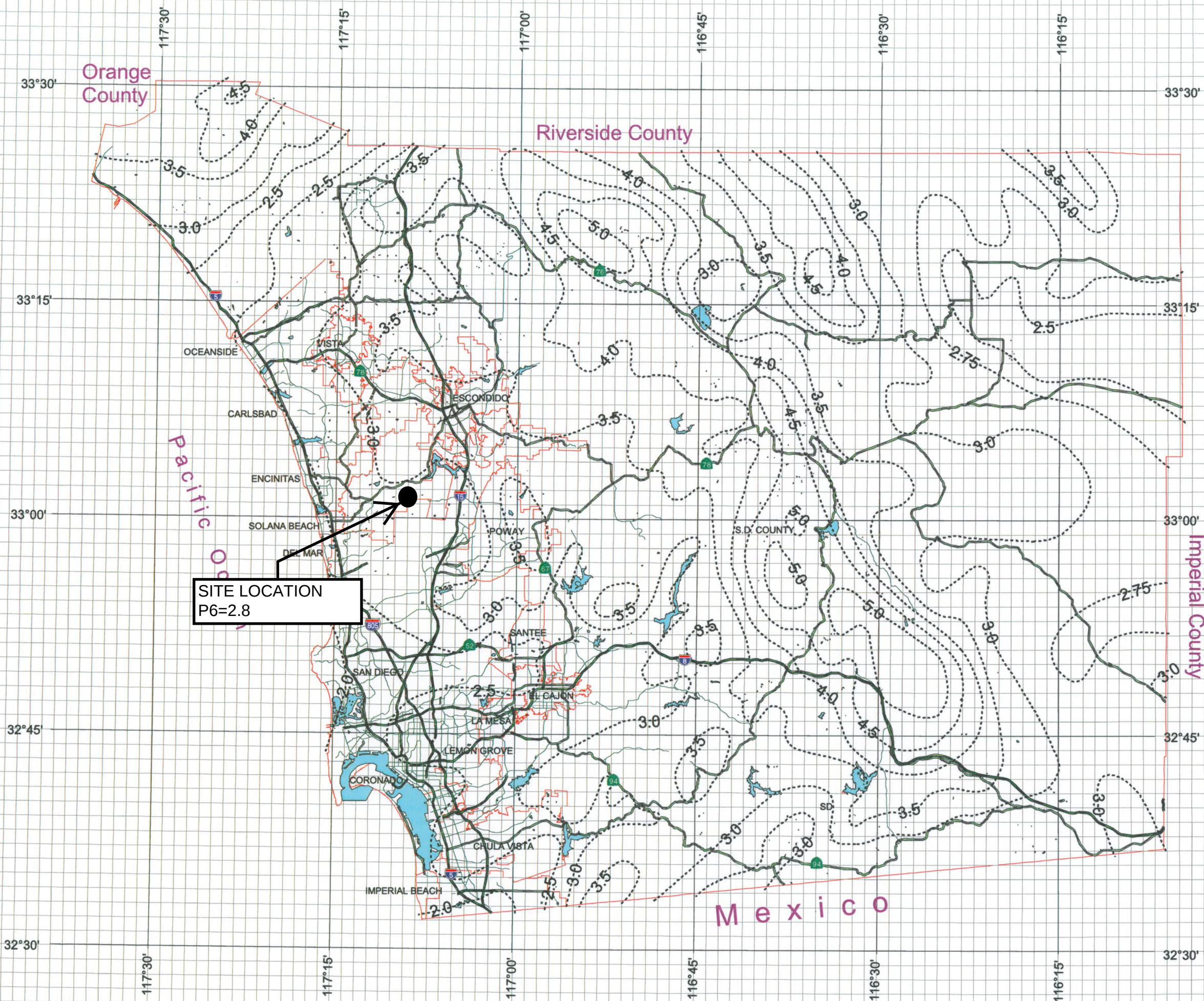


3 0 3 Miles

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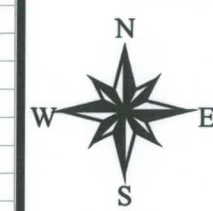


County of San Diego Hydrology Manual



Rainfall Isophuvials

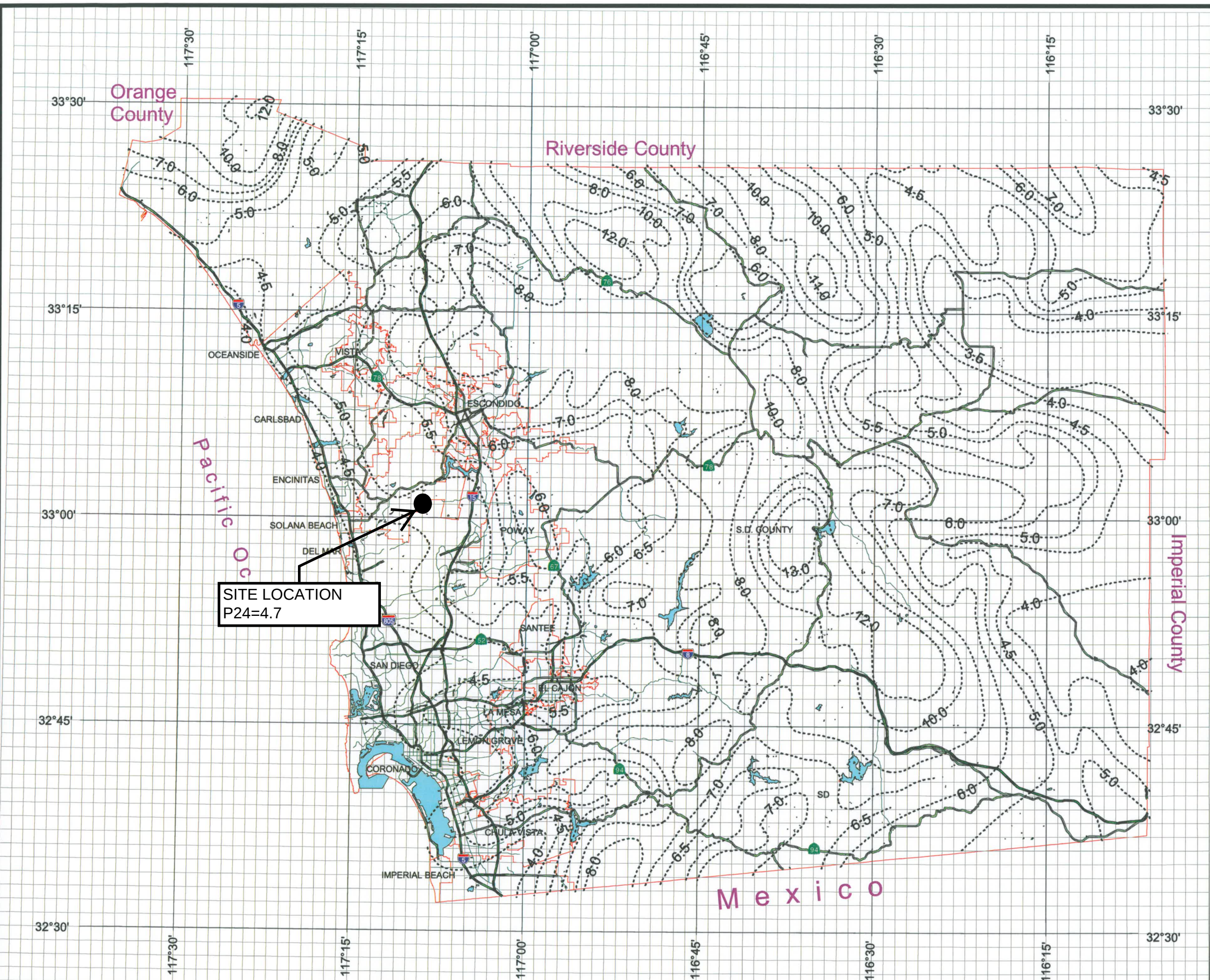
100 Year Rainfall Event - 24 Hours



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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

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

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 8, Sep 17, 2014

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

Date(s) aerial images were photographed: May 3, 2010—Jun 19, 2010

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

San Diego County Area, California (CA638)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HrC	Huerhuero loam, 2 to 9 percent slopes	35.7	76.1%
HrD	Huerhuero loam, 9 to 15 percent slopes	2.5	5.3%
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes	8.6	18.4%
SnG	San Miguel-Exchequer rocky silt loams, 9 to 70 percent slopes	0.1	0.2%
Totals for Area of Interest		46.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic

classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

HrC—Huerhuero loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbcm

Elevation: 1,100 feet

Mean annual precipitation: 12 to 20 inches

Mean annual air temperature: 57 degrees F

Frost-free period: 260 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Huerhuero and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huerhuero

Setting

Landform: Marine terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 12 inches: loam

H2 - 12 to 55 inches: clay loam, clay

H2 - 12 to 55 inches: stratified sand to sandy loam

H3 - 55 to 72 inches:

Properties and qualities

Slope: 2 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Claypan (1975) (R019XD061CA)

Minor Components

Las flores

Percent of map unit: 5 percent

Stockpen

Percent of map unit: 5 percent

Olivenhain

Percent of map unit: 3 percent

Unnamed, ponded

Percent of map unit: 2 percent

Landform: Depressions

HrD—Huerhuero loam, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbcp

Elevation: 1,100 feet

Mean annual precipitation: 12 to 20 inches

Mean annual air temperature: 57 degrees F

Frost-free period: 260 days

Farmland classification: Not prime farmland

Map Unit Composition

Huerhuero and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huerhuero

Setting

Landform: Marine terraces

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Calcareous alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 12 inches: loam

H2 - 12 to 55 inches: clay loam, clay

H2 - 12 to 55 inches: stratified sand to sandy loam

H3 - 55 to 72 inches:

Properties and qualities

Slope: 9 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Custom Soil Resource Report

Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Claypan (1975) (R019XD061CA)

Minor Components

Las flores

Percent of map unit: 10 percent

Oliventain

Percent of map unit: 3 percent

Unnamed

Percent of map unit: 2 percent

OhE—Olivenhain cobbly loam, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbfc

Elevation: 100 to 600 feet

Mean annual precipitation: 14 inches

Mean annual air temperature: 63 degrees F

Frost-free period: 290 to 330 days

Farmland classification: Not prime farmland

Map Unit Composition

Olivenhain and similar soils: 85 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Olivenhain

Setting

Landform: Marine terraces

Landform position (three-dimensional): Riser

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Gravelly alluvium derived from mixed sources

Typical profile

H1 - 0 to 10 inches: cobbly loam

H2 - 10 to 27 inches: very cobbly clay, very cobbly clay loam

H2 - 10 to 27 inches: cobbly loam, cobbly clay loam

H3 - 27 to 45 inches:

H3 - 27 to 45 inches:

Properties and qualities

Slope: 9 to 30 percent

Custom Soil Resource Report

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Claypan (1975) (R019XD061CA)

Minor Components

Diablo

Percent of map unit: 4 percent

Huerhuero

Percent of map unit: 2 percent

Linne

Percent of map unit: 2 percent

Unnamed, ponded

Percent of map unit: 2 percent

Landform: Depressions

SnG—San Miguel-Exchequer rocky silt loams, 9 to 70 percent slopes

Map Unit Setting

National map unit symbol: hbg1

Elevation: 400 to 3,300 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 to 64 degrees F

Frost-free period: 220 to 280 days

Farmland classification: Not prime farmland

Map Unit Composition

San miguel and similar soils: 45 percent

Exchequer and similar soils: 35 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Miguel

Setting

Landform: Mountain slopes

Landform position (two-dimensional): Backslope

Custom Soil Resource Report

Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Residuum weathered from metavolcanics

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 18 inches: clay loam, silty clay loam, clay
H2 - 8 to 18 inches: gravelly clay loam, gravelly silty clay loam, gravelly clay
H2 - 8 to 18 inches: unweathered bedrock
H3 - 18 to 23 inches:
H3 - 18 to 23 inches:
H3 - 18 to 23 inches:
H4 - 23 to 27 inches:

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 20 to 34 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Sodium adsorption ratio, maximum in profile: 15.0
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Acid claypan (claypan mesas - 1975) (R019XD062CA)

Description of Exchequer

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Metabasic residuum weathered from igneous and metamorphic rock

Typical profile

H1 - 0 to 10 inches: gravelly silt loam
H2 - 10 to 14 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 4 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None

Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: Shallow loamy (1975) (R019XD060CA)

Minor Components

Rock outcrop

Percent of map unit: 10 percent

Escondido

Percent of map unit: 5 percent

Friant

Percent of map unit: 5 percent

ATTACHMENT 3

EXISTING HYDROLOGY CALCULATIONS

AREA CALCULATIONS

EXISTING HYDROLOGIC BASINS

Basin Number	Total Area SF	Total Area Acres	Impervious Area SF	Landscape Area SF	Pervious Pavers SF	Percent Impervious	C Value Weighted
EX-1 (N)	1,036,312	23.790	0	1,036,312	0	0.00%	0.35
EX-2 (N)	393,263	9.028	0	393,263	0	0.00%	0.35
EX-1 (S)	802,876	18.431	0	802,876	0	0.00%	0.35
EX-2 (S)	373,778	8.581	0	373,778	0	0.00%	0.35
TOTAL	2,606,229	59.831	0	2,606,229	0	0.00%	

EX1NORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/23/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1550.000(Ft.)
Highest elevation = 467.500(Ft.)
Lowest elevation = 363.500(Ft.)
Elevation difference = 104.000(Ft.) Slope = 6.710 %
Top of Initial Area Slope adjusted by User to 6.699 %
Bottom of Initial Area Slope adjusted by User to 6.699 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 6.70 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 7.16 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (6.699^{(1/3)})] = 7.16$
The initial area total distance of 1550.00 (Ft.) entered leaves a
remaining distance of 1450.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 6.01 minutes
for a distance of 1450.00 (Ft.) and a slope of 6.70 %
with an elevation difference of 97.14(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 6.009 Minutes
 $Tt = [(11.9 * 0.2746^3) / (97.14)]^{.385} = 6.01$
Total initial area Ti = 7.16 minutes from Figure 3-3 formula plus
6.01 minutes from the Figure 3-4 formula = 13.17 minutes

EX1NORTH
Rainfall intensity (I) = 3.950(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 32.888(CFS)
Total initial stream area = 23.790(Ac.)
End of computations, total study area = 23.790 (Ac.)

EX2NORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/23/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1143.000(Ft.)
Highest elevation = 450.000(Ft.)
Lowest elevation = 348.000(Ft.)
Elevation difference = 102.000(Ft.) Slope = 8.924 %
Top of Initial Area Slope adjusted by User to 8.814 %
Bottom of Initial Area Slope adjusted by User to 8.814 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.81 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.54 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (8.814^{(1/3)})] = 6.54$
The initial area total distance of 1143.00 (Ft.) entered leaves a
remaining distance of 1043.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 4.20 minutes
for a distance of 1043.00 (Ft.) and a slope of 8.81 %
with an elevation difference of 91.93(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 4.195 Minutes
 $Tt = [(11.9 * 0.1975^3) / (91.93)]^{.385} = 4.20$
Total initial area Ti = 6.54 minutes from Figure 3-3 formula plus
4.20 minutes from the Figure 3-4 formula = 10.73 minutes

EX2NORTH
Rainfall intensity (I) = 4.508(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 14.247(CFS)
Total initial stream area = 9.030(Ac.)
End of computations, total study area = 9.030 (Ac.)

EXPARCEL4S

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/22/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 101.000 to Point/Station 103.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1255.000(Ft.)
Highest elevation = 438.500(Ft.)
Lowest elevation = 328.000(Ft.)
Elevation difference = 110.500(Ft.) Slope = 8.805 %
Top of Initial Area Slope adjusted by User to 9.328 %
Bottom of Initial Area Slope adjusted by User to 9.328 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 9.33 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.41 minutes
 $TC = [1.8 * (1.1 - C) * \text{distance}(\text{Ft.})^{.5} / (\% \text{ slope}^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (9.328^{(1/3)})] = 6.41$
The initial area total distance of 1255.00 (Ft.) entered leaves a
remaining distance of 1155.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 4.44 minutes
for a distance of 1155.00 (Ft.) and a slope of 9.33 %
with an elevation difference of 107.74(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3 / (\text{elevation change}(\text{Ft.}))]^{.385} * 60(\text{min/hr})$
= 4.440 Minutes
 $Tt = [(11.9 * 0.2188^3) / (107.74)]^{.385} = 4.44$
Total initial area Ti = 6.41 minutes from Figure 3-3 formula plus
4.44 minutes from the Figure 3-4 formula = 10.85 minutes

EXPARCEL4S
Rainfall intensity (I) = 4.475(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 28.866(CFS)
Total initial stream area = 18.430(Ac.)
End of computations, total study area = 18.430 (Ac.)

EXPARCEL1S

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 03/16/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1121.000(Ft.)
Highest elevation = 438.500(Ft.)
Lowest elevation = 388.000(Ft.)
Elevation difference = 50.500(Ft.) Slope = 4.505 %
Top of Initial Area Slope adjusted by User to 3.652 %
Bottom of Initial Area Slope adjusted by User to 3.652 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 3.65 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.77 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (3.652^{(1/3)})] = 8.77$
The initial area total distance of 1121.00 (Ft.) entered leaves a
remaining distance of 1021.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 5.79 minutes
for a distance of 1021.00 (Ft.) and a slope of 3.65 %
with an elevation difference of 37.29(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 5.794 Minutes
 $Tt = [(11.9 * 0.1934^3) / (37.29)]^{.385} = 5.79$
Total initial area Ti = 8.77 minutes from Figure 3-3 formula plus
5.79 minutes from the Figure 3-4 formula = 14.56 minutes

EXPARCEL1S
Rainfall intensity (I) = 3.702(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 11.118(CFS)
Total initial stream area = 8.580(Ac.)
End of computations, total study area = 8.580 (Ac.)

ATTACHMENT 4

PROPOSED HYDROLOGY CALCULATIONS

AREA CALCULATIONS

PROPOSED HYDROLOGIC BASINS

Basin Number	Total Area SF	Total Area Acres	Impervious Area SF	Landscape Area SF	Pervious Pavers SF	Percent Impervious	C Value Weighted
SOUTH							
PR-4A	29,785	0.684	7,000	22,785	0	24%	0.50
PR-4B	697,062	16.002	0	697,062	0	0%	0.35
PR-4C	75,547	1.734	0	75,547	0	0%	0.35
PR-1A	22,355	0.513	7,000	15,355	0	31%	0.55
PR-1B	8,600	0.197	0	8,600	0	0%	0.35
PR-1C	342,823	7.870	0	342,823	0	0%	0.35
NORTH							
PR-4A	34,937	0.802	7,000	27,937	0	20%	0.48
PR-4B	21,573	0.495	21,573	0	0	100%	1.00
PR-4C	891,632	20.469	0	891,632	0	0%	0.35
PR-3A	39,968	0.918	7,000	32,968	0	18%	0.46
PR-3B	26,762	0.614	0	26,762	0	0%	0.35
PR-3C	27,381	0.629	0	27,381	0	0%	0.35
PR-2A	12,709	0.292	0	12,709	0	0%	0.35
PR-2B	51,305	1.178	7,000	44,305	0	14%	0.44
PR-2C	33,140	0.761	0	33,140	0	0%	0.35
PR-1.1	17,218	0.395	0	17,218	0	0%	0.35
PR-1.2	41,787	0.959	7,000	34,787	0	17%	0.46
PR-1.3	14,087	0.323	14,087	0	0	100%	1.00
PR-1.4	45,826	1.052	0	45,826	2	0%	0.35
PR-1.5	170,250	3.908	0	170,250	2	0%	0.35
TOTAL	2,604,747	59.797	77,660	2,527,087	0	3%	

NORTH SITE

PR1NORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 105.000 to Point/Station 106.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[INDUSTRIAL area type]
(General Industrial)
Impervious value, Ai = 0.950
Sub-Area C Value = 0.870
Initial subarea total flow distance = 384.000(Ft.)
Highest elevation = 398.930(Ft.)
Lowest elevation = 386.330(Ft.)
Elevation difference = 12.600(Ft.) Slope = 3.281 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of 3.28 %, in a development type of
General Industrial
In Accordance With Figure 3-3
Initial Area Time of Concentration = 2.49 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.8700) * (80.000^{.5}) / (3.281^{(1/3)})] = 2.49$
The initial area total distance of 384.00 (Ft.) entered leaves a
remaining distance of 304.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 2.38 minutes
for a distance of 304.00 (Ft.) and a slope of 3.28 %
with an elevation difference of 9.97(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 2.375 Minutes
 $Tt = [(11.9 * 0.0576^3) / (9.97)]^{.385} = 2.38$
Total initial area Ti = 2.49 minutes from Figure 3-3 formula plus
2.38 minutes from the Figure 3-4 formula = 4.87 minutes
Calculated TC of 4.867 minutes is less than 5 minutes,
resetting TC to 5.0 minutes for rainfall intensity calculations

PR1NORTH
Rainfall intensity (I) = 7.377(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.870
Subarea runoff = 2.054(CFS)
Total initial stream area = 0.320(Ac.)

+++++
Process from Point/Station 106.000 to Point/Station 102.000
**** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 386.330(Ft.)
Downstream point elevation = 383.000(Ft.)
Channel length thru subarea = 82.000(Ft.)
Channel base width = 0.000(Ft.)
Slope or 'Z' of left channel bank = 1.000
Slope or 'Z' of right channel bank = 1.000
Manning's 'N' = 0.015
Maximum depth of channel = 1.000(Ft.)
Flow(q) thru subarea = 2.054(CFS)
Depth of flow = 0.553(Ft.), Average velocity = 6.723(Ft/s)
Channel flow top width = 1.105(Ft.)
Flow Velocity = 6.72(Ft/s)
Travel time = 0.20 min.
Time of concentration = 5.07 min.
Critical depth = 0.766(Ft.)

+++++
Process from Point/Station 106.000 to Point/Station 102.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 0.320(Ac.)
Runoff from this stream = 2.054(CFS)
Time of concentration = 5.07 min.
Rainfall intensity = 7.311(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 280.000(Ft.)
Highest elevation = 388.150(Ft.)
Lowest elevation = 383.000(Ft.)
Elevation difference = 5.150(Ft.) Slope = 1.839 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.84 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.67 minutes
TC = $[1.8 * (1.1 - C) * \text{distance}(\text{Ft.})^{1.5}] / (\% \text{ slope}^{(1/3)})$
Page 2

PR1NORTH

TC = $[1.8 * (1.1 - 0.4600) * (85.000^{.5}) / (1.839^{(1/3)})] = 8.67$
 The initial area total distance of 280.00 (Ft.) entered leaves a
 remaining distance of 195.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 2.11 minutes
 for a distance of 195.00 (Ft.) and a slope of 1.84 %
 with an elevation difference of 3.59(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3 / (\text{elevation change}(\text{Ft.}))]^{.385} * 60(\text{min/hr})$
 = 2.109 Minutes
 $Tt = [(11.9 * 0.0369^3) / (3.59)]^{.385} = 2.11$
 Total initial area Ti = 8.67 minutes from Figure 3-3 formula plus
 2.11 minutes from the Figure 3-4 formula = 10.78 minutes
 Rainfall intensity (I) = 4.495(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.460
 Subarea runoff = 1.985(CFS)
 Total initial stream area = 0.960(Ac.)

+++++
 Process from Point/Station 101.000 to Point/Station 102.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 0.960(Ac.)
 Runoff from this stream = 1.985(CFS)
 Time of concentration = 10.78 min.
 Rainfall intensity = 4.495(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.054	5.07	7.311
2	1.985	10.78	4.495

Qmax(1) =

1.000 *	1.000 *	2.054) +	
1.000 *	0.470 *	1.985) + =	2.988

Qmax(2) =

0.615 *	1.000 *	2.054) +	
1.000 *	1.000 *	1.985) + =	3.248

Total of 2 main streams to confluence:

Flow rates before confluence point:

2.054 1.985

Maximum flow rates at confluence using above data:

2.988 3.248

Area of streams before confluence:

0.320 0.960

Results of confluence:

Total flow rate = 3.248(CFS)

Time of concentration = 10.778 min.

Effective stream area after confluence = 1.280(Ac.)

+++++
 Process from Point/Station 102.000 to Point/Station 104.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 380.000(Ft.)

Downstream point/station elevation = 374.960(Ft.)

PR1NORTH
Pipe length = 185.00(Ft.) Slope = 0.0272 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 3.248(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 3.248(CFS)
Normal flow depth in pipe = 6.37(In.)
Flow top width inside pipe = 11.98(In.)
Critical Depth = 9.25(In.)
Pipe flow velocity = 7.67(Ft/s)
Travel time through pipe = 0.40 min.
Time of concentration (TC) = 11.18 min.
End of computations, total study area = 1.280 (Ac.)

Detention Design

Pipe:

diameter 6 inches 0.50 ft
coefficient 0.013

$$Q = C_o A_o \sqrt{2g(H_o)} \quad (6-12)$$

where ...

Q = orifice flow discharge (ft³/s);
 C_o = orifice discharge coefficient;
 A_o = cross-sectional area of flow through the orifice (ft²);
 g = gravitational acceleration (32.2 ft/s²);
 H_o = effective head above orifice (ft); and

San Diego County Drainage Design Manual
July 2005

Page 6-11

C_o = 0.60 from Table 6.1 County Drainage Design Manual
 A_o = 0.20 sf
 g = 32.20 sf/sec
 C = 2.90

Stage	Depth (ft)	Effective Head (Ho)	Volume (cf)	Area (Ac.ft)	Orifice Flow (cfs)
383.00	0.00	0.00	0	0.000	0.00
383.50	0.50	0.25	1504	0.035	0.47
384.00	1.00	0.75	3477	0.080	0.82

Hydrology Parameters

Before Detention
Q= 3.240 cfs
A= 1.280 Acre
Tc= 10.78 min.
C= 0.870
I= 4.700 in/hr

After Detention
 Δt = 9.96 min.
Q= 0.736 cfs
A= 1.280 Acre
Tc= 20.74 min.

PR1NORTH2

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 105.000 to Point/Station 106.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[INDUSTRIAL area type]
(General Industrial)
Impervious value, Ai = 0.950
Sub-Area C Value = 0.870
Initial subarea total flow distance = 384.000(Ft.)
Highest elevation = 398.930(Ft.)
Lowest elevation = 386.330(Ft.)
Elevation difference = 12.600(Ft.) Slope = 3.281 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of 3.28 %, in a development type of
General Industrial
In Accordance With Figure 3-3
Initial Area Time of Concentration = 2.49 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.8700) * (80.000^{.5}) / (3.281^{(1/3)})] = 2.49$
The initial area total distance of 384.00 (Ft.) entered leaves a
remaining distance of 304.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 2.38 minutes
for a distance of 304.00 (Ft.) and a slope of 3.28 %
with an elevation difference of 9.97(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 2.375 Minutes
 $Tt = [(11.9 * 0.0576^3) / (9.97)]^{.385} = 2.38$
Total initial area Ti = 2.49 minutes from Figure 3-3 formula plus
2.38 minutes from the Figure 3-4 formula = 4.87 minutes
Calculated TC of 4.867 minutes is less than 5 minutes,
resetting TC to 5.0 minutes for rainfall intensity calculations

PR1NORTH2
Rainfall intensity (I) = 7.377(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.870
Subarea runoff = 2.054(CFS)
Total initial stream area = 0.320(Ac.)

+++++
Process from Point/Station 106.000 to Point/Station 102.000
**** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 386.330(Ft.)
Downstream point elevation = 383.000(Ft.)
Channel length thru subarea = 82.000(Ft.)
Channel base width = 0.000(Ft.)
Slope or 'Z' of left channel bank = 1.000
Slope or 'Z' of right channel bank = 1.000
Manning's 'N' = 0.015
Maximum depth of channel = 1.000(Ft.)
Flow(q) thru subarea = 2.054(CFS)
Depth of flow = 0.553(Ft.), Average velocity = 6.723(Ft/s)
Channel flow top width = 1.105(Ft.)
Flow Velocity = 6.72(Ft/s)
Travel time = 0.20 min.
Time of concentration = 5.07 min.
Critical depth = 0.766(Ft.)

+++++
Process from Point/Station 106.000 to Point/Station 102.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 0.320(Ac.)
Runoff from this stream = 2.054(CFS)
Time of concentration = 5.07 min.
Rainfall intensity = 7.311(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 280.000(Ft.)
Highest elevation = 388.150(Ft.)
Lowest elevation = 383.000(Ft.)
Elevation difference = 5.150(Ft.) Slope = 1.839 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.84 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.67 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5]/(% slope^(1/3))
Page 2

PR1NORTH2

TC = $[1.8 * (1.1 - 0.4600) * (85.000^{.5}) / (1.839^{(1/3)})] = 8.67$
 The initial area total distance of 280.00 (Ft.) entered leaves a
 remaining distance of 195.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 2.11 minutes
 for a distance of 195.00 (Ft.) and a slope of 1.84 %
 with an elevation difference of 3.59(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3 / (\text{elevation change}(\text{Ft.}))]^{.385} * 60(\text{min/hr})$
 = 2.109 Minutes
 $Tt = [(11.9 * 0.0369^3) / (3.59)]^{.385} = 2.11$
 Total initial area $Ti = 8.67$ minutes from Figure 3-3 formula plus
 2.11 minutes from the Figure 3-4 formula = 10.78 minutes
 Rainfall intensity (I) = 4.495(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.460
 Subarea runoff = 1.985(CFS)
 Total initial stream area = 0.960(Ac.)

+++++
 Process from Point/Station 101.000 to Point/Station 102.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 0.960(Ac.)
 Runoff from this stream = 1.985(CFS)
 Time of concentration = 10.78 min.
 Rainfall intensity = 4.495(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.054	5.07	7.311
2	1.985	10.78	4.495

Qmax(1) =

1.000 *	1.000 *	2.054) +	
1.000 *	0.470 *	1.985) + =	2.988

Qmax(2) =

0.615 *	1.000 *	2.054) +	
1.000 *	1.000 *	1.985) + =	3.248

Total of 2 main streams to confluence:

Flow rates before confluence point:

2.054 1.985

Maximum flow rates at confluence using above data:

2.988 3.248

Area of streams before confluence:

0.320 0.960

Results of confluence:

Total flow rate = 3.248(CFS)

Time of concentration = 10.778 min.

Effective stream area after confluence = 1.280(Ac.)

+++++
 Process from Point/Station 102.000 to Point/Station 104.000
 **** 6 HOUR HYDROGRAPH ****

PR1NORTH2

Time of Concentration = 10.78
 Basin Area = 1.28 Acres
 6 Hour Rainfall = 2.800 Inches
 Runoff Coefficient = 0.563
 Peak Discharge = 3.25 CFS

Time (Min)	Discharge (CFS)
0	0.000
10	0.121
20	0.123
30	0.128
40	0.130
50	0.136
60	0.139
70	0.146
80	0.149
90	0.157
100	0.162
110	0.172
120	0.178
130	0.190
140	0.198
150	0.215
160	0.225
170	0.250
180	0.265
190	0.303
200	0.329
210	0.402
220	0.458
230	0.673
240	0.948
250	3.248
260	0.539
270	0.361
280	0.282
290	0.237
300	0.206
310	0.184
320	0.167
330	0.153
340	0.142
350	0.133
360	0.125
370	0.118

+++++

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 1 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	0.8	1.6	2.4	3.2
0+ 0	0.0000	0.00	Q				
0+ 1	0.0000	0.01	Q				
0+ 2	0.0000	0.02	Q				
0+ 3	0.0001	0.04	Q				
0+ 4	0.0002	0.05	Q				
0+ 5	0.0002	0.06	Q				
0+ 6	0.0003	0.07	Q				
0+ 7	0.0005	0.08	VQ				

PR1NORTH2

0+ 8	0.0006	0.10	VQ
0+ 9	0.0007	0.11	VQ
0+10	0.0009	0.12	VQ
0+11	0.0011	0.12	VQ
0+12	0.0012	0.12	VQ
0+13	0.0014	0.12	VQ
0+14	0.0016	0.12	VQ
0+15	0.0017	0.12	VQ
0+16	0.0019	0.12	VQ
0+17	0.0021	0.12	VQ
0+18	0.0023	0.12	VQ
0+19	0.0024	0.12	VQ
0+20	0.0026	0.12	VQ
0+21	0.0028	0.12	VQ
0+22	0.0029	0.12	VQ
0+23	0.0031	0.12	VQ
0+24	0.0033	0.12	VQ
0+25	0.0034	0.13	VQ
0+26	0.0036	0.13	VQ
0+27	0.0038	0.13	VQ
0+28	0.0040	0.13	VQ
0+29	0.0041	0.13	VQ
0+30	0.0043	0.13	Q
0+31	0.0045	0.13	Q
0+32	0.0047	0.13	Q
0+33	0.0049	0.13	Q
0+34	0.0050	0.13	Q
0+35	0.0052	0.13	Q
0+36	0.0054	0.13	Q
0+37	0.0056	0.13	Q
0+38	0.0057	0.13	Q
0+39	0.0059	0.13	Q
0+40	0.0061	0.13	Q
0+41	0.0063	0.13	Q
0+42	0.0065	0.13	Q
0+43	0.0066	0.13	Q
0+44	0.0068	0.13	Q
0+45	0.0070	0.13	Q
0+46	0.0072	0.13	Q
0+47	0.0074	0.13	Q
0+48	0.0076	0.13	Q
0+49	0.0077	0.14	Q
0+50	0.0079	0.14	Q
0+51	0.0081	0.14	Q
0+52	0.0083	0.14	QV
0+53	0.0085	0.14	QV
0+54	0.0087	0.14	QV
0+55	0.0089	0.14	QV
0+56	0.0091	0.14	QV
0+57	0.0093	0.14	QV
0+58	0.0094	0.14	QV
0+59	0.0096	0.14	QV
1+ 0	0.0098	0.14	QV
1+ 1	0.0100	0.14	QV
1+ 2	0.0102	0.14	QV
1+ 3	0.0104	0.14	QV
1+ 4	0.0106	0.14	QV
1+ 5	0.0108	0.14	QV
1+ 6	0.0110	0.14	QV
1+ 7	0.0112	0.14	QV
1+ 8	0.0114	0.14	QV
1+ 9	0.0116	0.14	QV
1+10	0.0118	0.15	QV

PR1NORTH2

1+11	0.0120	0.15	QV
1+12	0.0122	0.15	QV
1+13	0.0124	0.15	QV
1+14	0.0126	0.15	Q V
1+15	0.0128	0.15	Q V
1+16	0.0130	0.15	Q V
1+17	0.0132	0.15	Q V
1+18	0.0134	0.15	Q V
1+19	0.0136	0.15	Q V
1+20	0.0138	0.15	Q V
1+21	0.0140	0.15	Q V
1+22	0.0142	0.15	Q V
1+23	0.0145	0.15	Q V
1+24	0.0147	0.15	Q V
1+25	0.0149	0.15	Q V
1+26	0.0151	0.15	Q V
1+27	0.0153	0.15	Q V
1+28	0.0155	0.16	Q V
1+29	0.0157	0.16	Q V
1+30	0.0159	0.16	Q V
1+31	0.0162	0.16	Q V
1+32	0.0164	0.16	Q V
1+33	0.0166	0.16	Q V
1+34	0.0168	0.16	Q V
1+35	0.0170	0.16	Q V
1+36	0.0173	0.16	Q V
1+37	0.0175	0.16	Q V
1+38	0.0177	0.16	Q V
1+39	0.0179	0.16	Q V
1+40	0.0182	0.16	Q V
1+41	0.0184	0.16	Q V
1+42	0.0186	0.16	Q V
1+43	0.0188	0.16	Q V
1+44	0.0191	0.17	Q V
1+45	0.0193	0.17	Q V
1+46	0.0195	0.17	Q V
1+47	0.0198	0.17	Q V
1+48	0.0200	0.17	Q V
1+49	0.0202	0.17	Q V
1+50	0.0205	0.17	Q V
1+51	0.0207	0.17	Q V
1+52	0.0209	0.17	Q V
1+53	0.0212	0.17	Q V
1+54	0.0214	0.17	Q V
1+55	0.0217	0.17	Q V
1+56	0.0219	0.18	Q V
1+57	0.0221	0.18	Q V
1+58	0.0224	0.18	Q V
1+59	0.0226	0.18	Q V
2+ 0	0.0229	0.18	Q V
2+ 1	0.0231	0.18	Q V
2+ 2	0.0234	0.18	Q V
2+ 3	0.0236	0.18	Q V
2+ 4	0.0239	0.18	Q V
2+ 5	0.0241	0.18	Q V
2+ 6	0.0244	0.19	Q V
2+ 7	0.0246	0.19	Q V
2+ 8	0.0249	0.19	Q V
2+ 9	0.0251	0.19	Q V
2+10	0.0254	0.19	Q V
2+11	0.0257	0.19	Q V
2+12	0.0259	0.19	Q V
2+13	0.0262	0.19	Q V

PR1NORTH2

2+14	0.0265	0.19	Q	V
2+15	0.0267	0.19	Q	V
2+16	0.0270	0.19	Q	V
2+17	0.0273	0.20	Q	V
2+18	0.0275	0.20	Q	V
2+19	0.0278	0.20	Q	V
2+20	0.0281	0.20	Q	V
2+21	0.0284	0.20	Q	V
2+22	0.0286	0.20	Q	V
2+23	0.0289	0.20	Q	V
2+24	0.0292	0.20	Q	V
2+25	0.0295	0.21	Q	V
2+26	0.0298	0.21	Q	V
2+27	0.0301	0.21	Q	V
2+28	0.0304	0.21	Q	V
2+29	0.0306	0.21	Q	V
2+30	0.0309	0.21	Q	V
2+31	0.0312	0.22	Q	V
2+32	0.0315	0.22	Q	V
2+33	0.0318	0.22	Q	V
2+34	0.0321	0.22	Q	V
2+35	0.0324	0.22	Q	V
2+36	0.0327	0.22	Q	V
2+37	0.0331	0.22	Q	V
2+38	0.0334	0.22	Q	V
2+39	0.0337	0.22	Q	V
2+40	0.0340	0.23	Q	V
2+41	0.0343	0.23	Q	V
2+42	0.0346	0.23	Q	V
2+43	0.0349	0.23	Q	V
2+44	0.0353	0.23	Q	V
2+45	0.0356	0.24	Q	V
2+46	0.0359	0.24	Q	V
2+47	0.0362	0.24	Q	V
2+48	0.0366	0.24	Q	V
2+49	0.0369	0.25	Q	V
2+50	0.0373	0.25	Q	V
2+51	0.0376	0.25	Q	V
2+52	0.0380	0.25	Q	V
2+53	0.0383	0.25	Q	V
2+54	0.0387	0.26	Q	V
2+55	0.0390	0.26	Q	V
2+56	0.0394	0.26	Q	V
2+57	0.0397	0.26	Q	V
2+58	0.0401	0.26	Q	V
2+59	0.0405	0.26	Q	V
3+ 0	0.0408	0.26	Q	V
3+ 1	0.0412	0.27	Q	V
3+ 2	0.0416	0.27	Q	V
3+ 3	0.0419	0.28	Q	V
3+ 4	0.0423	0.28	Q	V
3+ 5	0.0427	0.28	Q	V
3+ 6	0.0431	0.29	Q	V
3+ 7	0.0435	0.29	Q	V
3+ 8	0.0439	0.30	Q	V
3+ 9	0.0443	0.30	Q	V
3+10	0.0448	0.30	Q	V
3+11	0.0452	0.31	Q	V
3+12	0.0456	0.31	Q	V
3+13	0.0460	0.31	Q	V
3+14	0.0465	0.31	Q	V
3+15	0.0469	0.32	Q	V
3+16	0.0473	0.32	Q	V

			PR1NORTH2			
3+17	0.0478	0.32	Q	V		
3+18	0.0482	0.32	Q	V		
3+19	0.0487	0.33	Q	V		
3+20	0.0491	0.33	Q	V		
3+21	0.0496	0.34	Q	V		
3+22	0.0501	0.34	Q	V		
3+23	0.0506	0.35	Q	V		
3+24	0.0510	0.36	Q	V		
3+25	0.0515	0.37	Q	V		
3+26	0.0521	0.37	Q	V		
3+27	0.0526	0.38	Q	V		
3+28	0.0531	0.39	Q	V		
3+29	0.0537	0.39	Q	V		
3+30	0.0542	0.40	Q	V		
3+31	0.0548	0.41	Q	V		
3+32	0.0553	0.41	Q	V		
3+33	0.0559	0.42	Q	V		
3+34	0.0565	0.42	Q	V		
3+35	0.0571	0.43	Q	V		
3+36	0.0577	0.44	Q	V		
3+37	0.0583	0.44	Q	V		
3+38	0.0589	0.45	Q	V		
3+39	0.0595	0.45	Q	V		
3+40	0.0602	0.46	Q	V		
3+41	0.0608	0.48	Q	V		
3+42	0.0615	0.50	Q	V		
3+43	0.0622	0.52	Q	V		
3+44	0.0630	0.54	Q	V		
3+45	0.0638	0.57	Q	V		
3+46	0.0646	0.59	Q	V		
3+47	0.0654	0.61	Q	V		
3+48	0.0663	0.63	Q	V		
3+49	0.0672	0.65	Q	V		
3+50	0.0681	0.67	Q	V		
3+51	0.0691	0.70	Q	V		
3+52	0.0701	0.73	Q	V		
3+53	0.0711	0.76	Q	V		
3+54	0.0722	0.78	Q	V		
3+55	0.0733	0.81	Q	V		
3+56	0.0745	0.84	Q	V		
3+57	0.0757	0.87	Q	V		
3+58	0.0769	0.89	Q	V		
3+59	0.0782	0.92	Q	V		
4+ 0	0.0795	0.95	Q	V		
4+ 1	0.0811	1.18		Q		
4+ 2	0.0830	1.41		Q		
4+ 3	0.0853	1.64		Q		
4+ 4	0.0879	1.87		Q		
4+ 5	0.0907	2.10		Q		
4+ 6	0.0939	2.33		Q		
4+ 7	0.0975	2.56		Q		
4+ 8	0.1013	2.79		Q		
4+ 9	0.1055	3.02		Q		
4+10	0.1099	3.25		Q		
4+11	0.1140	2.98		Q		
4+12	0.1178	2.71		Q		
4+13	0.1211	2.44		Q		
4+14	0.1241	2.16		Q		
4+15	0.1267	1.89		Q		
4+16	0.1289	1.62		Q		
4+17	0.1308	1.35		Q		
4+18	0.1323	1.08		Q		
4+19	0.1334	0.81		Q		

			PR1NORTH2			
4+20	0.1342	0.54		Q		V
4+21	0.1349	0.52		Q		V
4+22	0.1356	0.50		Q		V
4+23	0.1362	0.49		Q		V
4+24	0.1369	0.47		Q		V
4+25	0.1375	0.45		Q		V
4+26	0.1381	0.43		Q		V
4+27	0.1387	0.41		Q		V
4+28	0.1392	0.40		Q		V
4+29	0.1397	0.38		Q		V
4+30	0.1402	0.36		Q		V
4+31	0.1407	0.35		Q		V
4+32	0.1412	0.35		Q		V
4+33	0.1417	0.34		Q		V
4+34	0.1421	0.33		Q		V
4+35	0.1426	0.32		Q		V
4+36	0.1430	0.31		Q		V
4+37	0.1434	0.31		Q		V
4+38	0.1438	0.30		Q		V
4+39	0.1442	0.29		Q		V
4+40	0.1446	0.28		Q		V
4+41	0.1450	0.28		Q		V
4+42	0.1454	0.27		Q		V
4+43	0.1457	0.27		Q		V
4+44	0.1461	0.26		Q		V
4+45	0.1465	0.26		Q		V
4+46	0.1468	0.25		Q		V
4+47	0.1472	0.25		Q		V
4+48	0.1475	0.25		Q		V
4+49	0.1478	0.24		Q		V
4+50	0.1482	0.24		Q		V
4+51	0.1485	0.23		Q		V
4+52	0.1488	0.23		Q		V
4+53	0.1491	0.23		Q		V
4+54	0.1494	0.22		Q		V
4+55	0.1497	0.22		Q		V
4+56	0.1500	0.22		Q		V
4+57	0.1503	0.22		Q		V
4+58	0.1506	0.21		Q		V
4+59	0.1509	0.21		Q		V
5+ 0	0.1512	0.21		Q		V
5+ 1	0.1515	0.20		Q		V
5+ 2	0.1517	0.20		Q		V
5+ 3	0.1520	0.20		Q		V
5+ 4	0.1523	0.20		Q		V
5+ 5	0.1526	0.19		Q		V
5+ 6	0.1528	0.19		Q		V
5+ 7	0.1531	0.19		Q		V
5+ 8	0.1533	0.19		Q		V
5+ 9	0.1536	0.19		Q		V
5+10	0.1538	0.18		Q		V
5+11	0.1541	0.18		Q		V
5+12	0.1543	0.18		Q		V
5+13	0.1546	0.18		Q		V
5+14	0.1548	0.18		Q		V
5+15	0.1551	0.18		Q		V
5+16	0.1553	0.17		Q		V
5+17	0.1556	0.17		Q		V
5+18	0.1558	0.17		Q		V
5+19	0.1560	0.17		Q		V
5+20	0.1563	0.17		Q		V
5+21	0.1565	0.17		Q		V
5+22	0.1567	0.16		Q		V

				PR1NORTH2					
5+23	0.1569	0.16	Q					V	
5+24	0.1572	0.16	Q					V	
5+25	0.1574	0.16	Q					V	
5+26	0.1576	0.16	Q					V	
5+27	0.1578	0.16	Q					V	
5+28	0.1580	0.16	Q					V	
5+29	0.1582	0.15	Q					V	
5+30	0.1584	0.15	Q					V	
5+31	0.1587	0.15	Q					V	
5+32	0.1589	0.15	Q					V	
5+33	0.1591	0.15	Q					V	
5+34	0.1593	0.15	Q					V	
5+35	0.1595	0.15	Q					V	
5+36	0.1597	0.15	Q					V	
5+37	0.1599	0.15	Q					V	
5+38	0.1601	0.14	Q					V	
5+39	0.1603	0.14	Q					V	
5+40	0.1605	0.14	Q					V	
5+41	0.1607	0.14	Q					V	
5+42	0.1609	0.14	Q					V	
5+43	0.1611	0.14	Q					V	
5+44	0.1612	0.14	Q					V	
5+45	0.1614	0.14	Q					V	
5+46	0.1616	0.14	Q					V	
5+47	0.1618	0.14	Q					V	
5+48	0.1620	0.13	Q					V	
5+49	0.1622	0.13	Q					V	
5+50	0.1624	0.13	Q					V	
5+51	0.1625	0.13	Q					V	
5+52	0.1627	0.13	Q					V	
5+53	0.1629	0.13	Q					V	
5+54	0.1631	0.13	Q					V	
5+55	0.1633	0.13	Q					V	
5+56	0.1634	0.13	Q					V	
5+57	0.1636	0.13	Q					V	
5+58	0.1638	0.13	Q					V	
5+59	0.1640	0.13	Q					V	
6+ 0	0.1641	0.13	Q					V	
6+ 1	0.1643	0.12	Q					V	
6+ 2	0.1645	0.12	Q					V	
6+ 3	0.1646	0.12	Q					V	
6+ 4	0.1648	0.12	Q					V	
6+ 5	0.1650	0.12	Q					V	
6+ 6	0.1651	0.12	Q					V	
6+ 7	0.1653	0.12	Q					V	
6+ 8	0.1655	0.12	Q					V	
6+ 9	0.1656	0.12	Q					V	
6+10	0.1658	0.12	Q					V	

End of computations, total study area =

1.280 (Ac.)

PR1NORTHDET

FLOOD HYDROGRAPH ROUTING PROGRAM
 Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
 Study date: 09/24/15

 Program License Serial Number 6313

***** HYDROGRAPH INFORMATION *****

From study/file name: PR1NORTH2.rte
 *****HYDROGRAPH DATA*****
 Number of intervals = 370
 Time interval = 1.0 (Min.)
 Maximum/Peak flow rate = 3.248 (CFS)
 Total volume = 0.166 (Ac.Ft)
 Status of hydrographs being held in storage
 Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
 Peak (CFS) 0.000 0.000 0.000 0.000 0.000
 Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

+++++
 Process from Point/Station 102.000 to Point/Station 104.000
 **** RETARDING BASIN ROUTING ****

 User entry of depth-outflow-storage data

 Total number of inflow hydrograph intervals = 370
 Hydrograph time unit = 1.000 (Min.)
 Initial depth in storage basin = 0.00(Ft.)

 Initial basin depth = 0.00 (Ft.)
 Initial basin storage = 0.00 (Ac.Ft)
 Initial basin outflow = 0.00 (CFS)

 Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-0*dt/2) (Ac.Ft)	(S+0*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.035	0.470	0.035	0.035
1.000	0.080	0.820	0.079	0.081

 Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	0	0.8	1.62	2.44	3.25	Depth (Ft.)
0.017	0.01	0.00	0.000	0					0.00

PR1NORTHDET									
0.033	0.02	0.00	0.000	0					0.00
0.050	0.04	0.00	0.000	0					0.00
0.067	0.05	0.00	0.000	0					0.00
0.083	0.06	0.00	0.000	0					0.00
0.100	0.07	0.00	0.000	0					0.00
0.117	0.08	0.01	0.000	0					0.01
0.133	0.10	0.01	0.001	0					0.01
0.150	0.11	0.01	0.001	OI					0.01
0.167	0.12	0.01	0.001	OI					0.01
0.183	0.12	0.01	0.001	OI					0.01
0.200	0.12	0.01	0.001	OI					0.02
0.217	0.12	0.02	0.001	OI					0.02
0.233	0.12	0.02	0.001	OI					0.02
0.250	0.12	0.02	0.002	OI					0.02
0.267	0.12	0.02	0.002	OI					0.02
0.283	0.12	0.02	0.002	OI					0.03
0.300	0.12	0.03	0.002	OI					0.03
0.317	0.12	0.03	0.002	OI					0.03
0.333	0.12	0.03	0.002	OI					0.03
0.350	0.12	0.03	0.002	OI					0.03
0.367	0.12	0.03	0.002	OI					0.03
0.383	0.12	0.03	0.003	OI					0.04
0.400	0.12	0.04	0.003	OI					0.04
0.417	0.13	0.04	0.003	OI					0.04
0.433	0.13	0.04	0.003	OI					0.04
0.450	0.13	0.04	0.003	OI					0.04
0.467	0.13	0.04	0.003	OI					0.05
0.483	0.13	0.04	0.003	OI					0.05
0.500	0.13	0.05	0.003	OI					0.05
0.517	0.13	0.05	0.004	OI					0.05
0.533	0.13	0.05	0.004	OI					0.05
0.550	0.13	0.05	0.004	OI					0.05
0.567	0.13	0.05	0.004	OI					0.05
0.583	0.13	0.05	0.004	OI					0.06
0.600	0.13	0.05	0.004	OI					0.06
0.617	0.13	0.06	0.004	OI					0.06
0.633	0.13	0.06	0.004	OI					0.06
0.650	0.13	0.06	0.004	OI					0.06
0.667	0.13	0.06	0.004	OI					0.06
0.683	0.13	0.06	0.005	OI					0.06
0.700	0.13	0.06	0.005	OI					0.07
0.717	0.13	0.06	0.005	OI					0.07
0.733	0.13	0.06	0.005	OI					0.07
0.750	0.13	0.07	0.005	OI					0.07
0.767	0.13	0.07	0.005	OI					0.07
0.783	0.13	0.07	0.005	OI					0.07
0.800	0.13	0.07	0.005	OI					0.07
0.817	0.14	0.07	0.005	OI					0.08
0.833	0.14	0.07	0.005	OI					0.08
0.850	0.14	0.07	0.005	OI					0.08
0.867	0.14	0.07	0.006	OI					0.08
0.883	0.14	0.08	0.006	OI					0.08
0.900	0.14	0.08	0.006	OI					0.08
0.917	0.14	0.08	0.006	OI					0.08
0.933	0.14	0.08	0.006	OI					0.08
0.950	0.14	0.08	0.006	OI					0.09
0.967	0.14	0.08	0.006	OI					0.09
0.983	0.14	0.08	0.006	OI					0.09
1.000	0.14	0.08	0.006	OI					0.09
1.017	0.14	0.08	0.006	OI					0.09
1.033	0.14	0.09	0.006	OI					0.09
1.050	0.14	0.09	0.006	OI					0.09
1.067	0.14	0.09	0.006	OI					0.09

PR1NORTHDET					
1.083	0.14	0.09	0.007	OI	0.09
1.100	0.14	0.09	0.007	OI	0.09
1.117	0.14	0.09	0.007	OI	0.10
1.133	0.14	0.09	0.007	OI	0.10
1.150	0.14	0.09	0.007	OI	0.10
1.167	0.15	0.09	0.007	OI	0.10
1.183	0.15	0.09	0.007	OI	0.10
1.200	0.15	0.10	0.007	OI	0.10
1.217	0.15	0.10	0.007	OI	0.10
1.233	0.15	0.10	0.007	OI	0.10
1.250	0.15	0.10	0.007	OI	0.10
1.267	0.15	0.10	0.007	OI	0.11
1.283	0.15	0.10	0.007	OI	0.11
1.300	0.15	0.10	0.007	OI	0.11
1.317	0.15	0.10	0.008	OI	0.11
1.333	0.15	0.10	0.008	0	0.11
1.350	0.15	0.10	0.008	0	0.11
1.367	0.15	0.10	0.008	0	0.11
1.383	0.15	0.10	0.008	0	0.11
1.400	0.15	0.11	0.008	0	0.11
1.417	0.15	0.11	0.008	0	0.11
1.433	0.15	0.11	0.008	0	0.11
1.450	0.15	0.11	0.008	0	0.12
1.467	0.16	0.11	0.008	0	0.12
1.483	0.16	0.11	0.008	0	0.12
1.500	0.16	0.11	0.008	0	0.12
1.517	0.16	0.11	0.008	0	0.12
1.533	0.16	0.11	0.008	0	0.12
1.550	0.16	0.11	0.008	0	0.12
1.567	0.16	0.11	0.009	0	0.12
1.583	0.16	0.12	0.009	0	0.12
1.600	0.16	0.12	0.009	0	0.12
1.617	0.16	0.12	0.009	0	0.12
1.633	0.16	0.12	0.009	0	0.13
1.650	0.16	0.12	0.009	0	0.13
1.667	0.16	0.12	0.009	0	0.13
1.683	0.16	0.12	0.009	0	0.13
1.700	0.16	0.12	0.009	0	0.13
1.717	0.16	0.12	0.009	0	0.13
1.733	0.17	0.12	0.009	0	0.13
1.750	0.17	0.12	0.009	0	0.13
1.767	0.17	0.12	0.009	0	0.13
1.783	0.17	0.12	0.009	0	0.13
1.800	0.17	0.13	0.009	0	0.13
1.817	0.17	0.13	0.009	0	0.13
1.833	0.17	0.13	0.009	0	0.14
1.850	0.17	0.13	0.010	0	0.14
1.867	0.17	0.13	0.010	0	0.14
1.883	0.17	0.13	0.010	0	0.14
1.900	0.17	0.13	0.010	0	0.14
1.917	0.17	0.13	0.010	0	0.14
1.933	0.18	0.13	0.010	0	0.14
1.950	0.18	0.13	0.010	0	0.14
1.967	0.18	0.13	0.010	0	0.14
1.983	0.18	0.13	0.010	0	0.14
2.000	0.18	0.14	0.010	0	0.14
2.017	0.18	0.14	0.010	0	0.14
2.033	0.18	0.14	0.010	0	0.15
2.050	0.18	0.14	0.010	0	0.15
2.067	0.18	0.14	0.010	0	0.15
2.083	0.18	0.14	0.010	0	0.15
2.100	0.19	0.14	0.010	0	0.15
2.117	0.19	0.14	0.010	0	0.15

PR1NORTHDET									
2.133	0.19	0.14	0.011	0					0.15
2.150	0.19	0.14	0.011	0					0.15
2.167	0.19	0.14	0.011	0					0.15
2.183	0.19	0.14	0.011	0					0.15
2.200	0.19	0.15	0.011	0					0.15
2.217	0.19	0.15	0.011	0					0.16
2.233	0.19	0.15	0.011	0					0.16
2.250	0.19	0.15	0.011	0					0.16
2.267	0.19	0.15	0.011	0					0.16
2.283	0.20	0.15	0.011	0					0.16
2.300	0.20	0.15	0.011	0					0.16
2.317	0.20	0.15	0.011	0					0.16
2.333	0.20	0.15	0.011	0					0.16
2.350	0.20	0.15	0.011	0					0.16
2.367	0.20	0.15	0.011	0					0.16
2.383	0.20	0.15	0.012	0					0.16
2.400	0.20	0.16	0.012	OI					0.17
2.417	0.21	0.16	0.012	OI					0.17
2.433	0.21	0.16	0.012	OI					0.17
2.450	0.21	0.16	0.012	OI					0.17
2.467	0.21	0.16	0.012	OI					0.17
2.483	0.21	0.16	0.012	OI					0.17
2.500	0.21	0.16	0.012	OI					0.17
2.517	0.22	0.16	0.012	OI					0.17
2.533	0.22	0.16	0.012	OI					0.17
2.550	0.22	0.16	0.012	OI					0.17
2.567	0.22	0.17	0.012	OI					0.18
2.583	0.22	0.17	0.012	OI					0.18
2.600	0.22	0.17	0.012	OI					0.18
2.617	0.22	0.17	0.013	OI					0.18
2.633	0.22	0.17	0.013	OI					0.18
2.650	0.22	0.17	0.013	OI					0.18
2.667	0.23	0.17	0.013	OI					0.18
2.683	0.23	0.17	0.013	OI					0.18
2.700	0.23	0.17	0.013	OI					0.18
2.717	0.23	0.17	0.013	OI					0.19
2.733	0.23	0.18	0.013	OI					0.19
2.750	0.24	0.18	0.013	OI					0.19
2.767	0.24	0.18	0.013	OI					0.19
2.783	0.24	0.18	0.013	OI					0.19
2.800	0.24	0.18	0.013	OI					0.19
2.817	0.25	0.18	0.013	OI					0.19
2.833	0.25	0.18	0.014	OI					0.19
2.850	0.25	0.18	0.014	OI					0.20
2.867	0.25	0.18	0.014	OI					0.20
2.883	0.25	0.19	0.014	OI					0.20
2.900	0.26	0.19	0.014	OI					0.20
2.917	0.26	0.19	0.014	OI					0.20
2.933	0.26	0.19	0.014	OI					0.20
2.950	0.26	0.19	0.014	OI					0.20
2.967	0.26	0.19	0.014	OI					0.20
2.983	0.26	0.19	0.014	OI					0.21
3.000	0.26	0.20	0.015	OI					0.21
3.017	0.27	0.20	0.015	OI					0.21
3.033	0.27	0.20	0.015	OI					0.21
3.050	0.28	0.20	0.015	OI					0.21
3.067	0.28	0.20	0.015	OI					0.21
3.083	0.28	0.20	0.015	OI					0.22
3.100	0.29	0.20	0.015	0					0.22
3.117	0.29	0.21	0.015	0					0.22
3.133	0.30	0.21	0.015	0					0.22
3.150	0.30	0.21	0.016	0					0.22
3.167	0.30	0.21	0.016	0					0.22

				PR1NORTHDET							
4.233	2.16	0.70	0.064		0				I		0.82
4.250	1.89	0.71	0.066		0				I		0.84
4.267	1.62	0.72	0.067		0						0.86
4.283	1.35	0.73	0.068		0				I		0.87
4.300	1.08	0.73	0.069		0		I				0.88
4.317	0.81	0.74	0.069		0						0.88
4.333	0.54	0.74	0.069		I	0					0.88
4.350	0.52	0.73	0.069		I	0					0.88
4.367	0.50	0.73	0.069		I	0					0.87
4.383	0.49	0.73	0.068		I	0					0.87
4.400	0.47	0.73	0.068		I	0					0.87
4.417	0.45	0.72	0.068		I	0					0.86
4.433	0.43	0.72	0.067		I	0					0.86
4.450	0.41	0.72	0.067		I	0					0.85
4.467	0.40	0.71	0.066		I	0					0.85
4.483	0.38	0.71	0.066		I	0					0.84
4.500	0.36	0.71	0.065		I	0					0.84
4.517	0.35	0.70	0.065		I	0					0.83
4.533	0.35	0.70	0.064		I	0					0.83
4.550	0.34	0.70	0.064		I	0					0.82
4.567	0.33	0.69	0.063		I	0					0.82
4.583	0.32	0.69	0.063		I	0					0.81
4.600	0.31	0.68	0.062		I	0					0.81
4.617	0.31	0.68	0.062		I	0					0.80
4.633	0.30	0.68	0.061		I	0					0.79
4.650	0.29	0.67	0.061		I	0					0.79
4.667	0.28	0.67	0.060		I	0					0.78
4.683	0.28	0.66	0.060		I	0					0.78
4.700	0.27	0.66	0.059		I	0					0.77
4.717	0.27	0.66	0.059		I	0					0.76
4.733	0.26	0.65	0.058		I	0					0.76
4.750	0.26	0.65	0.058		I	0					0.75
4.767	0.25	0.64	0.057		I	0					0.75
4.783	0.25	0.64	0.057		I	0					0.74
4.800	0.25	0.63	0.056		I	0					0.73
4.817	0.24	0.63	0.056		I	0					0.73
4.833	0.24	0.63	0.055		I	0					0.72
4.850	0.23	0.62	0.055		I	0					0.72
4.867	0.23	0.62	0.054		I	0					0.71
4.883	0.23	0.61	0.053		I	0					0.71
4.900	0.22	0.61	0.053		I	0					0.70
4.917	0.22	0.61	0.052		I	0					0.69
4.933	0.22	0.60	0.052		I	0					0.69
4.950	0.22	0.60	0.051		I	0					0.68
4.967	0.21	0.59	0.051		I	0					0.68
4.983	0.21	0.59	0.050		I	0					0.67
5.000	0.21	0.58	0.050		I	0					0.66
5.017	0.20	0.58	0.049		I	0					0.66
5.033	0.20	0.58	0.049		I	0					0.65
5.050	0.20	0.57	0.048		I	0					0.65
5.067	0.20	0.57	0.048		I	0					0.64
5.083	0.19	0.56	0.047		I	0					0.64
5.100	0.19	0.56	0.047		I	0					0.63
5.117	0.19	0.56	0.046		I	0					0.62
5.133	0.19	0.55	0.046		I	0					0.62
5.150	0.19	0.55	0.045		I	0					0.61
5.167	0.18	0.55	0.045		I	0					0.61
5.183	0.18	0.54	0.044		I	0					0.60
5.200	0.18	0.54	0.044		I	0					0.60
5.217	0.18	0.53	0.043		I	0					0.59
5.233	0.18	0.53	0.043		I	0					0.59
5.250	0.18	0.53	0.042		I	0					0.58
5.267	0.17	0.52	0.042		I	0					0.57

PR1NORTHDET						
5.283	0.17	0.52	0.041	I 0		0.57
5.300	0.17	0.51	0.041	I 0		0.56
5.317	0.17	0.51	0.040	I 0		0.56
5.333	0.17	0.51	0.040	I 0		0.55
5.350	0.17	0.50	0.039	I 0		0.55
5.367	0.16	0.50	0.039	I 0		0.54
5.383	0.16	0.50	0.038	I 0		0.54
5.400	0.16	0.49	0.038	I 0		0.53
5.417	0.16	0.49	0.038	I 0		0.53
5.433	0.16	0.49	0.037	I 0		0.52
5.450	0.16	0.48	0.037	I 0		0.52
5.467	0.16	0.48	0.036	I 0		0.51
5.483	0.15	0.48	0.036	I 0		0.51
5.500	0.15	0.47	0.035	I 0		0.50
5.517	0.15	0.47	0.035	I 0		0.50
5.533	0.15	0.46	0.034	I 0		0.49
5.550	0.15	0.46	0.034	I 0		0.49
5.567	0.15	0.45	0.034	I 0		0.48
5.583	0.15	0.45	0.033	I 0		0.47
5.600	0.15	0.44	0.033	I 0		0.47
5.617	0.15	0.43	0.032	I 0		0.46
5.633	0.14	0.43	0.032	I 0		0.46
5.650	0.14	0.42	0.032	I 0		0.45
5.667	0.14	0.42	0.031	I 0		0.45
5.683	0.14	0.41	0.031	I 0		0.44
5.700	0.14	0.41	0.030	I 0		0.43
5.717	0.14	0.40	0.030	I 0		0.43
5.733	0.14	0.40	0.030	I 0		0.42
5.750	0.14	0.39	0.029	I 0		0.42
5.767	0.14	0.39	0.029	I 0		0.41
5.783	0.14	0.38	0.029	I 0		0.41
5.800	0.13	0.38	0.028	I 0		0.40
5.817	0.13	0.38	0.028	I 0		0.40
5.833	0.13	0.37	0.028	I 0		0.40
5.850	0.13	0.37	0.027	I 0		0.39
5.867	0.13	0.36	0.027	I 0		0.39
5.883	0.13	0.36	0.027	I 0		0.38
5.900	0.13	0.35	0.026	I 0		0.38
5.917	0.13	0.35	0.026	I 0		0.37
5.933	0.13	0.35	0.026	I 0		0.37
5.950	0.13	0.34	0.025	I 0		0.36
5.967	0.13	0.34	0.025	I 0		0.36
5.983	0.13	0.33	0.025	I 0		0.36
6.000	0.13	0.33	0.025	I 0		0.35
6.017	0.12	0.33	0.024	I 0		0.35
6.033	0.12	0.32	0.024	I 0		0.34
6.050	0.12	0.32	0.024	I 0		0.34
6.067	0.12	0.32	0.024	I 0		0.34
6.083	0.12	0.31	0.023	I 0		0.33
6.100	0.12	0.31	0.023	I 0		0.33
6.117	0.12	0.31	0.023	I 0		0.32
6.133	0.12	0.30	0.022	IO		0.32
6.150	0.12	0.30	0.022	IO		0.32
6.167	0.12	0.30	0.022	IO		0.31
6.183	0.00	0.29	0.022	I 0		0.31
6.200	0.00	0.29	0.021	I 0		0.30
6.217	0.00	0.28	0.021	I 0		0.30
6.233	0.00	0.28	0.020	I 0		0.29
6.250	0.00	0.27	0.020	I 0		0.29
6.267	0.00	0.27	0.020	I 0		0.28
6.283	0.00	0.26	0.019	I 0		0.28
6.300	0.00	0.26	0.019	I 0		0.27
6.317	0.00	0.25	0.019	I 0		0.27

PR1NORTHDET									
6.333	0.00	0.25	0.018	I 0					0.26
6.350	0.00	0.24	0.018	I 0					0.26
6.367	0.00	0.24	0.018	I 0					0.25
6.383	0.00	0.23	0.017	I 0					0.25
6.400	0.00	0.23	0.017	I 0					0.24
6.417	0.00	0.22	0.017	I 0					0.24
6.433	0.00	0.22	0.016	I 0					0.23
6.450	0.00	0.22	0.016	I 0					0.23
6.467	0.00	0.21	0.016	I 0					0.23
6.483	0.00	0.21	0.016	I 0					0.22
6.500	0.00	0.20	0.015	I 0					0.22
6.517	0.00	0.20	0.015	IO					0.21
6.533	0.00	0.20	0.015	IO					0.21
6.550	0.00	0.19	0.014	IO					0.21
6.567	0.00	0.19	0.014	IO					0.20
6.583	0.00	0.19	0.014	IO					0.20
6.600	0.00	0.18	0.014	IO					0.19
6.617	0.00	0.18	0.013	IO					0.19
6.633	0.00	0.18	0.013	IO					0.19
6.650	0.00	0.17	0.013	IO					0.18
6.667	0.00	0.17	0.013	IO					0.18
6.683	0.00	0.17	0.012	IO					0.18
6.700	0.00	0.16	0.012	IO					0.17
6.717	0.00	0.16	0.012	IO					0.17
6.733	0.00	0.16	0.012	IO					0.17
6.750	0.00	0.16	0.012	IO					0.16
6.767	0.00	0.15	0.011	IO					0.16
6.783	0.00	0.15	0.011	IO					0.16
6.800	0.00	0.15	0.011	IO					0.16
6.817	0.00	0.14	0.011	IO					0.15
6.833	0.00	0.14	0.011	IO					0.15
6.850	0.00	0.14	0.010	IO					0.15
6.867	0.00	0.14	0.010	IO					0.14
6.883	0.00	0.13	0.010	IO					0.14
6.900	0.00	0.13	0.010	IO					0.14
6.917	0.00	0.13	0.010	IO					0.14
6.933	0.00	0.13	0.009	IO					0.13
6.950	0.00	0.12	0.009	IO					0.13
6.967	0.00	0.12	0.009	IO					0.13
6.983	0.00	0.12	0.009	IO					0.13
7.000	0.00	0.12	0.009	IO					0.13
7.017	0.00	0.12	0.009	IO					0.12
7.033	0.00	0.11	0.008	IO					0.12
7.050	0.00	0.11	0.008	IO					0.12
7.067	0.00	0.11	0.008	IO					0.12
7.083	0.00	0.11	0.008	IO					0.11
7.100	0.00	0.11	0.008	IO					0.11
7.117	0.00	0.10	0.008	IO					0.11
7.133	0.00	0.10	0.008	0					0.11
7.150	0.00	0.10	0.007	0					0.11
7.167	0.00	0.10	0.007	0					0.10
7.183	0.00	0.10	0.007	0					0.10
7.200	0.00	0.09	0.007	0					0.10
7.217	0.00	0.09	0.007	0					0.10
7.233	0.00	0.09	0.007	0					0.10
7.250	0.00	0.09	0.007	0					0.09
7.267	0.00	0.09	0.007	0					0.09
7.283	0.00	0.09	0.006	0					0.09
7.300	0.00	0.08	0.006	0					0.09
7.317	0.00	0.08	0.006	0					0.09
7.333	0.00	0.08	0.006	0					0.09
7.350	0.00	0.08	0.006	0					0.08
7.367	0.00	0.08	0.006	0					0.08

PR1NORTHDET									
7.383	0.00	0.08	0.006	0					0.08
7.400	0.00	0.08	0.006	0					0.08
7.417	0.00	0.07	0.006	0					0.08
7.433	0.00	0.07	0.005	0					0.08
7.450	0.00	0.07	0.005	0					0.08
7.467	0.00	0.07	0.005	0					0.07
7.483	0.00	0.07	0.005	0					0.07
7.500	0.00	0.07	0.005	0					0.07
7.517	0.00	0.07	0.005	0					0.07
7.533	0.00	0.07	0.005	0					0.07
7.550	0.00	0.06	0.005	0					0.07
7.567	0.00	0.06	0.005	0					0.07
7.583	0.00	0.06	0.005	0					0.07
7.600	0.00	0.06	0.004	0					0.06
7.617	0.00	0.06	0.004	0					0.06
7.633	0.00	0.06	0.004	0					0.06
7.650	0.00	0.06	0.004	0					0.06
7.667	0.00	0.06	0.004	0					0.06
7.683	0.00	0.06	0.004	0					0.06
7.700	0.00	0.05	0.004	0					0.06
7.717	0.00	0.05	0.004	0					0.06
7.733	0.00	0.05	0.004	0					0.06
7.750	0.00	0.05	0.004	0					0.05
7.767	0.00	0.05	0.004	0					0.05
7.783	0.00	0.05	0.004	0					0.05
7.800	0.00	0.05	0.004	0					0.05
7.817	0.00	0.05	0.004	0					0.05
7.833	0.00	0.05	0.003	0					0.05
7.850	0.00	0.05	0.003	0					0.05
7.867	0.00	0.04	0.003	0					0.05
7.883	0.00	0.04	0.003	0					0.05
7.900	0.00	0.04	0.003	0					0.05
7.917	0.00	0.04	0.003	0					0.05
7.933	0.00	0.04	0.003	0					0.04
7.950	0.00	0.04	0.003	0					0.04
7.967	0.00	0.04	0.003	0					0.04
7.983	0.00	0.04	0.003	0					0.04
8.000	0.00	0.04	0.003	0					0.04
8.017	0.00	0.04	0.003	0					0.04
8.033	0.00	0.04	0.003	0					0.04
8.050	0.00	0.04	0.003	0					0.04
8.067	0.00	0.04	0.003	0					0.04
8.083	0.00	0.04	0.003	0					0.04
8.100	0.00	0.03	0.003	0					0.04
8.117	0.00	0.03	0.003	0					0.04
8.133	0.00	0.03	0.002	0					0.04
8.150	0.00	0.03	0.002	0					0.03
8.167	0.00	0.03	0.002	0					0.03
8.183	0.00	0.03	0.002	0					0.03
8.200	0.00	0.03	0.002	0					0.03
8.217	0.00	0.03	0.002	0					0.03
8.233	0.00	0.03	0.002	0					0.03
8.250	0.00	0.03	0.002	0					0.03
8.267	0.00	0.03	0.002	0					0.03
8.283	0.00	0.03	0.002	0					0.03
8.300	0.00	0.03	0.002	0					0.03
8.317	0.00	0.03	0.002	0					0.03
8.333	0.00	0.03	0.002	0					0.03
8.350	0.00	0.03	0.002	0					0.03
8.367	0.00	0.03	0.002	0					0.03
8.383	0.00	0.03	0.002	0					0.03
8.400	0.00	0.02	0.002	0					0.03
8.417	0.00	0.02	0.002	0					0.03

PR1NORTHDET									
8.433	0.00	0.02	0.002	0					0.03
8.450	0.00	0.02	0.002	0					0.03
8.467	0.00	0.02	0.002	0					0.02
8.483	0.00	0.02	0.002	0					0.02
8.500	0.00	0.02	0.002	0					0.02
8.517	0.00	0.02	0.002	0					0.02
8.533	0.00	0.02	0.002	0					0.02
8.550	0.00	0.02	0.002	0					0.02
8.567	0.00	0.02	0.002	0					0.02
8.583	0.00	0.02	0.002	0					0.02
8.600	0.00	0.02	0.001	0					0.02
8.617	0.00	0.02	0.001	0					0.02
8.633	0.00	0.02	0.001	0					0.02
8.650	0.00	0.02	0.001	0					0.02
8.667	0.00	0.02	0.001	0					0.02
8.683	0.00	0.02	0.001	0					0.02
8.700	0.00	0.02	0.001	0					0.02
8.717	0.00	0.02	0.001	0					0.02
8.733	0.00	0.02	0.001	0					0.02
8.750	0.00	0.02	0.001	0					0.02
8.767	0.00	0.02	0.001	0					0.02
8.783	0.00	0.02	0.001	0					0.02
8.800	0.00	0.02	0.001	0					0.02
8.817	0.00	0.02	0.001	0					0.02
8.833	0.00	0.02	0.001	0					0.02
8.850	0.00	0.02	0.001	0					0.02
8.867	0.00	0.01	0.001	0					0.02
8.883	0.00	0.01	0.001	0					0.02
8.900	0.00	0.01	0.001	0					0.02
8.917	0.00	0.01	0.001	0					0.01
8.933	0.00	0.01	0.001	0					0.01
8.950	0.00	0.01	0.001	0					0.01
8.967	0.00	0.01	0.001	0					0.01
8.983	0.00	0.01	0.001	0					0.01
9.000	0.00	0.01	0.001	0					0.01
9.017	0.00	0.01	0.001	0					0.01
9.033	0.00	0.01	0.001	0					0.01
9.050	0.00	0.01	0.001	0					0.01
9.067	0.00	0.01	0.001	0					0.01
9.083	0.00	0.01	0.001	0					0.01
9.100	0.00	0.01	0.001	0					0.01
9.117	0.00	0.01	0.001	0					0.01
9.133	0.00	0.01	0.001	0					0.01
9.150	0.00	0.01	0.001	0					0.01
9.167	0.00	0.01	0.001	0					0.01
9.183	0.00	0.01	0.001	0					0.01
9.200	0.00	0.01	0.001	0					0.01
9.217	0.00	0.01	0.001	0					0.01
9.233	0.00	0.01	0.001	0					0.01
9.250	0.00	0.01	0.001	0					0.01
9.267	0.00	0.01	0.001	0					0.01
9.283	0.00	0.01	0.001	0					0.01
9.300	0.00	0.01	0.001	0					0.01
9.317	0.00	0.01	0.001	0					0.01
9.333	0.00	0.01	0.001	0					0.01
9.350	0.00	0.01	0.001	0					0.01
9.367	0.00	0.01	0.001	0					0.01
9.383	0.00	0.01	0.001	0					0.01
9.400	0.00	0.01	0.001	0					0.01
9.417	0.00	0.01	0.001	0					0.01
9.433	0.00	0.01	0.001	0					0.01
9.450	0.00	0.01	0.001	0					0.01
9.467	0.00	0.01	0.001	0					0.01

PR1NORTHDET									
9.483	0.00	0.01	0.001	0					0.01
9.500	0.00	0.01	0.001	0					0.01
9.517	0.00	0.01	0.001	0					0.01
9.533	0.00	0.01	0.001	0					0.01
9.550	0.00	0.01	0.001	0					0.01
9.567	0.00	0.01	0.001	0					0.01
9.583	0.00	0.01	0.000	0					0.01
9.600	0.00	0.01	0.000	0					0.01
9.617	0.00	0.01	0.000	0					0.01
9.633	0.00	0.01	0.000	0					0.01
9.650	0.00	0.01	0.000	0					0.01
9.667	0.00	0.01	0.000	0					0.01
9.683	0.00	0.01	0.000	0					0.01
9.700	0.00	0.01	0.000	0					0.01
9.717	0.00	0.01	0.000	0					0.01
9.733	0.00	0.01	0.000	0					0.01
9.750	0.00	0.01	0.000	0					0.01
9.767	0.00	0.01	0.000	0					0.01
9.783	0.00	0.01	0.000	0					0.01
9.800	0.00	0.01	0.000	0					0.01
9.817	0.00	0.01	0.000	0					0.01
9.833	0.00	0.01	0.000	0					0.01
9.850	0.00	0.00	0.000	0					0.01
9.867	0.00	0.00	0.000	0					0.01
9.883	0.00	0.00	0.000	0					0.01
9.900	0.00	0.00	0.000	0					0.01
9.917	0.00	0.00	0.000	0					0.00
9.933	0.00	0.00	0.000	0					0.00
9.950	0.00	0.00	0.000	0					0.00
9.967	0.00	0.00	0.000	0					0.00
9.983	0.00	0.00	0.000	0					0.00
10.000	0.00	0.00	0.000	0					0.00
10.017	0.00	0.00	0.000	0					0.00
10.033	0.00	0.00	0.000	0					0.00
10.050	0.00	0.00	0.000	0					0.00
10.067	0.00	0.00	0.000	0					0.00
10.083	0.00	0.00	0.000	0					0.00
10.100	0.00	0.00	0.000	0					0.00
10.117	0.00	0.00	0.000	0					0.00
10.133	0.00	0.00	0.000	0					0.00
10.150	0.00	0.00	0.000	0					0.00
10.167	0.00	0.00	0.000	0					0.00
10.183	0.00	0.00	0.000	0					0.00
10.200	0.00	0.00	0.000	0					0.00
10.217	0.00	0.00	0.000	0					0.00
10.233	0.00	0.00	0.000	0					0.00
10.250	0.00	0.00	0.000	0					0.00
10.267	0.00	0.00	0.000	0					0.00
10.283	0.00	0.00	0.000	0					0.00
10.300	0.00	0.00	0.000	0					0.00
10.317	0.00	0.00	0.000	0					0.00
10.333	0.00	0.00	0.000	0					0.00
10.350	0.00	0.00	0.000	0					0.00
10.367	0.00	0.00	0.000	0					0.00
10.383	0.00	0.00	0.000	0					0.00
10.400	0.00	0.00	0.000	0					0.00
10.417	0.00	0.00	0.000	0					0.00
10.433	0.00	0.00	0.000	0					0.00
10.450	0.00	0.00	0.000	0					0.00
10.467	0.00	0.00	0.000	0					0.00
10.483	0.00	0.00	0.000	0					0.00
10.500	0.00	0.00	0.000	0					0.00
10.517	0.00	0.00	0.000	0					0.00

	PR1NORTHDET					
10.533	0.00	0.00	0.000	0		0.00
10.550	0.00	0.00	0.000	0		0.00
10.567	0.00	0.00	0.000	0		0.00
10.583	0.00	0.00	0.000	0		0.00
10.600	0.00	0.00	0.000	0		0.00
10.617	0.00	0.00	0.000	0		0.00
10.633	0.00	0.00	0.000	0		0.00
10.650	0.00	0.00	0.000	0		0.00
10.667	0.00	0.00	0.000	0		0.00
10.683	0.00	0.00	0.000	0		0.00
10.700	0.00	0.00	0.000	0		0.00
10.717	0.00	0.00	0.000	0		0.00
10.733	0.00	0.00	0.000	0		0.00
10.750	0.00	0.00	0.000	0		0.00
10.767	0.00	0.00	0.000	0		0.00
10.783	0.00	0.00	0.000	0		0.00
10.800	0.00	0.00	0.000	0		0.00
10.817	0.00	0.00	0.000	0		0.00
10.833	0.00	0.00	0.000	0		0.00
10.850	0.00	0.00	0.000	0		0.00
10.867	0.00	0.00	0.000	0		0.00
10.883	0.00	0.00	0.000	0		0.00
10.900	0.00	0.00	0.000	0		0.00
10.917	0.00	0.00	0.000	0		0.00
10.933	0.00	0.00	0.000	0		0.00
10.950	0.00	0.00	0.000	0		0.00
10.967	0.00	0.00	0.000	0		0.00
10.983	0.00	0.00	0.000	0		0.00
11.000	0.00	0.00	0.000	0		0.00
11.017	0.00	0.00	0.000	0		0.00
11.033	0.00	0.00	0.000	0		0.00
11.050	0.00	0.00	0.000	0		0.00
11.067	0.00	0.00	0.000	0		0.00
11.083	0.00	0.00	0.000	0		0.00
11.100	0.00	0.00	0.000	0		0.00
11.117	0.00	0.00	0.000	0		0.00
11.133	0.00	0.00	0.000	0		0.00
11.150	0.00	0.00	0.000	0		0.00
11.167	0.00	0.00	0.000	0		0.00
11.183	0.00	0.00	0.000	0		0.00
11.200	0.00	0.00	0.000	0		0.00
11.217	0.00	0.00	0.000	0		0.00
11.233	0.00	0.00	0.000	0		0.00
11.250	0.00	0.00	0.000	0		0.00
11.267	0.00	0.00	0.000	0		0.00
11.283	0.00	0.00	0.000	0		0.00
11.300	0.00	0.00	0.000	0		0.00

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*****HYDROGRAPH DATA*****
      Number of intervals =   678
      Time interval =     1.0 (Min.)
      Maximum/Peak flow rate =       0.737 (CFS)
      Total volume =       0.166 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS)      0.000      0.000      0.000      0.000      0.000
      Vol (Ac.Ft)      0.000      0.000      0.000      0.000      0.000
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PR1NORTHBASIN

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.870 given for subarea
Rainfall intensity (I) = 2.947(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 20.74 min. Rain intensity = 2.95(In/Hr)
Total area = 1.280(Ac.) Total runoff = 0.737(CFS)

+++++
Process from Point/Station 102.000 to Point/Station 104.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 380.000(Ft.)
Downstream point/station elevation = 374.960(Ft.)
Pipe length = 185.00(Ft.) Slope = 0.0272 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.737(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 0.737(CFS)
Normal flow depth in pipe = 2.87(In.)
Flow top width inside pipe = 10.24(In.)
Critical Depth = 4.29(In.)
Pipe flow velocity = 5.11(Ft/s)
Travel time through pipe = 0.60 min.
Time of concentration (TC) = 21.34 min.
End of computations, total study area = 1.280 (Ac.)

PR12NORTHBASIN

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 109.000 to Point/Station 104.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1027.000(Ft.)
Highest elevation = 450.000(Ft.)
Lowest elevation = 374.960(Ft.)
Elevation difference = 75.040(Ft.) Slope = 7.307 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 7.31 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.96 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (7.307^{(1/3)})] = 6.96$
The initial area total distance of 1027.00 (Ft.) entered leaves a
remaining distance of 927.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 4.12 minutes
for a distance of 927.00 (Ft.) and a slope of 7.31 %
with an elevation difference of 67.74(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 4.118 Minutes
 $Tt = [(11.9 * 0.1756^3) / (67.74)]^{.385} = 4.12$
Total initial area Ti = 6.96 minutes from Figure 3-3 formula plus
4.12 minutes from the Figure 3-4 formula = 11.08 minutes
Rainfall intensity (I) = 4.417(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350

PR12NORTHBASIN

Subarea runoff = 6.045(CFS)
 Total initial stream area = 3.910(Ac.)

+++++
 Process from Point/Station 109.000 to Point/Station 104.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 3.910(Ac.)
 Runoff from this stream = 6.045(CFS)
 Time of concentration = 11.08 min.
 Rainfall intensity = 4.417(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	6.045	11.08	4.417

Qmax(1) = 1.000 * 1.000 * 6.045) + = 6.045

Total of 1 main streams to confluence:

Flow rates before confluence point:
 6.045

Maximum flow rates at confluence using above data:
 6.045

Area of streams before confluence:
 3.910

Results of confluence:

Total flow rate = 6.045(CFS)
 Time of concentration = 11.075 min.
 Effective stream area after confluence = 3.910(Ac.)

+++++
 Process from Point/Station 103.000 to Point/Station 104.000
 **** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000

[UNDISTURBED NATURAL TERRAIN]
 (Permanent Open Space)

Impervious value, Ai = 0.000

Sub-Area C Value = 0.350

Initial subarea total flow distance = 309.000(Ft.)

Highest elevation = 412.000(Ft.)

Lowest elevation = 374.960(Ft.)

Elevation difference = 37.040(Ft.) Slope = 11.987 %

INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:

The maximum overland flow distance is 100.00 (Ft)

for the top area slope value of 11.99 %, in a development type of
 Permanent Open Space

In Accordance With Figure 3-3

Initial Area Time of Concentration = 5.90 minutes

TC = $[1.8 * (1.1 - C) * \text{distance}(\text{Ft.})^{.5} / (\% \text{ slope}^{(1/3)})]$

TC = $[1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (11.987^{(1/3)})] = 5.90$

PR12NORTHBASIN

The initial area total distance of 309.00 (Ft.) entered leaves a remaining distance of 209.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 1.08 minutes for a distance of 209.00 (Ft.) and a slope of 11.99 %
 with an elevation difference of 25.05(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3 / (\text{elevation change}(\text{Ft.}))]^{\wedge}.385 * 60(\text{min/hr})$
 $= 1.081 \text{ Minutes}$
 $Tt = [(11.9 * 0.0396^3) / (25.05)]^{\wedge}.385 = 1.08$
 Total initial area $Ti = 5.90$ minutes from Figure 3-3 formula plus
 1.08 minutes from the Figure 3-4 formula = 6.98 minutes
 Rainfall intensity (I) = 5.949(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area ($Q=KCIA$) is $C = 0.350$
 Subarea runoff = 0.833(CFS)
 Total initial stream area = 0.400(Ac.)

 Process from Point/Station 103.000 to Point/Station 104.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 2
 Stream flow area = 0.400(Ac.)
 Runoff from this stream = 0.833(CFS)
 Time of concentration = 6.98 min.
 Rainfall intensity = 5.949(In/Hr)
 Program is now starting with Main Stream No. 3

 Process from Point/Station 203.000 to Point/Station 204.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
 Rainfall intensity (I) = 3.555(In/Hr) for a 100.0 year storm
 User specified values are as follows:
 $TC = 15.51 \text{ min.}$ Rain intensity = 3.55(In/Hr)
 Total area = 1.480(Ac.) Total runoff = 2.278(CFS)

 Process from Point/Station 204.000 to Point/Station 104.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 391.250(Ft.)
 Downstream point elevation = 374.960(Ft.)
 Channel length thru subarea = 759.000(Ft.)
 Channel base width = 0.000(Ft.)
 Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 1.000
 Estimated mean flow rate at midpoint of channel = 2.722(CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 1.000(Ft.)
 Flow(q) thru subarea = 2.722(CFS)
 Depth of flow = 0.692(Ft.), Average velocity = 5.679(Ft/s)
 Channel flow top width = 1.385(Ft.)
 Flow Velocity = 5.68(Ft/s)
 Travel time = 2.23 min.
 Time of concentration = 17.74 min.
 Critical depth = 0.859(Ft.)
 Adding area flow to channel
 Rainfall intensity (I) = 3.260(In/Hr) for a 100.0 year storm
 Decimal fraction soil group A = 0.000

PR12NORTHBASIN

Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 [UNDISTURBED NATURAL TERRAIN]
 (Permanent Open Space)
 Impervious value, Ai = 0.000
 Sub-Area C Value = 0.350
 Rainfall intensity = 3.260(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for total area
 (Q=KCIA) is C = 0.423 CA = 0.943
 Subarea runoff = 0.797(CFS) for 0.750(Ac.)
 Total runoff = 3.075(CFS) Total area = 2.230(Ac.)
 Depth of flow = 0.725(Ft.), Average velocity = 5.855(Ft/s)
 Critical depth = 0.898(Ft.)

 Process from Point/Station 204.000 to Point/Station 104.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 3
 Stream flow area = 2.230(Ac.)
 Runoff from this stream = 3.075(CFS)
 Time of concentration = 17.74 min.
 Rainfall intensity = 3.260(In/Hr)
 Program is now starting with Main Stream No. 4

 Process from Point/Station 102.000 to Point/Station 104.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.870 given for subarea
 Rainfall intensity (I) = 2.893(In/Hr) for a 100.0 year storm
 User specified values are as follows:
 TC = 21.34 min. Rain intensity = 2.89(In/Hr)
 Total area = 1.280(Ac.) Total runoff = 0.737(CFS)

 Process from Point/Station 102.000 to Point/Station 104.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 4
 Stream flow area = 1.280(Ac.)
 Runoff from this stream = 0.737(CFS)
 Time of concentration = 21.34 min.
 Rainfall intensity = 2.893(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	6.045	11.08	4.417
2	0.833	6.98	5.949
3	3.075	17.74	3.260
4	0.737	21.34	2.893

Qmax(1) =
 1.000 * 1.000 * 6.045) +
 0.742 * 1.000 * 0.833) +

PR12NORTHBASIN

	1.000 *	0.624 *	3.075) +	
Qmax(2) =	1.000 *	0.519 *	0.737) + =	8.966
	1.000 *	0.630 *	6.045) +	
	1.000 *	1.000 *	0.833) +	
	1.000 *	0.394 *	3.075) +	
Qmax(3) =	1.000 *	0.327 *	0.737) + =	6.093
	0.738 *	1.000 *	6.045) +	
	0.548 *	1.000 *	0.833) +	
	1.000 *	1.000 *	3.075) +	
Qmax(4) =	1.000 *	0.831 *	0.737) + =	8.605
	0.655 *	1.000 *	6.045) +	
	0.486 *	1.000 *	0.833) +	
	0.888 *	1.000 *	3.075) +	
	1.000 *	1.000 *	0.737) + =	7.831

Total of 4 main streams to confluence:

Flow rates before confluence point:

6.045	0.833	3.075	0.737
Maximum flow rates at confluence using above data:			
8.966	6.093	8.605	7.831
Area of streams before confluence:			
3.910	0.400	2.230	1.280

Results of confluence:

Total flow rate = 8.966(CFS)

Time of concentration = 11.075 min.

Effective stream area after confluence = 7.820(Ac.)

+++++
 Process from Point/Station 104.000 to Point/Station 108.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Depth of flow = 0.371(Ft.), Average velocity = 4.353(Ft/s)
 ***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.50
2	10.00	0.00
3	15.00	0.50

Manning's 'N' friction factor = 0.035

Sub-Channel flow =	8.966(CFS)
flow top width =	11.117(Ft.)
velocity=	4.353(Ft/s)
area =	2.060(Sq.Ft)
Froude number =	1.782

Upstream point elevation = 374.960(Ft.)

Downstream point elevation = 348.000(Ft.)

Flow length = 270.000(Ft.)

Travel time = 1.03 min.

Time of concentration = 12.11 min.

Depth of flow = 0.371(Ft.)

Average velocity = 4.353(Ft/s)

Total irregular channel flow = 8.966(CFS)

Irregular channel normal depth above invert elev. = 0.371(Ft.)

Average velocity of channel(s) = 4.353(Ft/s)

PR12NORTHBASIN
End of computations, total study area = 7.820 (Ac.)

PR12NORTHBASIN2

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 110.000 to Point/Station 108.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 360.000(Ft.)
Highest elevation = 386.760(Ft.)
Lowest elevation = 348.000(Ft.)
Elevation difference = 38.760(Ft.) Slope = 10.767 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 10.77 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.11 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (10.767^{(1/3)})] = 6.11$
The initial area total distance of 360.00 (Ft.) entered leaves a
remaining distance of 260.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.33 minutes
for a distance of 260.00 (Ft.) and a slope of 10.77 %
with an elevation difference of 27.99(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 1.333 Minutes
 $Tt = [(11.9 * 0.0492^3) / (27.99)]^{.385} = 1.33$
Total initial area Ti = 6.11 minutes from Figure 3-3 formula plus
1.33 minutes from the Figure 3-4 formula = 7.45 minutes
Rainfall intensity (I) = 5.706(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350

PR12NORTHBASIN2

Subarea runoff = 2.097(CFS)
 Total initial stream area = 1.050(Ac.)

+++++
 Process from Point/Station 110.000 to Point/Station 108.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 1
 Stream flow area = 1.050(Ac.)
 Runoff from this stream = 2.097(CFS)
 Time of concentration = 7.45 min.
 Rainfall intensity = 5.706(In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 104.000 to Point/Station 108.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.870 given for subarea
 Rainfall intensity (I) = 4.170(In/Hr) for a 100.0 year storm
 User specified values are as follows:
 TC = 12.11 min. Rain intensity = 4.17(In/Hr)
 Total area = 7.820(Ac.) Total runoff = 8.966(CFS)

+++++
 Process from Point/Station 104.000 to Point/Station 108.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 2
 Stream flow area = 7.820(Ac.)
 Runoff from this stream = 8.966(CFS)
 Time of concentration = 12.11 min.
 Rainfall intensity = 4.170(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.097	7.45	5.706
2	8.966	12.11	4.170
Qmax(1) =			
	1.000 *	1.000 *	2.097) +
	1.000 *	0.615 *	8.966) + = 7.610
Qmax(2) =			
	0.731 *	1.000 *	2.097) +
	1.000 *	1.000 *	8.966) + = 10.498

Total of 2 main streams to confluence:
 Flow rates before confluence point:
 2.097 8.966
 Maximum flow rates at confluence using above data:
 7.610 10.498
 Area of streams before confluence:
 1.050 7.820

Results of confluence:

PR12NORTHBASIN2
 Total flow rate = 10.498(CFS)
 Time of concentration = 12.110 min.
 Effective stream area after confluence = 8.870(Ac.)
 End of computations, total study area = 8.870 (Ac.)

PR12NORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 101.000 to Point/Station 104.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1027.000(Ft.)
Highest elevation = 450.000(Ft.)
Lowest elevation = 374.960(Ft.)
Elevation difference = 75.040(Ft.) Slope = 7.307 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 7.31 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.96 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (7.307^{(1/3)})] = 6.96$
The initial area total distance of 1027.00 (Ft.) entered leaves a
remaining distance of 927.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 4.12 minutes
for a distance of 927.00 (Ft.) and a slope of 7.31 %
with an elevation difference of 67.74(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 4.118 Minutes
 $Tt = [(11.9 * 0.1756^3) / (67.74)]^{.385} = 4.12$
Total initial area Ti = 6.96 minutes from Figure 3-3 formula plus
4.12 minutes from the Figure 3-4 formula = 11.08 minutes
Rainfall intensity (I) = 4.417(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350

PR12NORTH
Subarea runoff = 6.045(CFS)
Total initial stream area = 3.910(Ac.)

+++++
Process from Point/Station 101.000 to Point/Station 104.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 3.910(Ac.)
Runoff from this stream = 6.045(CFS)
Time of concentration = 11.08 min.
Rainfall intensity = 4.417(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 103.000 to Point/Station 104.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 309.000(Ft.)
Highest elevation = 412.000(Ft.)
Lowest elevation = 374.960(Ft.)
Elevation difference = 37.040(Ft.) Slope = 11.987 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 11.99 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 5.90 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{1.5}] / (Slope^{1/3})$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{1.5})] / (11.987^{1/3}) = 5.90$
The initial area total distance of 309.00 (Ft.) entered leaves a
remaining distance of 209.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.08 minutes
for a distance of 209.00 (Ft.) and a slope of 11.99 %
with an elevation difference of 25.05(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation\ change(Ft.))^{.385} * 60(min/hr)$
= 1.081 Minutes
 $Tt = [(11.9 * 0.0396^3) / (25.05)]^{.385} = 1.08$
Total initial area Ti = 5.90 minutes from Figure 3-3 formula plus
1.08 minutes from the Figure 3-4 formula = 6.98 minutes
Rainfall intensity (I) = 5.949(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 0.833(CFS)
Total initial stream area = 0.400(Ac.)

+++++
Process from Point/Station 103.000 to Point/Station 104.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2

PR12NORTH
Stream flow area = 0.400(Ac.)
Runoff from this stream = 0.833(CFS)
Time of concentration = 6.98 min.
Rainfall intensity = 5.949(In/Hr)
Program is now starting with Main Stream No. 3

+++++
Process from Point/Station 105.000 to Point/Station 204.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
Rainfall intensity (I) = 4.087(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 12.49 min. Rain intensity = 4.09(In/Hr)
Total area = 1.480(Ac.) Total runoff = 2.686(CFS)

+++++
Process from Point/Station 204.000 to Point/Station 104.000
**** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 391.250(Ft.)
Downstream point elevation = 374.960(Ft.)
Channel length thru subarea = 759.000(Ft.)
Channel base width = 0.000(Ft.)
Slope or 'Z' of left channel bank = 1.000
Slope or 'Z' of right channel bank = 1.000
Estimated mean flow rate at midpoint of channel = 3.119(CFS)
Manning's 'N' = 0.015
Maximum depth of channel = 1.000(Ft.)
Flow(q) thru subarea = 3.119(CFS)
Depth of flow = 0.729(Ft.), Average velocity = 5.876(Ft/s)
Channel flow top width = 1.457(Ft.)
Flow Velocity = 5.88(Ft/s)
Travel time = 2.15 min.
Time of concentration = 14.64 min.
Critical depth = 0.906(Ft.)
Adding area flow to channel
Rainfall intensity (I) = 3.689(In/Hr) for a 100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Rainfall intensity = 3.689(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.423 CA = 0.943
Subarea runoff = 0.794(CFS) for 0.750(Ac.)
Total runoff = 3.480(CFS) Total area = 2.230(Ac.)
Depth of flow = 0.759(Ft.), Average velocity = 6.039(Ft/s)
Critical depth = 0.945(Ft.)

+++++
Process from Point/Station 204.000 to Point/Station 104.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 3

PR12NORTH
Stream flow area = 2.230(Ac.)
Runoff from this stream = 3.480(CFS)
Time of concentration = 14.64 min.
Rainfall intensity = 3.689(In/Hr)
Program is now starting with Main Stream No. 4

+++++
Process from Point/Station 102.000 to Point/Station 104.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.870 given for subarea
Rainfall intensity (I) = 4.390(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 11.18 min. Rain intensity = 4.39(In/Hr)
Total area = 1.280(Ac.) Total runoff = 3.248(CFS)

+++++
Process from Point/Station 102.000 to Point/Station 104.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 4
Stream flow area = 1.280(Ac.)
Runoff from this stream = 3.248(CFS)
Time of concentration = 11.18 min.
Rainfall intensity = 4.390(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	6.045	11.08	4.417
2	0.833	6.98	5.949
3	3.480	14.64	3.689
4	3.248	11.18	4.390

Qmax(1) =

1.000 *	1.000 *	6.045)	+
0.742 *	1.000 *	0.833)	+
1.000 *	0.756 *	3.480)	+
1.000 *	0.991 *	3.248)	+ = 12.512

Qmax(2) =

1.000 *	0.630 *	6.045)	+
1.000 *	1.000 *	0.833)	+
1.000 *	0.477 *	3.480)	+
1.000 *	0.624 *	3.248)	+ = 8.329

Qmax(3) =

0.835 *	1.000 *	6.045)	+
0.620 *	1.000 *	0.833)	+
1.000 *	1.000 *	3.480)	+
0.840 *	1.000 *	3.248)	+ = 11.774

Qmax(4) =

0.994 *	1.000 *	6.045)	+
0.738 *	1.000 *	0.833)	+
1.000 *	0.764 *	3.480)	+
1.000 *	1.000 *	3.248)	+ = 12.527

Total of 4 main streams to confluence:

Flow rates before confluence point:

6.045 0.833 3.480 3.248

Maximum flow rates at confluence using above data:

	12.512	8.329	PR12NORTH 11.774	12.527
Area of streams before confluence:				
	3.910	0.400	2.230	1.280

Results of confluence:

Total flow rate = 12.527(CFS)
Time of concentration = 11.180 min.
Effective stream area after confluence = 7.820(Ac.)

+++++
Process from Point/Station 104.000 to Point/Station 108.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 14.433(CFS)
Depth of flow = 0.443(Ft.), Average velocity = 4.903(Ft/s)
***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.50
2	10.00	0.00
3	15.00	0.50

Manning's 'N' friction factor = 0.035

Sub-Channel flow = 14.433(CFS)
' ' flow top width = 13.290(Ft.)
' ' velocity = 4.903(Ft/s)
' ' area = 2.944(Sq.Ft)
' ' Froude number = 1.836

Upstream point elevation = 374.960(Ft.)
Downstream point elevation = 348.000(Ft.)
Flow length = 270.000(Ft.)
Travel time = 0.92 min.
Time of concentration = 12.10 min.
Depth of flow = 0.443(Ft.)
Average velocity = 4.903(Ft/s)
Total irregular channel flow = 14.433(CFS)
Irregular channel normal depth above invert elev. = 0.443(Ft.)
Average velocity of channel(s) = 4.903(Ft/s)
Adding area flow to channel
Rainfall intensity (I) = 4.172(In/Hr) for a 100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Rainfall intensity = 4.172(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.443 CA = 3.933
Subarea runoff = 3.882(CFS) for 1.050(Ac.)
Total runoff = 16.410(CFS) Total area = 8.870(Ac.)
Depth of flow = 0.465(Ft.), Average velocity = 5.063(Ft/s)
End of computations, total study area = 8.870 (Ac.)

PR2NORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 400.000(Ft.)
Highest elevation = 403.480(Ft.)
Lowest elevation = 397.000(Ft.)
Elevation difference = 6.480(Ft.) Slope = 1.620 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.62 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 9.04 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5}] / (\% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4600) * (85.000^{.5})] / (1.620^{(1/3)}) = 9.04$
The initial area total distance of 400.00 (Ft.) entered leaves a
remaining distance of 315.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 3.20 minutes
for a distance of 315.00 (Ft.) and a slope of 1.62 %
with an elevation difference of 5.10(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation change(Ft.))^{.385} * 60(min/hr)$
= 3.204 Minutes
 $Tt = [(11.9 * 0.0597^3) / (5.10)]^{.385} = 3.20$
Total initial area Ti = 9.04 minutes from Figure 3-3 formula plus
3.20 minutes from the Figure 3-4 formula = 12.25 minutes
Rainfall intensity (I) = 4.140(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.460

PR2NORTH
Subarea runoff = 2.266(CFS)
Total initial stream area = 1.190(Ac.)

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 1.190(Ac.)
Runoff from this stream = 2.266(CFS)
Time of concentration = 12.25 min.
Rainfall intensity = 4.140(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 304.000 to Point/Station 203.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 126.000(Ft.)
Highest elevation = 408.390(Ft.)
Lowest elevation = 397.000(Ft.)
Elevation difference = 11.390(Ft.) Slope = 9.040 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 9.04 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.48 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{1.5}] / (\% slope^{1/3})$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{1.5})] / (9.040^{1/3}) = 6.48$
The initial area total distance of 126.00 (Ft.) entered leaves a
remaining distance of 26.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 0.24 minutes
for a distance of 26.00 (Ft.) and a slope of 9.04 %
with an elevation difference of 2.35(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation change(Ft.))^{.385} * 60(min/hr)$
= 0.242 Minutes
 $Tt = [(11.9 * 0.0049^3) / (2.35)]^{.385} = 0.24$
Total initial area Ti = 6.48 minutes from Figure 3-3 formula plus
0.24 minutes from the Figure 3-4 formula = 6.72 minutes
Rainfall intensity (I) = 6.095(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 0.619(CFS)
Total initial stream area = 0.290(Ac.)

+++++
Process from Point/Station 304.000 to Point/Station 203.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2

PR2NORTH

Stream flow area = 0.290(Ac.)
 Runoff from this stream = 0.619(CFS)
 Time of concentration = 6.72 min.
 Rainfall intensity = 6.095(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.266	12.25	4.140
2	0.619	6.72	6.095
Qmax(1) =			
	1.000 *	1.000 *	2.266) +
	0.679 *	1.000 *	0.619) + = 2.686
Qmax(2) =			
	1.000 *	0.549 *	2.266) +
	1.000 *	1.000 *	0.619) + = 1.863

Total of 2 main streams to confluence:
 Flow rates before confluence point:
 2.266 0.619
 Maximum flow rates at confluence using above data:
 2.686 1.863
 Area of streams before confluence:
 1.190 0.290

Results of confluence:
 Total flow rate = 2.686(CFS)
 Time of concentration = 12.247 min.
 Effective stream area after confluence = 1.480(Ac.)

 Process from Point/Station 203.000 to Point/Station 204.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 394.000(Ft.)
 Downstream point/station elevation = 391.320(Ft.)
 Pipe length = 105.00(Ft.) Slope = 0.0255 Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 2.686(CFS)
 Given pipe size = 12.00(In.)
 Calculated individual pipe flow = 2.686(CFS)
 Normal flow depth in pipe = 5.80(In.)
 Flow top width inside pipe = 11.99(In.)
 Critical Depth = 8.43(In.)
 Pipe flow velocity = 7.14(Ft/s)
 Travel time through pipe = 0.25 min.
 Time of concentration (TC) = 12.49 min.
 End of computations, total study area = 1.480 (Ac.)

PR1NORTHDET

Detention Design

Pipe:

diameter 11 inches 0.92 ft
coefficient 0.013

$$Q = C_o A_o \sqrt{2g(H_o)} \quad (6-12)$$

where ...

Q = orifice flow discharge (ft³/s);
 C_o = orifice discharge coefficient;
 A_o = cross-sectional area of flow through the orifice (ft²);
 g = gravitational acceleration (32.2 ft/s²);
 H_o = effective head above orifice (ft); and

San Diego County Drainage Design Manual
July 2005

Page 6-11

C_o = 0.60 from Table 6.1 County Drainage Design Manual
 A_o = 0.66 sf
 g = 32.20 sf/sec
 C = 2.90

Stage	Depth (ft)	Effective Head (Ho)	Volume (cf)	Area (Ac.ft)	Orifice Flow (cfs)
397.00	0.00	0.00	0	0.000	0.00
397.50	0.50	0.04	639	0.015	0.65
398.00	1.00	0.54	998	0.023	2.34

Hydrology Parameters

Before Detention
Q= 2.530 cfs
A= 1.480 Acre
Tc= 13.43 min.
C= 0.460
I= 4.700 in/hr

After Detention
 Δt = 3.00 min.
Q= 2.176 cfs
A= 1.480 Acre
Tc= 16.43 min.

PR2NORTH2

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 400.000(Ft.)
Highest elevation = 403.480(Ft.)
Lowest elevation = 397.000(Ft.)
Elevation difference = 6.480(Ft.) Slope = 1.620 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.62 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 9.04 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4600) * (85.000^{.5}) / (1.620^{(1/3)})] = 9.04$
The initial area total distance of 400.00 (Ft.) entered leaves a
remaining distance of 315.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 3.20 minutes
for a distance of 315.00 (Ft.) and a slope of 1.62 %
with an elevation difference of 5.10(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 3.204 Minutes
 $Tt = [(11.9 * 0.0597^3) / (5.10)]^{.385} = 3.20$
Total initial area Ti = 9.04 minutes from Figure 3-3 formula plus
3.20 minutes from the Figure 3-4 formula = 12.25 minutes
Rainfall intensity (I) = 4.140(In/Hr) for a 100.0 year storm

PR2NORTH2

Effective runoff coefficient used for area (Q=KCIA) is C = 0.460
 Subarea runoff = 2.266(CFS)
 Total initial stream area = 1.190(Ac.)

 Process from Point/Station 201.000 to Point/Station 202.000
 ***** CONFLUENCE OF MAIN STREAMS *****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 1.190(Ac.)
 Runoff from this stream = 2.266(CFS)
 Time of concentration = 12.25 min.
 Rainfall intensity = 4.140(In/Hr)
 Program is now starting with Main Stream No. 2

 Process from Point/Station 304.000 to Point/Station 203.000
 ***** INITIAL AREA EVALUATION *****

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 [UNDISTURBED NATURAL TERRAIN]
 (Permanent Open Space)
 Impervious value, Ai = 0.000
 Sub-Area C Value = 0.350
 Initial subarea total flow distance = 126.000(Ft.)
 Highest elevation = 408.390(Ft.)
 Lowest elevation = 397.000(Ft.)
 Elevation difference = 11.390(Ft.) Slope = 9.040 %
 INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
 The maximum overland flow distance is 100.00 (Ft)
 for the top area slope value of 9.04 %, in a development type of
 Permanent Open Space
 In Accordance With Figure 3-3
 Initial Area Time of Concentration = 6.48 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5}] / (% slope^{(1/3)})$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5})] / (9.040^{(1/3)}) = 6.48$
 The initial area total distance of 126.00 (Ft.) entered leaves a
 remaining distance of 26.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 0.24 minutes
 for a distance of 26.00 (Ft.) and a slope of 9.04 %
 with an elevation difference of 2.35(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation change(Ft.))^{.385} * 60(min/hr)$
 $= 0.242 Minutes$
 $Tt = [(11.9 * 0.0049^3) / (2.35)]^{.385} = 0.24$
 Total initial area Ti = 6.48 minutes from Figure 3-3 formula plus
 0.24 minutes from the Figure 3-4 formula = 6.72 minutes
 Rainfall intensity (I) = 6.095(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
 Subarea runoff = 0.619(CFS)
 Total initial stream area = 0.290(Ac.)

 Process from Point/Station 304.000 to Point/Station 203.000
 Page 2

**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 0.290(Ac.)
 Runoff from this stream = 0.619(CFS)
 Time of concentration = 6.72 min.
 Rainfall intensity = 6.095(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.266	12.25	4.140
2	0.619	6.72	6.095
Qmax(1) =			
	1.000 *	1.000 *	2.266) +
	0.679 *	1.000 *	0.619) + = 2.686
Qmax(2) =			
	1.000 *	0.549 *	2.266) +
	1.000 *	1.000 *	0.619) + = 1.863

Total of 2 main streams to confluence:

Flow rates before confluence point:

2.266 0.619

Maximum flow rates at confluence using above data:

2.686 1.863

Area of streams before confluence:

1.190 0.290

Results of confluence:

Total flow rate = 2.686(CFS)

Time of concentration = 12.247 min.

Effective stream area after confluence = 1.480(Ac.)

†

+++++
 Process from Point/Station 203.000 to Point/Station 204.000
 **** 6 HOUR HYDROGRAPH ****

Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 12.25

Basin Area = 1.48 Acres

6 Hour Rainfall = 2.800 Inches

Runoff Coefficient = 0.438

Peak Discharge = 2.69 CFS

Time (Min)	Discharge (CFS)
------------	-----------------

0	0.000
---	-------

12	0.109
----	-------

24	0.111
----	-------

36	0.117
----	-------

48	0.120
----	-------

60	0.126
----	-------

72	0.130
----	-------

84	0.138
----	-------

96	0.142
----	-------

108	0.153
-----	-------

PR2NORTH2

120	0.158
132	0.172
144	0.180
156	0.200
168	0.212
180	0.243
192	0.264
204	0.322
216	0.367
228	0.539
240	0.759
252	2.686
264	0.432
276	0.289
288	0.226
300	0.190
312	0.165
324	0.147
336	0.134
348	0.123
360	0.114
372	0.107

+++++

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 1 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	0.7	1.3	2.0	2.7
0+ 0	0.0000		0.00	Q				
0+ 1	0.0000		0.01	Q				
0+ 2	0.0000		0.02	Q				
0+ 3	0.0001		0.03	Q				
0+ 4	0.0001		0.04	Q				
0+ 5	0.0002		0.05	Q				
0+ 6	0.0003		0.05	Q				
0+ 7	0.0004		0.06	Q				
0+ 8	0.0005		0.07	VQ				
0+ 9	0.0006		0.08	VQ				
0+10	0.0007		0.09	VQ				
0+11	0.0008		0.10	VQ				
0+12	0.0010		0.11	VQ				
0+13	0.0011		0.11	VQ				
0+14	0.0013		0.11	VQ				
0+15	0.0014		0.11	VQ				
0+16	0.0016		0.11	VQ				
0+17	0.0017		0.11	VQ				
0+18	0.0019		0.11	VQ				
0+19	0.0020		0.11	VQ				
0+20	0.0022		0.11	VQ				
0+21	0.0023		0.11	VQ				
0+22	0.0025		0.11	VQ				
0+23	0.0026		0.11	VQ				
0+24	0.0028		0.11	VQ				
0+25	0.0030		0.11	VQ				
0+26	0.0031		0.11	VQ				
0+27	0.0033		0.11	VQ				
0+28	0.0034		0.11	VQ				
0+29	0.0036		0.11	VQ				
0+30	0.0037		0.11	VQ				
0+31	0.0039		0.11	Q				

PR2NORTH2

0+32	0.0040	0.11	Q
0+33	0.0042	0.12	Q
0+34	0.0044	0.12	Q
0+35	0.0045	0.12	Q
0+36	0.0047	0.12	Q
0+37	0.0048	0.12	Q
0+38	0.0050	0.12	Q
0+39	0.0052	0.12	Q
0+40	0.0053	0.12	Q
0+41	0.0055	0.12	Q
0+42	0.0057	0.12	Q
0+43	0.0058	0.12	Q
0+44	0.0060	0.12	Q
0+45	0.0061	0.12	Q
0+46	0.0063	0.12	Q
0+47	0.0065	0.12	Q
0+48	0.0066	0.12	Q
0+49	0.0068	0.12	Q
0+50	0.0070	0.12	Q
0+51	0.0071	0.12	Q
0+52	0.0073	0.12	Q
0+53	0.0075	0.12	Q
0+54	0.0076	0.12	QV
0+55	0.0078	0.12	QV
0+56	0.0080	0.12	QV
0+57	0.0082	0.12	QV
0+58	0.0083	0.13	QV
0+59	0.0085	0.13	QV
1+ 0	0.0087	0.13	QV
1+ 1	0.0089	0.13	QV
1+ 2	0.0090	0.13	QV
1+ 3	0.0092	0.13	QV
1+ 4	0.0094	0.13	QV
1+ 5	0.0096	0.13	QV
1+ 6	0.0097	0.13	QV
1+ 7	0.0099	0.13	QV
1+ 8	0.0101	0.13	QV
1+ 9	0.0103	0.13	QV
1+10	0.0104	0.13	QV
1+11	0.0106	0.13	QV
1+12	0.0108	0.13	QV
1+13	0.0110	0.13	QV
1+14	0.0112	0.13	QV
1+15	0.0113	0.13	Q V
1+16	0.0115	0.13	Q V
1+17	0.0117	0.13	Q V
1+18	0.0119	0.13	Q V
1+19	0.0121	0.13	QV
1+20	0.0123	0.14	QV
1+21	0.0124	0.14	QV
1+22	0.0126	0.14	QV
1+23	0.0128	0.14	QV
1+24	0.0130	0.14	QV
1+25	0.0132	0.14	QV
1+26	0.0134	0.14	QV
1+27	0.0136	0.14	QV
1+28	0.0138	0.14	QV
1+29	0.0140	0.14	QV
1+30	0.0142	0.14	QV
1+31	0.0144	0.14	QV
1+32	0.0145	0.14	QV
1+33	0.0147	0.14	QV
1+34	0.0149	0.14	QV

PR2NORTH2

1+35	0.0151	0.14	Q	V				
1+36	0.0153	0.14	Q	V				
1+37	0.0155	0.14	Q	V				
1+38	0.0157	0.14	Q	V				
1+39	0.0159	0.14	Q	V				
1+40	0.0161	0.15	Q	V				
1+41	0.0163	0.15	Q	V				
1+42	0.0165	0.15	Q	V				
1+43	0.0167	0.15	Q	V				
1+44	0.0169	0.15	Q	V				
1+45	0.0171	0.15	Q	V				
1+46	0.0173	0.15	Q	V				
1+47	0.0176	0.15	Q	V				
1+48	0.0178	0.15	Q	V				
1+49	0.0180	0.15	Q	V				
1+50	0.0182	0.15	Q	V				
1+51	0.0184	0.15	Q	V				
1+52	0.0186	0.15	Q	V				
1+53	0.0188	0.15	Q	V				
1+54	0.0190	0.16	Q	V				
1+55	0.0193	0.16	Q	V				
1+56	0.0195	0.16	Q	V				
1+57	0.0197	0.16	Q	V				
1+58	0.0199	0.16	Q	V				
1+59	0.0201	0.16	Q	V				
2+ 0	0.0203	0.16	Q	V				
2+ 1	0.0206	0.16	Q	V				
2+ 2	0.0208	0.16	Q	V				
2+ 3	0.0210	0.16	Q	V				
2+ 4	0.0212	0.16	Q	V				
2+ 5	0.0215	0.16	Q	V				
2+ 6	0.0217	0.17	Q	V				
2+ 7	0.0219	0.17	Q	V				
2+ 8	0.0221	0.17	Q	V				
2+ 9	0.0224	0.17	Q	V				
2+10	0.0226	0.17	Q	V				
2+11	0.0228	0.17	Q	V				
2+12	0.0231	0.17	Q	V				
2+13	0.0233	0.17	Q	V				
2+14	0.0236	0.17	Q	V				
2+15	0.0238	0.17	Q	V				
2+16	0.0240	0.17	Q	V				
2+17	0.0243	0.18	Q	V				
2+18	0.0245	0.18	Q	V				
2+19	0.0248	0.18	Q	V				
2+20	0.0250	0.18	Q	V				
2+21	0.0253	0.18	Q	V				
2+22	0.0255	0.18	Q	V				
2+23	0.0258	0.18	Q	V				
2+24	0.0260	0.18	Q	V				
2+25	0.0263	0.18	Q	V				
2+26	0.0265	0.18	Q	V				
2+27	0.0268	0.19	Q	V				
2+28	0.0270	0.19	Q	V				
2+29	0.0273	0.19	Q	V				
2+30	0.0275	0.19	Q	V				
2+31	0.0278	0.19	Q	V				
2+32	0.0281	0.19	Q	V				
2+33	0.0283	0.20	Q	V				
2+34	0.0286	0.20	Q	V				
2+35	0.0289	0.20	Q	V				
2+36	0.0292	0.20	Q	V				
2+37	0.0294	0.20	Q	V				

			PR2NORTH2			
2+38	0.0297	0.20	Q	V		
2+39	0.0300	0.20	Q	V		
2+40	0.0303	0.20	Q	V		
2+41	0.0306	0.21	Q	V		
2+42	0.0308	0.21	Q	V		
2+43	0.0311	0.21	Q	V		
2+44	0.0314	0.21	Q	V		
2+45	0.0317	0.21	Q	V		
2+46	0.0320	0.21	Q	V		
2+47	0.0323	0.21	Q	V		
2+48	0.0326	0.21	Q	V		
2+49	0.0329	0.21	Q	V		
2+50	0.0332	0.22	Q	V		
2+51	0.0335	0.22	Q	V		
2+52	0.0338	0.22	Q	V		
2+53	0.0341	0.23	Q	V		
2+54	0.0344	0.23	Q	V		
2+55	0.0347	0.23	Q	V		
2+56	0.0350	0.23	Q	V		
2+57	0.0354	0.24	Q	V		
2+58	0.0357	0.24	Q	V		
2+59	0.0360	0.24	Q	V		
3+ 0	0.0364	0.24	Q	V		
3+ 1	0.0367	0.24	Q	V		
3+ 2	0.0370	0.25	Q	V		
3+ 3	0.0374	0.25	Q	V		
3+ 4	0.0377	0.25	Q	V		
3+ 5	0.0381	0.25	Q	V		
3+ 6	0.0384	0.25	Q	V		
3+ 7	0.0388	0.26	Q	V		
3+ 8	0.0391	0.26	Q	V		
3+ 9	0.0395	0.26	Q	V		
3+10	0.0398	0.26	Q	V		
3+11	0.0402	0.26	Q	V		
3+12	0.0406	0.26	Q	V		
3+13	0.0409	0.27	Q	V		
3+14	0.0413	0.27	Q	V		
3+15	0.0417	0.28	Q	V		
3+16	0.0421	0.28	Q	V		
3+17	0.0425	0.29	Q	V		
3+18	0.0429	0.29	Q	V		
3+19	0.0433	0.30	Q	V		
3+20	0.0437	0.30	Q	V		
3+21	0.0441	0.31	Q	V		
3+22	0.0446	0.31	Q	V		
3+23	0.0450	0.32	Q	V		
3+24	0.0454	0.32	Q	V		
3+25	0.0459	0.33	Q	V		
3+26	0.0463	0.33	Q	V		
3+27	0.0468	0.33	Q	V		
3+28	0.0473	0.34	Q	V		
3+29	0.0477	0.34	Q	V		
3+30	0.0482	0.34	Q	V		
3+31	0.0487	0.35	Q	V		
3+32	0.0492	0.35	Q	V		
3+33	0.0497	0.36	Q	V		
3+34	0.0502	0.36	Q	V		
3+35	0.0507	0.36	Q	V		
3+36	0.0512	0.37	Q	V		
3+37	0.0517	0.38	Q	V		
3+38	0.0522	0.40	Q	V		
3+39	0.0528	0.41	Q	V		
3+40	0.0534	0.42	Q	V		

			PR2NORTH2			
3+41	0.0540	0.44	Q	V		
3+42	0.0546	0.45	Q	V		
3+43	0.0553	0.47	Q	V		
3+44	0.0559	0.48	Q	V		
3+45	0.0566	0.50	Q	V		
3+46	0.0573	0.51	Q	V		
3+47	0.0580	0.52	Q	V		
3+48	0.0588	0.54	Q	V		
3+49	0.0595	0.56	Q	V		
3+50	0.0603	0.58	Q	V		
3+51	0.0612	0.59	Q	V		
3+52	0.0620	0.61	Q	V		
3+53	0.0629	0.63	Q	V		
3+54	0.0638	0.65	Q	V		
3+55	0.0647	0.67	Q	V		
3+56	0.0656	0.69	Q	V		
3+57	0.0666	0.70	Q	V		
3+58	0.0676	0.72	Q	V		
3+59	0.0686	0.74	Q	V		
4+ 0	0.0697	0.76	Q	V		
4+ 1	0.0709	0.92		Q		
4+ 2	0.0724	1.08		Q		
4+ 3	0.0741	1.24		Q		
4+ 4	0.0761	1.40		Q		
4+ 5	0.0782	1.56		Q		
4+ 6	0.0806	1.72		Q		
4+ 7	0.0832	1.88		Q		
4+ 8	0.0860	2.04		Q		
4+ 9	0.0890	2.20		Q		
4+10	0.0923	2.37		Q		
4+11	0.0958	2.53		Q		
4+12	0.0995	2.69		Q		
4+13	0.1029	2.50		Q		
4+14	0.1061	2.31		Q		
4+15	0.1090	2.12		Q		
4+16	0.1117	1.93		Q		
4+17	0.1141	1.75		Q		
4+18	0.1162	1.56		Q		
4+19	0.1181	1.37		Q		
4+20	0.1197	1.18		Q		
4+21	0.1211	1.00		Q		
4+22	0.1222	0.81		Q		
4+23	0.1231	0.62		Q		
4+24	0.1237	0.43	Q			
4+25	0.1243	0.42	Q			
4+26	0.1248	0.41	Q			
4+27	0.1254	0.40	Q			
4+28	0.1259	0.38	Q			
4+29	0.1264	0.37	Q			
4+30	0.1269	0.36	Q			
4+31	0.1274	0.35	Q			
4+32	0.1279	0.34	Q			
4+33	0.1283	0.32	Q			
4+34	0.1287	0.31	Q			
4+35	0.1291	0.30	Q			
4+36	0.1295	0.29	Q			
4+37	0.1299	0.28	Q			
4+38	0.1303	0.28	Q			
4+39	0.1307	0.27	Q			
4+40	0.1311	0.27	Q			
4+41	0.1314	0.26	Q			
4+42	0.1318	0.26	Q			
4+43	0.1321	0.25	Q			

PR2NORTH2

4+44	0.1325	0.25	Q		V
4+45	0.1328	0.24	Q		V
4+46	0.1331	0.24	Q		V
4+47	0.1334	0.23	Q		V
4+48	0.1338	0.23	Q		V
4+49	0.1341	0.22	Q		V
4+50	0.1344	0.22	Q		V
4+51	0.1347	0.22	Q		V
4+52	0.1350	0.21	Q		V
4+53	0.1353	0.21	Q		V
4+54	0.1355	0.21	Q		V
4+55	0.1358	0.20	Q		V
4+56	0.1361	0.20	Q		V
4+57	0.1364	0.20	Q		V
4+58	0.1366	0.20	Q		V
4+59	0.1369	0.19	Q		V
5+ 0	0.1372	0.19	Q		V
5+ 1	0.1374	0.19	Q		V
5+ 2	0.1377	0.19	Q		V
5+ 3	0.1379	0.18	Q		V
5+ 4	0.1382	0.18	Q		V
5+ 5	0.1384	0.18	Q		V
5+ 6	0.1387	0.18	Q		V
5+ 7	0.1389	0.18	Q		V
5+ 8	0.1392	0.17	Q		V
5+ 9	0.1394	0.17	Q		V
5+10	0.1396	0.17	Q		V
5+11	0.1399	0.17	Q		V
5+12	0.1401	0.16	Q		V
5+13	0.1403	0.16	Q		V
5+14	0.1405	0.16	Q		V
5+15	0.1408	0.16	Q		V
5+16	0.1410	0.16	Q		V
5+17	0.1412	0.16	Q		V
5+18	0.1414	0.16	Q		V
5+19	0.1416	0.15	Q		V
5+20	0.1418	0.15	Q		V
5+21	0.1420	0.15	Q		V
5+22	0.1422	0.15	Q		V
5+23	0.1424	0.15	Q		V
5+24	0.1427	0.15	Q		V
5+25	0.1429	0.15	Q		V
5+26	0.1431	0.14	Q		V
5+27	0.1433	0.14	Q		V
5+28	0.1434	0.14	Q		V
5+29	0.1436	0.14	Q		V
5+30	0.1438	0.14	Q		V
5+31	0.1440	0.14	Q		V
5+32	0.1442	0.14	Q		V
5+33	0.1444	0.14	Q		V
5+34	0.1446	0.14	Q		V
5+35	0.1448	0.13	Q		V
5+36	0.1450	0.13	Q		V
5+37	0.1451	0.13	Q		V
5+38	0.1453	0.13	Q		V
5+39	0.1455	0.13	Q		V
5+40	0.1457	0.13	Q		V
5+41	0.1459	0.13	Q		V
5+42	0.1460	0.13	Q		V
5+43	0.1462	0.13	Q		V
5+44	0.1464	0.13	Q		V
5+45	0.1466	0.13	Q		V
5+46	0.1467	0.12	Q		V

PR2NORTH2									
5+47	0.1469	0.12	Q						V
5+48	0.1471	0.12	Q						V
5+49	0.1472	0.12	Q						V
5+50	0.1474	0.12	Q						V
5+51	0.1476	0.12	Q						V
5+52	0.1477	0.12	Q						V
5+53	0.1479	0.12	Q						V
5+54	0.1481	0.12	Q						V
5+55	0.1482	0.12	Q						V
5+56	0.1484	0.12	Q						V
5+57	0.1485	0.12	Q						V
5+58	0.1487	0.12	Q						V
5+59	0.1489	0.11	Q						V
6+ 0	0.1490	0.11	Q						V
6+ 1	0.1492	0.11	Q						V
6+ 2	0.1493	0.11	Q						V
6+ 3	0.1495	0.11	Q						V
6+ 4	0.1496	0.11	Q						V
6+ 5	0.1498	0.11	Q						V
6+ 6	0.1499	0.11	Q						V
6+ 7	0.1501	0.11	Q						V
6+ 8	0.1502	0.11	Q						V
6+ 9	0.1504	0.11	Q						V
6+10	0.1505	0.11	Q						V
6+11	0.1507	0.11	Q						V
6+12	0.1508	0.11	Q						V

End of computations, total study area = 1.480 (Ac.)

PR2NORTHDET

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
Study date: 09/24/15

Program License Serial Number 6313

***** HYDROGRAPH INFORMATION *****

From study/file name: PR2NORTH2.rte
*****HYDROGRAPH DATA*****
Number of intervals = 372
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 2.686 (CFS)
Total volume = 0.151 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

+++++
Process from Point/Station 203.000 to Point/Station 204.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 372
Hydrograph time unit = 1.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:
Basin Depth Storage Outflow (S-O*dt/2) (S+O*dt/2)
(Ft.) (Ac.Ft) (CFS) (Ac.Ft) (Ac.Ft)

0.000 0.000 0.000 0.000 0.000
0.500 0.015 0.650 0.015 0.015
1.000 0.023 2.340 0.021 0.025

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	0	0.7	1.34	2.01	2.69	Depth (Ft.)
0.017	0.01	0.00	0.000	0					0.00

PR2NORTHDET									
0.033	0.02	0.00	0.000	0					0.00
0.050	0.03	0.00	0.000	0					0.00
0.067	0.04	0.00	0.000	0					0.00
0.083	0.05	0.01	0.000	0					0.00
0.100	0.05	0.01	0.000	0					0.01
0.117	0.06	0.01	0.000	0					0.01
0.133	0.07	0.01	0.000	0					0.01
0.150	0.08	0.02	0.000	0					0.01
0.167	0.09	0.02	0.001	OI					0.02
0.183	0.10	0.03	0.001	OI					0.02
0.200	0.11	0.03	0.001	OI					0.02
0.217	0.11	0.04	0.001	OI					0.03
0.233	0.11	0.04	0.001	OI					0.03
0.250	0.11	0.04	0.001	OI					0.03
0.267	0.11	0.05	0.001	OI					0.04
0.283	0.11	0.05	0.001	OI					0.04
0.300	0.11	0.05	0.001	OI					0.04
0.317	0.11	0.06	0.001	OI					0.04
0.333	0.11	0.06	0.001	OI					0.05
0.350	0.11	0.06	0.001	OI					0.05
0.367	0.11	0.07	0.002	OI					0.05
0.383	0.11	0.07	0.002	OI					0.05
0.400	0.11	0.07	0.002	OI					0.06
0.417	0.11	0.07	0.002	OI					0.06
0.433	0.11	0.08	0.002	OI					0.06
0.450	0.11	0.08	0.002	OI					0.06
0.467	0.11	0.08	0.002	OI					0.06
0.483	0.11	0.08	0.002	OI					0.06
0.500	0.11	0.08	0.002	0					0.06
0.517	0.11	0.09	0.002	0					0.07
0.533	0.11	0.09	0.002	0					0.07
0.550	0.12	0.09	0.002	0					0.07
0.567	0.12	0.09	0.002	0					0.07
0.583	0.12	0.09	0.002	0					0.07
0.600	0.12	0.09	0.002	0					0.07
0.617	0.12	0.09	0.002	0					0.07
0.633	0.12	0.10	0.002	0					0.07
0.650	0.12	0.10	0.002	0					0.07
0.667	0.12	0.10	0.002	0					0.08
0.683	0.12	0.10	0.002	0					0.08
0.700	0.12	0.10	0.002	0					0.08
0.717	0.12	0.10	0.002	0					0.08
0.733	0.12	0.10	0.002	0					0.08
0.750	0.12	0.10	0.002	0					0.08
0.767	0.12	0.10	0.002	0					0.08
0.783	0.12	0.11	0.002	0					0.08
0.800	0.12	0.11	0.002	0					0.08
0.817	0.12	0.11	0.002	0					0.08
0.833	0.12	0.11	0.002	0					0.08
0.850	0.12	0.11	0.003	0					0.08
0.867	0.12	0.11	0.003	0					0.08
0.883	0.12	0.11	0.003	0					0.08
0.900	0.12	0.11	0.003	0					0.09
0.917	0.12	0.11	0.003	0					0.09
0.933	0.12	0.11	0.003	0					0.09
0.950	0.12	0.11	0.003	0					0.09
0.967	0.13	0.11	0.003	0					0.09
0.983	0.13	0.11	0.003	0					0.09
1.000	0.13	0.11	0.003	0					0.09
1.017	0.13	0.12	0.003	0					0.09
1.033	0.13	0.12	0.003	0					0.09
1.050	0.13	0.12	0.003	0					0.09
1.067	0.13	0.12	0.003	0					0.09

PR2NORTHDET									
1.083	0.13	0.12	0.003	0					0.09
1.100	0.13	0.12	0.003	0					0.09
1.117	0.13	0.12	0.003	0					0.09
1.133	0.13	0.12	0.003	0					0.09
1.150	0.13	0.12	0.003	0					0.09
1.167	0.13	0.12	0.003	0					0.09
1.183	0.13	0.12	0.003	0					0.09
1.200	0.13	0.12	0.003	0					0.09
1.217	0.13	0.12	0.003	0					0.09
1.233	0.13	0.12	0.003	0					0.09
1.250	0.13	0.12	0.003	0					0.09
1.267	0.13	0.12	0.003	0					0.10
1.283	0.13	0.12	0.003	0					0.10
1.300	0.13	0.12	0.003	0					0.10
1.317	0.13	0.13	0.003	0					0.10
1.333	0.14	0.13	0.003	0					0.10
1.350	0.14	0.13	0.003	0					0.10
1.367	0.14	0.13	0.003	0					0.10
1.383	0.14	0.13	0.003	0					0.10
1.400	0.14	0.13	0.003	0					0.10
1.417	0.14	0.13	0.003	0					0.10
1.433	0.14	0.13	0.003	0					0.10
1.450	0.14	0.13	0.003	0					0.10
1.467	0.14	0.13	0.003	0					0.10
1.483	0.14	0.13	0.003	0					0.10
1.500	0.14	0.13	0.003	0					0.10
1.517	0.14	0.13	0.003	0					0.10
1.533	0.14	0.13	0.003	0					0.10
1.550	0.14	0.13	0.003	0					0.10
1.567	0.14	0.13	0.003	0					0.10
1.583	0.14	0.13	0.003	0					0.10
1.600	0.14	0.13	0.003	0					0.10
1.617	0.14	0.13	0.003	0					0.10
1.633	0.14	0.14	0.003	0					0.10
1.650	0.14	0.14	0.003	0					0.10
1.667	0.15	0.14	0.003	0					0.10
1.683	0.15	0.14	0.003	0					0.11
1.700	0.15	0.14	0.003	0					0.11
1.717	0.15	0.14	0.003	0					0.11
1.733	0.15	0.14	0.003	0					0.11
1.750	0.15	0.14	0.003	0					0.11
1.767	0.15	0.14	0.003	0					0.11
1.783	0.15	0.14	0.003	0					0.11
1.800	0.15	0.14	0.003	0					0.11
1.817	0.15	0.14	0.003	0					0.11
1.833	0.15	0.14	0.003	0					0.11
1.850	0.15	0.14	0.003	0					0.11
1.867	0.15	0.14	0.003	0					0.11
1.883	0.15	0.14	0.003	0					0.11
1.900	0.16	0.15	0.003	0					0.11
1.917	0.16	0.15	0.003	0					0.11
1.933	0.16	0.15	0.003	0					0.11
1.950	0.16	0.15	0.003	0					0.11
1.967	0.16	0.15	0.003	0					0.11
1.983	0.16	0.15	0.003	0					0.11
2.000	0.16	0.15	0.003	0					0.11
2.017	0.16	0.15	0.003	0					0.11
2.033	0.16	0.15	0.003	0					0.12
2.050	0.16	0.15	0.003	0					0.12
2.067	0.16	0.15	0.003	0					0.12
2.083	0.16	0.15	0.004	0					0.12
2.100	0.17	0.15	0.004	0					0.12
2.117	0.17	0.15	0.004	0					0.12

PR2NORTHDET									
2.133	0.17	0.15	0.004	O					0.12
2.150	0.17	0.16	0.004	OI					0.12
2.167	0.17	0.16	0.004	OI					0.12
2.183	0.17	0.16	0.004	OI					0.12
2.200	0.17	0.16	0.004	OI					0.12
2.217	0.17	0.16	0.004	OI					0.12
2.233	0.17	0.16	0.004	OI					0.12
2.250	0.17	0.16	0.004	OI					0.12
2.267	0.17	0.16	0.004	OI					0.12
2.283	0.18	0.16	0.004	OI					0.12
2.300	0.18	0.16	0.004	OI					0.13
2.317	0.18	0.16	0.004	OI					0.13
2.333	0.18	0.16	0.004	OI					0.13
2.350	0.18	0.17	0.004	OI					0.13
2.367	0.18	0.17	0.004	OI					0.13
2.383	0.18	0.17	0.004	OI					0.13
2.400	0.18	0.17	0.004	OI					0.13
2.417	0.18	0.17	0.004	O					0.13
2.433	0.18	0.17	0.004	O					0.13
2.450	0.19	0.17	0.004	O					0.13
2.467	0.19	0.17	0.004	O					0.13
2.483	0.19	0.17	0.004	O					0.13
2.500	0.19	0.17	0.004	O					0.13
2.517	0.19	0.17	0.004	O					0.13
2.533	0.19	0.18	0.004	O					0.13
2.550	0.20	0.18	0.004	O					0.14
2.567	0.20	0.18	0.004	O					0.14
2.583	0.20	0.18	0.004	O					0.14
2.600	0.20	0.18	0.004	O					0.14
2.617	0.20	0.18	0.004	O					0.14
2.633	0.20	0.18	0.004	O					0.14
2.650	0.20	0.18	0.004	O					0.14
2.667	0.20	0.18	0.004	O					0.14
2.683	0.21	0.19	0.004	O					0.14
2.700	0.21	0.19	0.004	O					0.14
2.717	0.21	0.19	0.004	O					0.14
2.733	0.21	0.19	0.004	O					0.15
2.750	0.21	0.19	0.004	O					0.15
2.767	0.21	0.19	0.004	O					0.15
2.783	0.21	0.19	0.004	O					0.15
2.800	0.21	0.19	0.004	O					0.15
2.817	0.21	0.19	0.004	O					0.15
2.833	0.22	0.20	0.005	O					0.15
2.850	0.22	0.20	0.005	O					0.15
2.867	0.22	0.20	0.005	O					0.15
2.883	0.23	0.20	0.005	O					0.15
2.900	0.23	0.20	0.005	O					0.16
2.917	0.23	0.20	0.005	O					0.16
2.933	0.23	0.20	0.005	O					0.16
2.950	0.24	0.21	0.005	O					0.16
2.967	0.24	0.21	0.005	O					0.16
2.983	0.24	0.21	0.005	O					0.16
3.000	0.24	0.21	0.005	O					0.16
3.017	0.24	0.21	0.005	O					0.16
3.033	0.25	0.22	0.005	O					0.17
3.050	0.25	0.22	0.005	O					0.17
3.067	0.25	0.22	0.005	O					0.17
3.083	0.25	0.22	0.005	O					0.17
3.100	0.25	0.22	0.005	OI					0.17
3.117	0.26	0.22	0.005	OI					0.17
3.133	0.26	0.23	0.005	OI					0.17
3.150	0.26	0.23	0.005	OI					0.18
3.167	0.26	0.23	0.005	OI					0.18

				PR2NORTHDET							
3.183	0.26	0.23	0.005	OI							0.18
3.200	0.26	0.23	0.005	OI							0.18
3.217	0.27	0.24	0.005	OI							0.18
3.233	0.27	0.24	0.005	OI							0.18
3.250	0.28	0.24	0.006	OI							0.18
3.267	0.28	0.24	0.006	OI							0.19
3.283	0.29	0.24	0.006	OI							0.19
3.300	0.29	0.25	0.006	OI							0.19
3.317	0.30	0.25	0.006	OI							0.19
3.333	0.30	0.25	0.006	O							0.19
3.350	0.31	0.26	0.006	O							0.20
3.367	0.31	0.26	0.006	O							0.20
3.383	0.32	0.26	0.006	O							0.20
3.400	0.32	0.27	0.006	O							0.20
3.417	0.33	0.27	0.006	O							0.21
3.433	0.33	0.27	0.006	O							0.21
3.450	0.33	0.28	0.006	O							0.21
3.467	0.34	0.28	0.006	OI							0.21
3.483	0.34	0.28	0.007	OI							0.22
3.500	0.34	0.29	0.007	OI							0.22
3.517	0.35	0.29	0.007	OI							0.22
3.533	0.35	0.29	0.007	OI							0.23
3.550	0.36	0.30	0.007	OI							0.23
3.567	0.36	0.30	0.007	OI							0.23
3.583	0.36	0.30	0.007	OI							0.23
3.600	0.37	0.31	0.007	OI							0.24
3.617	0.38	0.31	0.007	OI							0.24
3.633	0.40	0.32	0.007	OI							0.24
3.650	0.41	0.32	0.007	OI							0.25
3.667	0.42	0.33	0.008	O I							0.25
3.683	0.44	0.33	0.008	O I							0.26
3.700	0.45	0.34	0.008	OI							0.26
3.717	0.47	0.35	0.008	OI							0.27
3.733	0.48	0.35	0.008	OI							0.27
3.750	0.50	0.36	0.008	OI							0.28
3.767	0.51	0.37	0.009	O I							0.28
3.783	0.52	0.38	0.009	O I							0.29
3.800	0.54	0.39	0.009	O I							0.30
3.817	0.56	0.40	0.009	O I							0.30
3.833	0.58	0.41	0.009	O I							0.31
3.850	0.59	0.42	0.010	O I							0.32
3.867	0.61	0.43	0.010	O I							0.33
3.883	0.63	0.44	0.010	O I							0.34
3.900	0.65	0.45	0.010	O I							0.35
3.917	0.67	0.46	0.011	O I							0.36
3.933	0.69	0.47	0.011	O I							0.37
3.950	0.70	0.49	0.011	O I							0.38
3.967	0.72	0.50	0.012	O I							0.39
3.983	0.74	0.51	0.012	O I							0.40
4.000	0.76	0.53	0.012	O I							0.41
4.017	0.92	0.55	0.013	O I							0.42
4.033	1.08	0.57	0.013	O I							0.44
4.050	1.24	0.61	0.014	O I							0.47
4.067	1.40	0.65	0.015	O I							0.50
4.083	1.56	0.85	0.016	O I							0.56
4.100	1.72	1.05	0.017	O I							0.62
4.117	1.88	1.24	0.018	O I							0.68
4.133	2.04	1.43	0.019	O I							0.73
4.150	2.20	1.60	0.020	O I							0.78
4.167	2.37	1.78	0.020	O I							0.83
4.183	2.53	1.95	0.021	O I							0.88
4.200	2.69	2.11	0.022	O I							0.93
4.217	2.50	2.24	0.023	O I							0.97

				PR2NORTHDET							
4.233	2.31	2.28	0.023							0	0.98
4.250	2.12	2.26	0.023							IO	0.98
4.267	1.93	2.20	0.022							0	0.96
4.283	1.75	2.11	0.022						I	0	0.93
4.300	1.56	1.99	0.021					I		0	0.90
4.317	1.37	1.86	0.021					I		0	0.86
4.333	1.18	1.71	0.020				I		0		0.81
4.350	1.00	1.55	0.019			I			0		0.77
4.367	0.81	1.39	0.018			I			0		0.72
4.383	0.62	1.22	0.018		I				0		0.67
4.400	0.43	1.04	0.017		I				0		0.62
4.417	0.42	0.89	0.016		I				0		0.57
4.433	0.41	0.77	0.016		I				0		0.53
4.450	0.40	0.67	0.015		I				0		0.51
4.467	0.38	0.64	0.015		I	0					0.49
4.483	0.37	0.62	0.014		I	0					0.48
4.500	0.36	0.61	0.014		I	0					0.47
4.517	0.35	0.59	0.014		I	0					0.46
4.533	0.34	0.58	0.013		I	0					0.45
4.550	0.32	0.57	0.013		I	0					0.43
4.567	0.31	0.55	0.013		I	0					0.42
4.583	0.30	0.54	0.012		I	0					0.41
4.600	0.29	0.52	0.012		I	0					0.40
4.617	0.28	0.51	0.012		I	0					0.39
4.633	0.28	0.50	0.011		I	0					0.38
4.650	0.27	0.48	0.011		I	0					0.37
4.667	0.27	0.47	0.011		I	0					0.36
4.683	0.26	0.46	0.011		I	0					0.35
4.700	0.26	0.45	0.010		I	0					0.34
4.717	0.25	0.44	0.010		I	0					0.34
4.733	0.25	0.43	0.010		I	0					0.33
4.750	0.24	0.42	0.010		I	0					0.32
4.767	0.24	0.40	0.009		I	0					0.31
4.783	0.23	0.39	0.009		I	0					0.30
4.800	0.23	0.39	0.009		I	0					0.30
4.817	0.22	0.38	0.009		I	0					0.29
4.833	0.22	0.37	0.008		I	0					0.28
4.850	0.22	0.36	0.008		I	0					0.28
4.867	0.21	0.35	0.008		I	0					0.27
4.883	0.21	0.34	0.008		I	0					0.26
4.900	0.21	0.33	0.008		IO						0.26
4.917	0.20	0.33	0.008		IO						0.25
4.933	0.20	0.32	0.007		IO						0.25
4.950	0.20	0.31	0.007		IO						0.24
4.967	0.20	0.31	0.007		IO						0.24
4.983	0.19	0.30	0.007		IO						0.23
5.000	0.19	0.29	0.007		IO						0.23
5.017	0.19	0.29	0.007		IO						0.22
5.033	0.19	0.28	0.006		IO						0.22
5.050	0.18	0.28	0.006		IO						0.21
5.067	0.18	0.27	0.006		IO						0.21
5.083	0.18	0.27	0.006		IO						0.20
5.100	0.18	0.26	0.006		IO						0.20
5.117	0.18	0.26	0.006		IO						0.20
5.133	0.17	0.25	0.006		0						0.19
5.150	0.17	0.25	0.006		0						0.19
5.167	0.17	0.24	0.006		0						0.19
5.183	0.17	0.24	0.005		IO						0.18
5.200	0.16	0.23	0.005		IO						0.18
5.217	0.16	0.23	0.005		IO						0.18
5.233	0.16	0.23	0.005		IO						0.17
5.250	0.16	0.22	0.005		IO						0.17
5.267	0.16	0.22	0.005		IO						0.17

PR2NORTHDET						
5.283	0.16	0.21	0.005	IO		0.17
5.300	0.16	0.21	0.005	IO		0.16
5.317	0.15	0.21	0.005	IO		0.16
5.333	0.15	0.20	0.005	IO		0.16
5.350	0.15	0.20	0.005	IO		0.16
5.367	0.15	0.20	0.005	IO		0.15
5.383	0.15	0.20	0.005	IO		0.15
5.400	0.15	0.19	0.004	IO		0.15
5.417	0.15	0.19	0.004	IO		0.15
5.433	0.14	0.19	0.004	IO		0.14
5.450	0.14	0.19	0.004	IO		0.14
5.467	0.14	0.18	0.004	IO		0.14
5.483	0.14	0.18	0.004	IO		0.14
5.500	0.14	0.18	0.004	IO		0.14
5.517	0.14	0.18	0.004	IO		0.14
5.533	0.14	0.17	0.004	IO		0.13
5.550	0.14	0.17	0.004	IO		0.13
5.567	0.14	0.17	0.004	IO		0.13
5.583	0.13	0.17	0.004	O		0.13
5.600	0.13	0.17	0.004	O		0.13
5.617	0.13	0.16	0.004	O		0.13
5.633	0.13	0.16	0.004	O		0.12
5.650	0.13	0.16	0.004	O		0.12
5.667	0.13	0.16	0.004	O		0.12
5.683	0.13	0.16	0.004	O		0.12
5.700	0.13	0.16	0.004	O		0.12
5.717	0.13	0.15	0.004	O		0.12
5.733	0.13	0.15	0.004	O		0.12
5.750	0.13	0.15	0.003	O		0.12
5.767	0.12	0.15	0.003	O		0.11
5.783	0.12	0.15	0.003	O		0.11
5.800	0.12	0.15	0.003	O		0.11
5.817	0.12	0.14	0.003	O		0.11
5.833	0.12	0.14	0.003	O		0.11
5.850	0.12	0.14	0.003	O		0.11
5.867	0.12	0.14	0.003	O		0.11
5.883	0.12	0.14	0.003	O		0.11
5.900	0.12	0.14	0.003	O		0.11
5.917	0.12	0.14	0.003	O		0.11
5.933	0.12	0.14	0.003	O		0.10
5.950	0.12	0.13	0.003	O		0.10
5.967	0.12	0.13	0.003	O		0.10
5.983	0.11	0.13	0.003	O		0.10
6.000	0.11	0.13	0.003	O		0.10
6.017	0.11	0.13	0.003	O		0.10
6.033	0.11	0.13	0.003	O		0.10
6.050	0.11	0.13	0.003	O		0.10
6.067	0.11	0.13	0.003	O		0.10
6.083	0.11	0.13	0.003	O		0.10
6.100	0.11	0.13	0.003	O		0.10
6.117	0.11	0.12	0.003	O		0.10
6.133	0.11	0.12	0.003	O		0.10
6.150	0.11	0.12	0.003	O		0.09
6.167	0.11	0.12	0.003	O		0.09
6.183	0.11	0.12	0.003	O		0.09
6.200	0.11	0.12	0.003	O		0.09
6.217	0.00	0.12	0.003	IO		0.09
6.233	0.00	0.11	0.003	IO		0.08
6.250	0.00	0.10	0.002	IO		0.08
6.267	0.00	0.10	0.002	IO		0.07
6.283	0.00	0.09	0.002	IO		0.07
6.300	0.00	0.09	0.002	IO		0.07
6.317	0.00	0.08	0.002	O		0.06

PR2NORTHDET									
6.333	0.00	0.08	0.002	0					0.06
6.350	0.00	0.07	0.002	0					0.06
6.367	0.00	0.07	0.002	0					0.05
6.383	0.00	0.06	0.001	0					0.05
6.400	0.00	0.06	0.001	0					0.05
6.417	0.00	0.06	0.001	0					0.04
6.433	0.00	0.05	0.001	0					0.04
6.450	0.00	0.05	0.001	0					0.04
6.467	0.00	0.05	0.001	0					0.04
6.483	0.00	0.04	0.001	0					0.03
6.500	0.00	0.04	0.001	0					0.03
6.517	0.00	0.04	0.001	0					0.03
6.533	0.00	0.04	0.001	0					0.03
6.550	0.00	0.04	0.001	0					0.03
6.567	0.00	0.03	0.001	0					0.03
6.583	0.00	0.03	0.001	0					0.02
6.600	0.00	0.03	0.001	0					0.02
6.617	0.00	0.03	0.001	0					0.02
6.633	0.00	0.03	0.001	0					0.02
6.650	0.00	0.02	0.001	0					0.02
6.667	0.00	0.02	0.001	0					0.02
6.683	0.00	0.02	0.001	0					0.02
6.700	0.00	0.02	0.000	0					0.02
6.717	0.00	0.02	0.000	0					0.01
6.733	0.00	0.02	0.000	0					0.01
6.750	0.00	0.02	0.000	0					0.01
6.767	0.00	0.02	0.000	0					0.01
6.783	0.00	0.02	0.000	0					0.01
6.800	0.00	0.01	0.000	0					0.01
6.817	0.00	0.01	0.000	0					0.01
6.833	0.00	0.01	0.000	0					0.01
6.850	0.00	0.01	0.000	0					0.01
6.867	0.00	0.01	0.000	0					0.01
6.883	0.00	0.01	0.000	0					0.01
6.900	0.00	0.01	0.000	0					0.01
6.917	0.00	0.01	0.000	0					0.01
6.933	0.00	0.01	0.000	0					0.01
6.950	0.00	0.01	0.000	0					0.01
6.967	0.00	0.01	0.000	0					0.01
6.983	0.00	0.01	0.000	0					0.01
7.000	0.00	0.01	0.000	0					0.01
7.017	0.00	0.01	0.000	0					0.01
7.033	0.00	0.01	0.000	0					0.00
7.050	0.00	0.01	0.000	0					0.00
7.067	0.00	0.01	0.000	0					0.00
7.083	0.00	0.01	0.000	0					0.00
7.100	0.00	0.00	0.000	0					0.00
7.117	0.00	0.00	0.000	0					0.00
7.133	0.00	0.00	0.000	0					0.00
7.150	0.00	0.00	0.000	0					0.00
7.167	0.00	0.00	0.000	0					0.00
7.183	0.00	0.00	0.000	0					0.00
7.200	0.00	0.00	0.000	0					0.00
7.217	0.00	0.00	0.000	0					0.00
7.233	0.00	0.00	0.000	0					0.00
7.250	0.00	0.00	0.000	0					0.00
7.267	0.00	0.00	0.000	0					0.00
7.283	0.00	0.00	0.000	0					0.00
7.300	0.00	0.00	0.000	0					0.00
7.317	0.00	0.00	0.000	0					0.00
7.333	0.00	0.00	0.000	0					0.00
7.350	0.00	0.00	0.000	0					0.00
7.367	0.00	0.00	0.000	0					0.00

PR2NORTHDET					
7.383	0.00	0.00	0.000	0	0.00
7.400	0.00	0.00	0.000	0	0.00
7.417	0.00	0.00	0.000	0	0.00
7.433	0.00	0.00	0.000	0	0.00
7.450	0.00	0.00	0.000	0	0.00
7.467	0.00	0.00	0.000	0	0.00
7.483	0.00	0.00	0.000	0	0.00

```

*****HYDROGRAPH DATA*****
      Number of intervals = 449
      Time interval = 1.0 (Min.)
      Maximum/Peak flow rate = 2.278 (CFS)
      Total volume = 0.151 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****

```

PR2NORTHBASIN

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 09/24/15

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

Process from Point/Station 201.000 to Point/Station 203.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
Rainfall intensity (I) = 3.594(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 15.25 min. Rain intensity = 3.59(In/Hr)
Total area = 1.480(Ac.) Total runoff = 2.278(CFS)

Process from Point/Station 203.000 to Point/Station 204.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 394.000(Ft.)
Downstream point/station elevation = 391.320(Ft.)
Pipe length = 105.00(Ft.) Slope = 0.0255 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.278(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 2.278(CFS)
Normal flow depth in pipe = 5.28(In.)
Flow top width inside pipe = 11.91(In.)
Critical Depth = 7.75(In.)
Pipe flow velocity = 6.84(Ft/s)
Travel time through pipe = 0.26 min.
Time of concentration (TC) = 15.51 min.
End of computations, total study area = 1.480 (Ac.)

PR3ANORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 200.000(Ft.)
Highest elevation = 394.850(Ft.)
Lowest elevation = 389.820(Ft.)
Elevation difference = 5.030(Ft.) Slope = 2.515 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 2.52 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.47 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4600) * (100.000^{.5}) / (2.515^{(1/3)})] = 8.47$
The initial area total distance of 200.00 (Ft.) entered leaves a
remaining distance of 100.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.12 minutes
for a distance of 100.00 (Ft.) and a slope of 2.52 %
with an elevation difference of 2.52(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 1.118 Minutes
 $Tt = [(11.9 * 0.0189^3) / (2.52)]^{.385} = 1.12$
Total initial area Ti = 8.47 minutes from Figure 3-3 formula plus
1.12 minutes from the Figure 3-4 formula = 9.59 minutes
Rainfall intensity (I) = 4.847(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.460

PR3ANORTH
Subarea runoff = 2.047(CFS)
Total initial stream area = 0.918(Ac.)

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 387.840(Ft.)
Downstream point/station elevation = 384.000(Ft.)
Pipe length = 34.00(Ft.) Slope = 0.1129 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.047(CFS)
Given pipe size = 8.00(In.)
Calculated individual pipe flow = 2.047(CFS)
Normal flow depth in pipe = 4.02(In.)
Flow top width inside pipe = 8.00(In.)
Critical Depth = 7.55(In.)
Pipe flow velocity = 11.66(Ft/s)
Travel time through pipe = 0.05 min.
Time of concentration (TC) = 9.64 min.

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 0.918(Ac.)
Runoff from this stream = 2.047(CFS)
Time of concentration = 9.64 min.
Rainfall intensity = 4.831(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 304.000 to Point/Station 303.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 298.000(Ft.)
Highest elevation = 408.390(Ft.)
Lowest elevation = 384.000(Ft.)
Elevation difference = 24.390(Ft.) Slope = 8.185 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.19 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.70 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{1.49} / (Slope^{1/3})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{1.49}) / (8.185^{1/3})] = 6.70$
The initial area total distance of 298.00 (Ft.) entered leaves a
remaining distance of 198.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.20 minutes
for a distance of 198.00 (Ft.) and a slope of 8.19 %

PR3ANORTH

with an elevation difference of 16.21(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3 / (\text{elevation change}(\text{Ft.}))]^{\wedge}.385 * 60(\text{min/hr})$
 = 1.201 Minutes
 $Tt = [(11.9 * 0.0375^3) / (16.21)]^{\wedge}.385 = 1.20$
 Total initial area $Ti = 6.70$ minutes from Figure 3-3 formula plus
 1.20 minutes from the Figure 3-4 formula = 7.90 minutes
 Rainfall intensity (I) = 5.493(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is $C = 0.350$
 Subarea runoff = 1.209(CFS)
 Total initial stream area = 0.629(Ac.)

 Process from Point/Station 304.000 to Point/Station 303.000
 ***** CONFLUENCE OF MAIN STREAMS *****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 0.629(Ac.)
 Runoff from this stream = 1.209(CFS)
 Time of concentration = 7.90 min.
 Rainfall intensity = 5.493(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.047	9.64	4.831
2	1.209	7.90	5.493

$Q_{\text{max}}(1) = 1.000 * 1.000 * 2.047) + 0.880 * 1.000 * 1.209) + = 3.110$
 $Q_{\text{max}}(2) = 1.000 * 0.820 * 2.047) + 1.000 * 1.000 * 1.209) + = 2.887$

Total of 2 main streams to confluence:

Flow rates before confluence point:

2.047 1.209

Maximum flow rates at confluence using above data:

3.110 2.887

Area of streams before confluence:

0.918 0.629

Results of confluence:

Total flow rate = 3.110(CFS)

Time of concentration = 9.638 min.

Effective stream area after confluence = 1.547(Ac.)

 Process from Point/Station 303.000 to Point/Station 306.000
 ***** PIPEFLOW TRAVEL TIME (User specified size) *****

Upstream point/station elevation = 381.000(Ft.)
 Downstream point/station elevation = 373.120(Ft.)
 Pipe length = 155.00(Ft.) Slope = 0.0508 Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 3.110(CFS)
 Given pipe size = 12.00(In.)
 Calculated individual pipe flow = 3.110(CFS)
 Normal flow depth in pipe = 5.19(In.)

PR3ANORTH
Flow top width inside pipe = 11.89(In.)
Critical Depth = 9.07(In.)
Pipe flow velocity = 9.58(Ft/s)
Travel time through pipe = 0.27 min.
Time of concentration (TC) = 9.91 min.
End of computations, total study area = 1.547 (Ac.)

Detention Design

Pipe:

diameter 11 inches 0.92 ft
coefficient 0.013

$$Q = C_o A_o \sqrt{2g(H_o)} \quad (6-12)$$

where ...

Q = orifice flow discharge (ft³/s);
 C_o = orifice discharge coefficient;
 A_o = cross-sectional area of flow through the orifice (ft²);
 g = gravitational acceleration (32.2 ft/s²);
 H_o = effective head above orifice (ft); and

San Diego County Drainage Design Manual
July 2005

Page 6-11

C_o = 0.60 from Table 6.1 County Drainage Design Manual
 A_o = 0.66 sf
 g = 32.20 sf/sec
 C = 2.90

Stage	Depth (ft)	Effective Head (Ho)	Volume (cf)	Area (Ac.ft)	Orifice Flow (cfs)
384.00	0.00	0.00	0	0.000	0.00
384.50	0.50	0.04	594	0.014	0.65
385.00	1.00	0.54	1187	0.027	2.34

Hydrology Parameters

Before Detention
 Q = 3.110 cfs
 A = 1.547 Acre
 T_c = 9.64 min.
 C = 0.460
 I = 4.700 in/hr

After Detention
 Δt = 3.00 min.
 Q = 2.225 cfs
 A = 1.547 Acre
 T_c = 12.64 min.

PR3ANORTHHYD

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 200.000(Ft.)
Highest elevation = 394.850(Ft.)
Lowest elevation = 389.820(Ft.)
Elevation difference = 5.030(Ft.) Slope = 2.515 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 2.52 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.47 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4600) * (100.000^{.5}) / (2.515^{(1/3)})] = 8.47$
The initial area total distance of 200.00 (Ft.) entered leaves a
remaining distance of 100.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.12 minutes
for a distance of 100.00 (Ft.) and a slope of 2.52 %
with an elevation difference of 2.52(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 1.118 Minutes
 $Tt = [(11.9 * 0.0189^3) / (2.52)]^{.385} = 1.12$
Total initial area Ti = 8.47 minutes from Figure 3-3 formula plus
1.12 minutes from the Figure 3-4 formula = 9.59 minutes
Rainfall intensity (I) = 4.847(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.460

PR3ANORTHHYD
Subarea runoff = 2.047(CFS)
Total initial stream area = 0.918(Ac.)

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 387.840(Ft.)
Downstream point/station elevation = 384.000(Ft.)
Pipe length = 34.00(Ft.) Slope = 0.1129 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.047(CFS)
Given pipe size = 8.00(In.)
Calculated individual pipe flow = 2.047(CFS)
Normal flow depth in pipe = 4.02(In.)
Flow top width inside pipe = 8.00(In.)
Critical Depth = 7.55(In.)
Pipe flow velocity = 11.66(Ft/s)
Travel time through pipe = 0.05 min.
Time of concentration (TC) = 9.64 min.

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 0.918(Ac.)
Runoff from this stream = 2.047(CFS)
Time of concentration = 9.64 min.
Rainfall intensity = 4.831(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 304.000 to Point/Station 303.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 298.000(Ft.)
Highest elevation = 408.390(Ft.)
Lowest elevation = 384.000(Ft.)
Elevation difference = 24.390(Ft.) Slope = 8.185 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.19 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.70 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{1.5} / (\% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{1.5}) / (8.185^{(1/3)})] = 6.70$
The initial area total distance of 298.00 (Ft.) entered leaves a
remaining distance of 198.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.20 minutes
for a distance of 198.00 (Ft.) and a slope of 8.19 %

PR3ANORTHHYD

with an elevation difference of 16.21(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3] / (\text{elevation change}(\text{Ft.}))^{.385} * 60(\text{min/hr})$
 = 1.201 Minutes
 $Tt = [(11.9 * 0.0375^3) / (16.21)]^{.385} = 1.20$
 Total initial area $Ti = 6.70$ minutes from Figure 3-3 formula plus
 1.20 minutes from the Figure 3-4 formula = 7.90 minutes
 Rainfall intensity (I) = 5.493(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is $C = 0.350$
 Subarea runoff = 1.209(CFS)
 Total initial stream area = 0.629(Ac.)

 Process from Point/Station 304.000 to Point/Station 303.000
 ***** CONFLUENCE OF MAIN STREAMS *****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 0.629(Ac.)
 Runoff from this stream = 1.209(CFS)
 Time of concentration = 7.90 min.
 Rainfall intensity = 5.493(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.047	9.64	4.831
2	1.209	7.90	5.493
Qmax(1) =			
	1.000 *	1.000 *	2.047) +
	0.880 *	1.000 *	1.209) + = 3.110
Qmax(2) =			
	1.000 *	0.820 *	2.047) +
	1.000 *	1.000 *	1.209) + = 2.887

Total of 2 main streams to confluence:

Flow rates before confluence point:

2.047 1.209

Maximum flow rates at confluence using above data:

3.110 2.887

Area of streams before confluence:

0.918 0.629

Results of confluence:

Total flow rate = 3.110(CFS)

Time of concentration = 9.638 min.

Effective stream area after confluence = 1.547(Ac.)

 Process from Point/Station 303.000 to Point/Station 306.000
 ***** 6 HOUR HYDROGRAPH *****

Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 9.64

Basin Area = 1.55 Acres

6 Hour Rainfall = 2.800 Inches

PR3ANORTHHYD

Runoff Coefficient = 0.415
 Peak Discharge = 3.11 CFS
 Time (Min) Discharge (CFS)

0	0.000
9	0.106
18	0.109
27	0.111
36	0.115
45	0.117
54	0.122
63	0.124
72	0.130
81	0.133
90	0.139
99	0.143
108	0.150
117	0.155
126	0.164
135	0.170
144	0.182
153	0.189
162	0.205
171	0.215
180	0.238
189	0.253
198	0.290
207	0.314
216	0.384
225	0.437
234	0.642
243	0.905
252	3.110
261	0.515
270	0.345
279	0.270
288	0.226
297	0.197
306	0.175
315	0.159
324	0.146
333	0.136
342	0.127
351	0.120
360	0.113
369	0.108

+++++

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 1 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	0.8	1.6	2.3	3.1
0+ 0	0.0000	0.00	Q					
0+ 1	0.0000	0.01	Q					
0+ 2	0.0000	0.02	Q					
0+ 3	0.0001	0.04	Q					
0+ 4	0.0002	0.05	Q					
0+ 5	0.0002	0.06	Q					
0+ 6	0.0003	0.07	Q					
0+ 7	0.0005	0.08	VQ					
0+ 8	0.0006	0.09	VQ					

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0+ 9	0.0007	0.11	VQ
0+10	0.0009	0.11	VQ
0+11	0.0010	0.11	VQ
0+12	0.0012	0.11	VQ
0+13	0.0013	0.11	VQ
0+14	0.0015	0.11	VQ
0+15	0.0016	0.11	VQ
0+16	0.0018	0.11	VQ
0+17	0.0019	0.11	VQ
0+18	0.0021	0.11	VQ
0+19	0.0022	0.11	VQ
0+20	0.0024	0.11	VQ
0+21	0.0025	0.11	VQ
0+22	0.0027	0.11	VQ
0+23	0.0028	0.11	VQ
0+24	0.0030	0.11	VQ
0+25	0.0031	0.11	VQ
0+26	0.0033	0.11	VQ
0+27	0.0034	0.11	VQ
0+28	0.0036	0.11	VQ
0+29	0.0037	0.11	Q
0+30	0.0039	0.11	Q
0+31	0.0041	0.11	Q
0+32	0.0042	0.11	Q
0+33	0.0044	0.11	Q
0+34	0.0045	0.11	Q
0+35	0.0047	0.11	Q
0+36	0.0048	0.12	Q
0+37	0.0050	0.12	Q
0+38	0.0052	0.12	Q
0+39	0.0053	0.12	Q
0+40	0.0055	0.12	Q
0+41	0.0056	0.12	Q
0+42	0.0058	0.12	Q
0+43	0.0060	0.12	Q
0+44	0.0061	0.12	Q
0+45	0.0063	0.12	Q
0+46	0.0064	0.12	Q
0+47	0.0066	0.12	Q
0+48	0.0068	0.12	Q
0+49	0.0069	0.12	Q
0+50	0.0071	0.12	Q
0+51	0.0073	0.12	Q
0+52	0.0074	0.12	QV
0+53	0.0076	0.12	QV
0+54	0.0078	0.12	QV
0+55	0.0079	0.12	QV
0+56	0.0081	0.12	QV
0+57	0.0083	0.12	QV
0+58	0.0084	0.12	QV
0+59	0.0086	0.12	QV
1+ 0	0.0088	0.12	QV
1+ 1	0.0090	0.12	QV
1+ 2	0.0091	0.12	QV
1+ 3	0.0093	0.12	QV
1+ 4	0.0095	0.13	QV
1+ 5	0.0096	0.13	QV
1+ 6	0.0098	0.13	QV
1+ 7	0.0100	0.13	QV
1+ 8	0.0102	0.13	QV
1+ 9	0.0103	0.13	QV
1+10	0.0105	0.13	QV
1+11	0.0107	0.13	QV

PR3ANORTHHYD

1+12	0.0109	0.13	QV				
1+13	0.0111	0.13	QV				
1+14	0.0112	0.13	Q V				
1+15	0.0114	0.13	Q V				
1+16	0.0116	0.13	Q V				
1+17	0.0118	0.13	Q V				
1+18	0.0120	0.13	Q V				
1+19	0.0121	0.13	Q V				
1+20	0.0123	0.13	Q V				
1+21	0.0125	0.13	Q V				
1+22	0.0127	0.13	Q V				
1+23	0.0129	0.13	Q V				
1+24	0.0131	0.13	Q V				
1+25	0.0132	0.14	Q V				
1+26	0.0134	0.14	Q V				
1+27	0.0136	0.14	Q V				
1+28	0.0138	0.14	Q V				
1+29	0.0140	0.14	Q V				
1+30	0.0142	0.14	Q V				
1+31	0.0144	0.14	Q V				
1+32	0.0146	0.14	Q V				
1+33	0.0148	0.14	Q V				
1+34	0.0150	0.14	Q V				
1+35	0.0152	0.14	Q V				
1+36	0.0154	0.14	Q V				
1+37	0.0156	0.14	Q V				
1+38	0.0157	0.14	Q V				
1+39	0.0159	0.14	Q V				
1+40	0.0161	0.14	Q V				
1+41	0.0163	0.14	Q V				
1+42	0.0165	0.15	Q V				
1+43	0.0167	0.15	Q V				
1+44	0.0169	0.15	Q V				
1+45	0.0171	0.15	Q V				
1+46	0.0174	0.15	Q V				
1+47	0.0176	0.15	Q V				
1+48	0.0178	0.15	Q V				
1+49	0.0180	0.15	Q V				
1+50	0.0182	0.15	Q V				
1+51	0.0184	0.15	Q V				
1+52	0.0186	0.15	Q V				
1+53	0.0188	0.15	Q V				
1+54	0.0190	0.15	Q V				
1+55	0.0192	0.15	Q V				
1+56	0.0194	0.15	Q V				
1+57	0.0197	0.15	Q V				
1+58	0.0199	0.16	Q V				
1+59	0.0201	0.16	Q V				
2+ 0	0.0203	0.16	Q V				
2+ 1	0.0205	0.16	Q V				
2+ 2	0.0207	0.16	Q V				
2+ 3	0.0210	0.16	Q V				
2+ 4	0.0212	0.16	Q V				
2+ 5	0.0214	0.16	Q V				
2+ 6	0.0216	0.16	Q V				
2+ 7	0.0219	0.16	Q V				
2+ 8	0.0221	0.17	Q V				
2+ 9	0.0223	0.17	Q V				
2+10	0.0226	0.17	Q V				
2+11	0.0228	0.17	Q V				
2+12	0.0230	0.17	Q V				
2+13	0.0232	0.17	Q V				
2+14	0.0235	0.17	Q V				

PR3ANORTHHYD

2+15	0.0237	0.17	Q	V			
2+16	0.0239	0.17	Q	V			
2+17	0.0242	0.17	Q	V			
2+18	0.0244	0.17	Q	V			
2+19	0.0247	0.17	Q	V			
2+20	0.0249	0.18	Q	V			
2+21	0.0252	0.18	Q	V			
2+22	0.0254	0.18	Q	V			
2+23	0.0256	0.18	Q	V			
2+24	0.0259	0.18	Q	V			
2+25	0.0261	0.18	Q	V			
2+26	0.0264	0.18	Q	V			
2+27	0.0267	0.18	Q	V			
2+28	0.0269	0.18	Q	V			
2+29	0.0272	0.19	Q	V			
2+30	0.0274	0.19	Q	V			
2+31	0.0277	0.19	Q	V			
2+32	0.0279	0.19	Q	V			
2+33	0.0282	0.19	Q	V			
2+34	0.0285	0.19	Q	V			
2+35	0.0287	0.19	Q	V			
2+36	0.0290	0.19	Q	V			
2+37	0.0293	0.20	Q	V			
2+38	0.0295	0.20	Q	V			
2+39	0.0298	0.20	Q	V			
2+40	0.0301	0.20	Q	V			
2+41	0.0304	0.20	Q	V			
2+42	0.0307	0.21	Q	V			
2+43	0.0309	0.21	Q	V			
2+44	0.0312	0.21	Q	V			
2+45	0.0315	0.21	Q	V			
2+46	0.0318	0.21	Q	V			
2+47	0.0321	0.21	Q	V			
2+48	0.0324	0.21	Q	V			
2+49	0.0327	0.21	Q	V			
2+50	0.0330	0.21	Q	V			
2+51	0.0333	0.21	Q	V			
2+52	0.0336	0.22	Q	V			
2+53	0.0339	0.22	Q	V			
2+54	0.0342	0.22	Q	V			
2+55	0.0345	0.23	Q	V			
2+56	0.0348	0.23	Q	V			
2+57	0.0351	0.23	Q	V			
2+58	0.0354	0.23	Q	V			
2+59	0.0358	0.24	Q	V			
3+ 0	0.0361	0.24	Q	V			
3+ 1	0.0364	0.24	Q	V			
3+ 2	0.0368	0.24	Q	V			
3+ 3	0.0371	0.24	Q	V			
3+ 4	0.0374	0.24	Q	V			
3+ 5	0.0378	0.25	Q	V			
3+ 6	0.0381	0.25	Q	V			
3+ 7	0.0385	0.25	Q	V			
3+ 8	0.0388	0.25	Q	V			
3+ 9	0.0391	0.25	Q	V			
3+10	0.0395	0.26	Q	V			
3+11	0.0399	0.26	Q	V			
3+12	0.0402	0.27	Q	V			
3+13	0.0406	0.27	Q	V			
3+14	0.0410	0.27	Q	V			
3+15	0.0414	0.28	Q	V			
3+16	0.0417	0.28	Q	V			
3+17	0.0421	0.29	Q	V			

			PR3ANORTHTHYD				
3+18	0.0425	0.29	Q	V			
3+19	0.0429	0.29	Q	V			
3+20	0.0433	0.30	Q	V			
3+21	0.0438	0.30	Q	V			
3+22	0.0442	0.30	Q	V			
3+23	0.0446	0.30	Q	V			
3+24	0.0450	0.31	Q	V			
3+25	0.0454	0.31	Q	V			
3+26	0.0459	0.31	Q	V			
3+27	0.0463	0.31	Q	V			
3+28	0.0467	0.32	Q	V			
3+29	0.0472	0.33	Q	V			
3+30	0.0477	0.34	Q	V			
3+31	0.0481	0.35	Q	V			
3+32	0.0486	0.35	Q	V			
3+33	0.0491	0.36	Q	V			
3+34	0.0496	0.37	Q	V			
3+35	0.0501	0.38	Q	V			
3+36	0.0507	0.38	Q	V			
3+37	0.0512	0.39	Q	V			
3+38	0.0518	0.40	Q	V			
3+39	0.0523	0.40	Q	V			
3+40	0.0529	0.41	Q	V			
3+41	0.0534	0.41	Q	V			
3+42	0.0540	0.42	Q	V			
3+43	0.0546	0.43	Q	V			
3+44	0.0552	0.43	Q	V			
3+45	0.0558	0.44	Q	V			
3+46	0.0564	0.46	Q	V			
3+47	0.0571	0.48	Q	V			
3+48	0.0578	0.51	Q	V			
3+49	0.0585	0.53	Q	V			
3+50	0.0593	0.55	Q	V			
3+51	0.0601	0.57	Q	V			
3+52	0.0609	0.60	Q	V			
3+53	0.0617	0.62	Q	V			
3+54	0.0626	0.64	Q	V			
3+55	0.0636	0.67	Q	V			
3+56	0.0645	0.70	Q	V			
3+57	0.0655	0.73	Q	V			
3+58	0.0666	0.76	Q	V			
3+59	0.0677	0.79	Q	V			
4+ 0	0.0688	0.82	Q	V			
4+ 1	0.0700	0.85	Q	V			
4+ 2	0.0712	0.88	Q	V			
4+ 3	0.0724	0.91	Q	V			
4+ 4	0.0740	1.15		Q			
4+ 5	0.0759	1.40		Q			
4+ 6	0.0782	1.64		Q			
4+ 7	0.0808	1.89		Q			
4+ 8	0.0837	2.13		Q			
4+ 9	0.0870	2.38		Q			
4+10	0.0906	2.62		Q			
4+11	0.0945	2.87		Q			
4+12	0.0988	3.11		Q			
4+13	0.1027	2.82		Q			
4+14	0.1062	2.53		Q			
4+15	0.1093	2.25		Q			
4+16	0.1120	1.96		Q			
4+17	0.1143	1.67		Q			
4+18	0.1162	1.38		Q			
4+19	0.1177	1.09		Q			
4+20	0.1188	0.80		Q			

PR3ANORTHHYD

4+21	0.1195	0.52	Q	V
4+22	0.1202	0.50	Q	V
4+23	0.1208	0.48	Q	V
4+24	0.1215	0.46	Q	V
4+25	0.1221	0.44	Q	V
4+26	0.1227	0.42	Q	V
4+27	0.1232	0.40	Q	V
4+28	0.1237	0.38	Q	V
4+29	0.1242	0.36	Q	V
4+30	0.1247	0.34	Q	V
4+31	0.1252	0.34	Q	V
4+32	0.1256	0.33	Q	V
4+33	0.1261	0.32	Q	V
4+34	0.1265	0.31	Q	V
4+35	0.1269	0.30	Q	V
4+36	0.1273	0.29	Q	V
4+37	0.1277	0.29	Q	V
4+38	0.1281	0.28	Q	V
4+39	0.1285	0.27	Q	V
4+40	0.1288	0.26	Q	V
4+41	0.1292	0.26	Q	V
4+42	0.1295	0.26	Q	V
4+43	0.1299	0.25	Q	V
4+44	0.1302	0.25	Q	V
4+45	0.1306	0.24	Q	V
4+46	0.1309	0.24	Q	V
4+47	0.1312	0.23	Q	V
4+48	0.1315	0.23	Q	V
4+49	0.1318	0.22	Q	V
4+50	0.1321	0.22	Q	V
4+51	0.1324	0.22	Q	V
4+52	0.1327	0.21	Q	V
4+53	0.1330	0.21	Q	V
4+54	0.1333	0.21	Q	V
4+55	0.1336	0.20	Q	V
4+56	0.1338	0.20	Q	V
4+57	0.1341	0.20	Q	V
4+58	0.1344	0.19	Q	V
4+59	0.1346	0.19	Q	V
5+ 0	0.1349	0.19	Q	V
5+ 1	0.1352	0.19	Q	V
5+ 2	0.1354	0.18	Q	V
5+ 3	0.1357	0.18	Q	V
5+ 4	0.1359	0.18	Q	V
5+ 5	0.1362	0.18	Q	V
5+ 6	0.1364	0.18	Q	V
5+ 7	0.1366	0.17	Q	V
5+ 8	0.1369	0.17	Q	V
5+ 9	0.1371	0.17	Q	V
5+10	0.1373	0.17	Q	V
5+11	0.1376	0.17	Q	V
5+12	0.1378	0.16	Q	V
5+13	0.1380	0.16	Q	V
5+14	0.1382	0.16	Q	V
5+15	0.1385	0.16	Q	V
5+16	0.1387	0.16	Q	V
5+17	0.1389	0.16	Q	V
5+18	0.1391	0.15	Q	V
5+19	0.1393	0.15	Q	V
5+20	0.1395	0.15	Q	V
5+21	0.1397	0.15	Q	V
5+22	0.1399	0.15	Q	V
5+23	0.1401	0.15	Q	V

PR3ANORTHHYD

5+24	0.1403	0.15	Q				V
5+25	0.1405	0.15	Q				V
5+26	0.1407	0.14	Q				V
5+27	0.1409	0.14	Q				V
5+28	0.1411	0.14	Q				V
5+29	0.1413	0.14	Q				V
5+30	0.1415	0.14	Q				V
5+31	0.1417	0.14	Q				V
5+32	0.1419	0.14	Q				V
5+33	0.1421	0.14	Q				V
5+34	0.1423	0.13	Q				V
5+35	0.1425	0.13	Q				V
5+36	0.1426	0.13	Q				V
5+37	0.1428	0.13	Q				V
5+38	0.1430	0.13	Q				V
5+39	0.1432	0.13	Q				V
5+40	0.1434	0.13	Q				V
5+41	0.1435	0.13	Q				V
5+42	0.1437	0.13	Q				V
5+43	0.1439	0.13	Q				V
5+44	0.1441	0.13	Q				V
5+45	0.1442	0.12	Q				V
5+46	0.1444	0.12	Q				V
5+47	0.1446	0.12	Q				V
5+48	0.1447	0.12	Q				V
5+49	0.1449	0.12	Q				V
5+50	0.1451	0.12	Q				V
5+51	0.1452	0.12	Q				V
5+52	0.1454	0.12	Q				V
5+53	0.1456	0.12	Q				V
5+54	0.1457	0.12	Q				V
5+55	0.1459	0.12	Q				V
5+56	0.1460	0.12	Q				V
5+57	0.1462	0.12	Q				V
5+58	0.1464	0.11	Q				V
5+59	0.1465	0.11	Q				V
6+ 0	0.1467	0.11	Q				V
6+ 1	0.1468	0.11	Q				V
6+ 2	0.1470	0.11	Q				V
6+ 3	0.1471	0.11	Q				V
6+ 4	0.1473	0.11	Q				V
6+ 5	0.1474	0.11	Q				V
6+ 6	0.1476	0.11	Q				V
6+ 7	0.1477	0.11	Q				V
6+ 8	0.1479	0.11	Q				V
6+ 9	0.1480	0.11	Q				V

End of computations, total study area = 1.547 (Ac.)

PR3ANORTHDET

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
Study date: 05/01/17

Program License Serial Number 6313

***** HYDROGRAPH INFORMATION *****

From study/file name: PR3ANORTHHYD.rte
*****HYDROGRAPH DATA*****
Number of intervals = 369
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 3.110 (CFS)
Total volume = 0.148 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 369
Hydrograph time unit = 1.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:
Basin Depth Storage Outflow (S-0*dt/2) (S+0*dt/2)
(Ft.) (Ac.Ft) (CFS) (Ac.Ft) (Ac.Ft)

0.000 0.000 0.000 0.000 0.000
0.500 0.014 0.650 0.014 0.014
1.000 0.027 2.340 0.025 0.029

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	0	0.8	1.56	2.33	3.11	Depth (Ft.)

PR3ANORTHDET									
0.017	0.01	0.00	0.000	0					0.00
0.033	0.02	0.00	0.000	0					0.00
0.050	0.04	0.00	0.000	0					0.00
0.067	0.05	0.01	0.000	0					0.00
0.083	0.06	0.01	0.000	0					0.01
0.100	0.07	0.01	0.000	0					0.01
0.117	0.08	0.02	0.000	0					0.01
0.133	0.09	0.02	0.000	0					0.02
0.150	0.11	0.03	0.001	OI					0.02
0.167	0.11	0.03	0.001	OI					0.02
0.183	0.11	0.04	0.001	OI					0.03
0.200	0.11	0.04	0.001	OI					0.03
0.217	0.11	0.04	0.001	OI					0.03
0.233	0.11	0.05	0.001	OI					0.04
0.250	0.11	0.05	0.001	OI					0.04
0.267	0.11	0.05	0.001	OI					0.04
0.283	0.11	0.06	0.001	OI					0.04
0.300	0.11	0.06	0.001	OI					0.05
0.317	0.11	0.06	0.001	OI					0.05
0.333	0.11	0.07	0.001	OI					0.05
0.350	0.11	0.07	0.002	OI					0.05
0.367	0.11	0.07	0.002	OI					0.06
0.383	0.11	0.07	0.002	OI					0.06
0.400	0.11	0.08	0.002	OI					0.06
0.417	0.11	0.08	0.002	OI					0.06
0.433	0.11	0.08	0.002	OI					0.06
0.450	0.11	0.08	0.002	OI					0.06
0.467	0.11	0.08	0.002	OI					0.07
0.483	0.11	0.09	0.002	OI					0.07
0.500	0.11	0.09	0.002	OI					0.07
0.517	0.11	0.09	0.002	OI					0.07
0.533	0.11	0.09	0.002	OI					0.07
0.550	0.11	0.09	0.002	OI					0.07
0.567	0.11	0.09	0.002	OI					0.07
0.583	0.11	0.09	0.002	OI					0.07
0.600	0.12	0.10	0.002	OI					0.07
0.617	0.12	0.10	0.002	0					0.07
0.633	0.12	0.10	0.002	0					0.08
0.650	0.12	0.10	0.002	0					0.08
0.667	0.12	0.10	0.002	0					0.08
0.683	0.12	0.10	0.002	0					0.08
0.700	0.12	0.10	0.002	0					0.08
0.717	0.12	0.10	0.002	0					0.08
0.733	0.12	0.10	0.002	0					0.08
0.750	0.12	0.11	0.002	0					0.08
0.767	0.12	0.11	0.002	0					0.08
0.783	0.12	0.11	0.002	0					0.08
0.800	0.12	0.11	0.002	0					0.08
0.817	0.12	0.11	0.002	0					0.08
0.833	0.12	0.11	0.002	0					0.08
0.850	0.12	0.11	0.002	0					0.08
0.867	0.12	0.11	0.002	0					0.08
0.883	0.12	0.11	0.002	0					0.09
0.900	0.12	0.11	0.002	0					0.09
0.917	0.12	0.11	0.002	0					0.09
0.933	0.12	0.11	0.002	0					0.09
0.950	0.12	0.11	0.002	0					0.09
0.967	0.12	0.11	0.002	0					0.09
0.983	0.12	0.11	0.002	0					0.09
1.000	0.12	0.12	0.002	0					0.09
1.017	0.12	0.12	0.002	0					0.09
1.033	0.12	0.12	0.003	0					0.09
1.050	0.12	0.12	0.003	0					0.09

PR3ANORTHDET

1.067	0.13	0.12	0.003	0					0.09
1.083	0.13	0.12	0.003	0					0.09
1.100	0.13	0.12	0.003	0					0.09
1.117	0.13	0.12	0.003	0					0.09
1.133	0.13	0.12	0.003	0					0.09
1.150	0.13	0.12	0.003	0					0.09
1.167	0.13	0.12	0.003	0					0.09
1.183	0.13	0.12	0.003	0					0.09
1.200	0.13	0.12	0.003	0					0.09
1.217	0.13	0.12	0.003	0					0.09
1.233	0.13	0.12	0.003	0					0.09
1.250	0.13	0.12	0.003	0					0.09
1.267	0.13	0.12	0.003	0					0.09
1.283	0.13	0.12	0.003	0					0.10
1.300	0.13	0.12	0.003	0					0.10
1.317	0.13	0.12	0.003	0					0.10
1.333	0.13	0.13	0.003	0					0.10
1.350	0.13	0.13	0.003	0					0.10
1.367	0.13	0.13	0.003	0					0.10
1.383	0.13	0.13	0.003	0					0.10
1.400	0.13	0.13	0.003	0					0.10
1.417	0.14	0.13	0.003	0					0.10
1.433	0.14	0.13	0.003	0					0.10
1.450	0.14	0.13	0.003	0					0.10
1.467	0.14	0.13	0.003	0					0.10
1.483	0.14	0.13	0.003	0					0.10
1.500	0.14	0.13	0.003	0					0.10
1.517	0.14	0.13	0.003	0					0.10
1.533	0.14	0.13	0.003	0					0.10
1.550	0.14	0.13	0.003	0					0.10
1.567	0.14	0.13	0.003	0					0.10
1.583	0.14	0.13	0.003	0					0.10
1.600	0.14	0.13	0.003	0					0.10
1.617	0.14	0.13	0.003	0					0.10
1.633	0.14	0.13	0.003	0					0.10
1.650	0.14	0.14	0.003	0					0.10
1.667	0.14	0.14	0.003	0					0.10
1.683	0.14	0.14	0.003	0					0.10
1.700	0.15	0.14	0.003	0					0.11
1.717	0.15	0.14	0.003	0					0.11
1.733	0.15	0.14	0.003	0					0.11
1.750	0.15	0.14	0.003	0					0.11
1.767	0.15	0.14	0.003	0					0.11
1.783	0.15	0.14	0.003	0					0.11
1.800	0.15	0.14	0.003	0					0.11
1.817	0.15	0.14	0.003	0					0.11
1.833	0.15	0.14	0.003	0					0.11
1.850	0.15	0.14	0.003	0					0.11
1.867	0.15	0.14	0.003	0					0.11
1.883	0.15	0.14	0.003	0					0.11
1.900	0.15	0.14	0.003	0					0.11
1.917	0.15	0.14	0.003	0					0.11
1.933	0.15	0.15	0.003	0					0.11
1.950	0.15	0.15	0.003	0					0.11
1.967	0.16	0.15	0.003	0					0.11
1.983	0.16	0.15	0.003	0					0.11
2.000	0.16	0.15	0.003	0					0.11
2.017	0.16	0.15	0.003	0					0.11
2.033	0.16	0.15	0.003	0					0.11
2.050	0.16	0.15	0.003	0					0.12
2.067	0.16	0.15	0.003	0					0.12
2.083	0.16	0.15	0.003	0					0.12
2.100	0.16	0.15	0.003	0					0.12

PR3ANORTHDET

2.117	0.16	0.15	0.003	0				0.12
2.133	0.17	0.15	0.003	0				0.12
2.150	0.17	0.15	0.003	0				0.12
2.167	0.17	0.15	0.003	0				0.12
2.183	0.17	0.16	0.003	0				0.12
2.200	0.17	0.16	0.003	0				0.12
2.217	0.17	0.16	0.003	0				0.12
2.233	0.17	0.16	0.003	0				0.12
2.250	0.17	0.16	0.003	0				0.12
2.267	0.17	0.16	0.003	0				0.12
2.283	0.17	0.16	0.003	0				0.12
2.300	0.17	0.16	0.003	0				0.12
2.317	0.17	0.16	0.003	0				0.12
2.333	0.18	0.16	0.004	0				0.13
2.350	0.18	0.16	0.004	0				0.13
2.367	0.18	0.16	0.004	0				0.13
2.383	0.18	0.17	0.004	0				0.13
2.400	0.18	0.17	0.004	0				0.13
2.417	0.18	0.17	0.004	0				0.13
2.433	0.18	0.17	0.004	0				0.13
2.450	0.18	0.17	0.004	0				0.13
2.467	0.18	0.17	0.004	0				0.13
2.483	0.19	0.17	0.004	0				0.13
2.500	0.19	0.17	0.004	0				0.13
2.517	0.19	0.17	0.004	0				0.13
2.533	0.19	0.17	0.004	0				0.13
2.550	0.19	0.17	0.004	0				0.13
2.567	0.19	0.18	0.004	0				0.14
2.583	0.19	0.18	0.004	0				0.14
2.600	0.19	0.18	0.004	0				0.14
2.617	0.20	0.18	0.004	OI				0.14
2.633	0.20	0.18	0.004	OI				0.14
2.650	0.20	0.18	0.004	OI				0.14
2.667	0.20	0.18	0.004	OI				0.14
2.683	0.20	0.18	0.004	OI				0.14
2.700	0.21	0.18	0.004	OI				0.14
2.717	0.21	0.19	0.004	OI				0.14
2.733	0.21	0.19	0.004	OI				0.14
2.750	0.21	0.19	0.004	OI				0.15
2.767	0.21	0.19	0.004	OI				0.15
2.783	0.21	0.19	0.004	OI				0.15
2.800	0.21	0.19	0.004	OI				0.15
2.817	0.21	0.19	0.004	OI				0.15
2.833	0.21	0.19	0.004	0				0.15
2.850	0.21	0.20	0.004	0				0.15
2.867	0.22	0.20	0.004	0				0.15
2.883	0.22	0.20	0.004	0				0.15
2.900	0.22	0.20	0.004	0				0.15
2.917	0.23	0.20	0.004	0				0.16
2.933	0.23	0.20	0.004	0				0.16
2.950	0.23	0.20	0.004	0				0.16
2.967	0.23	0.21	0.004	0				0.16
2.983	0.24	0.21	0.004	0				0.16
3.000	0.24	0.21	0.005	0				0.16
3.017	0.24	0.21	0.005	0				0.16
3.033	0.24	0.21	0.005	0				0.16
3.050	0.24	0.22	0.005	0				0.17
3.067	0.24	0.22	0.005	0				0.17
3.083	0.25	0.22	0.005	0				0.17
3.100	0.25	0.22	0.005	0				0.17
3.117	0.25	0.22	0.005	0				0.17
3.133	0.25	0.22	0.005	0				0.17
3.150	0.25	0.23	0.005	0				0.17

PR3ANORTHDET

[illegible]

				PR3ANORTHDET										
4.217	2.82	2.10	0.025							0		I		0.93
4.233	2.53	2.19	0.026							0		I		0.96
4.250	2.25	2.22	0.026							0				0.97
4.267	1.96	2.20	0.026							I	0			0.96
4.283	1.67	2.14	0.025							0				0.94
4.300	1.38	2.04	0.025						I	0				0.91
4.317	1.09	1.91	0.024					I		0				0.87
4.333	0.80	1.75	0.022							0				0.83
4.350	0.52	1.57	0.021		I				I	0				0.77
4.367	0.50	1.40	0.020		I					0				0.72
4.383	0.48	1.25	0.019		I				0					0.68
4.400	0.46	1.12	0.018		I				0					0.64
4.417	0.44	1.01	0.017		I				0					0.61
4.433	0.42	0.91	0.016		I				0					0.58
4.450	0.40	0.83	0.015		I			0						0.55
4.467	0.38	0.76	0.015		I		0							0.53
4.483	0.36	0.70	0.014		I		0							0.51
4.500	0.34	0.65	0.014		I	0								0.50
4.517	0.34	0.63	0.014		I	0								0.48
4.533	0.33	0.61	0.013		I	0								0.47
4.550	0.32	0.59	0.013		I	0								0.45
4.567	0.31	0.57	0.012		I	0								0.44
4.583	0.30	0.56	0.012		I	0								0.43
4.600	0.29	0.54	0.012		I	0								0.42
4.617	0.29	0.53	0.011		I	0								0.40
4.633	0.28	0.51	0.011		I	0								0.39
4.650	0.27	0.50	0.011		I	0								0.38
4.667	0.26	0.48	0.010		I	0								0.37
4.683	0.26	0.47	0.010		I	0								0.36
4.700	0.26	0.46	0.010		I	0								0.35
4.717	0.25	0.44	0.010		I	0								0.34
4.733	0.25	0.43	0.009		I	0								0.33
4.750	0.24	0.42	0.009		I	0								0.32
4.767	0.24	0.41	0.009		I	0								0.31
4.783	0.23	0.40	0.009		I	0								0.31
4.800	0.23	0.39	0.008		IO									0.30
4.817	0.22	0.38	0.008		IO									0.29
4.833	0.22	0.37	0.008		IO									0.28
4.850	0.22	0.36	0.008		IO									0.28
4.867	0.21	0.35	0.008		IO									0.27
4.883	0.21	0.34	0.007		IO									0.26
4.900	0.21	0.33	0.007		IO									0.26
4.917	0.20	0.32	0.007		IO									0.25
4.933	0.20	0.32	0.007		IO									0.24
4.950	0.20	0.31	0.007		IO									0.24
4.967	0.19	0.30	0.007		I 0									0.23
4.983	0.19	0.30	0.006		I 0									0.23
5.000	0.19	0.29	0.006		IO									0.22
5.017	0.19	0.28	0.006		IO									0.22
5.033	0.18	0.28	0.006		IO									0.21
5.050	0.18	0.27	0.006		IO									0.21
5.067	0.18	0.27	0.006		IO									0.20
5.083	0.18	0.26	0.006		IO									0.20
5.100	0.18	0.25	0.005		IO									0.20
5.117	0.17	0.25	0.005		IO									0.19
5.133	0.17	0.25	0.005		IO									0.19
5.150	0.17	0.24	0.005		IO									0.18
5.167	0.17	0.24	0.005		IO									0.18
5.183	0.17	0.23	0.005		IO									0.18
5.200	0.16	0.23	0.005		IO									0.18
5.217	0.16	0.22	0.005		IO									0.17
5.233	0.16	0.22	0.005		IO									0.17
5.250	0.16	0.22	0.005		IO									0.17

PR3ANORTHDET

5.267	0.16	0.21	0.005	IO					0.16
5.283	0.16	0.21	0.005	IO					0.16
5.300	0.15	0.21	0.004	IO					0.16
5.317	0.15	0.20	0.004	IO					0.16
5.333	0.15	0.20	0.004	IO					0.15
5.350	0.15	0.20	0.004	IO					0.15
5.367	0.15	0.19	0.004	0					0.15
5.383	0.15	0.19	0.004	0					0.15
5.400	0.15	0.19	0.004	0					0.14
5.417	0.15	0.19	0.004	0					0.14
5.433	0.14	0.18	0.004	0					0.14
5.450	0.14	0.18	0.004	0					0.14
5.467	0.14	0.18	0.004	0					0.14
5.483	0.14	0.18	0.004	0					0.14
5.500	0.14	0.17	0.004	0					0.13
5.517	0.14	0.17	0.004	0					0.13
5.533	0.14	0.17	0.004	0					0.13
5.550	0.14	0.17	0.004	0					0.13
5.567	0.13	0.17	0.004	0					0.13
5.583	0.13	0.16	0.004	0					0.13
5.600	0.13	0.16	0.003	0					0.12
5.617	0.13	0.16	0.003	0					0.12
5.633	0.13	0.16	0.003	0					0.12
5.650	0.13	0.16	0.003	0					0.12
5.667	0.13	0.15	0.003	0					0.12
5.683	0.13	0.15	0.003	0					0.12
5.700	0.13	0.15	0.003	0					0.12
5.717	0.13	0.15	0.003	0					0.12
5.733	0.13	0.15	0.003	0					0.11
5.750	0.12	0.15	0.003	0					0.11
5.767	0.12	0.15	0.003	0					0.11
5.783	0.12	0.14	0.003	0					0.11
5.800	0.12	0.14	0.003	0					0.11
5.817	0.12	0.14	0.003	0					0.11
5.833	0.12	0.14	0.003	0					0.11
5.850	0.12	0.14	0.003	0					0.11
5.867	0.12	0.14	0.003	0					0.11
5.883	0.12	0.14	0.003	0					0.11
5.900	0.12	0.14	0.003	0					0.10
5.917	0.12	0.13	0.003	0					0.10
5.933	0.12	0.13	0.003	0					0.10
5.950	0.12	0.13	0.003	0					0.10
5.967	0.11	0.13	0.003	0					0.10
5.983	0.11	0.13	0.003	0					0.10
6.000	0.11	0.13	0.003	0					0.10
6.017	0.11	0.13	0.003	0					0.10
6.033	0.11	0.13	0.003	0					0.10
6.050	0.11	0.13	0.003	0					0.10
6.067	0.11	0.13	0.003	0					0.10
6.083	0.11	0.12	0.003	0					0.10
6.100	0.11	0.12	0.003	0					0.09
6.117	0.11	0.12	0.003	0					0.09
6.133	0.11	0.12	0.003	0					0.09
6.150	0.11	0.12	0.003	0					0.09
6.167	0.00	0.12	0.003	IO					0.09
6.183	0.00	0.11	0.002	IO					0.08
6.200	0.00	0.10	0.002	IO					0.08
6.217	0.00	0.10	0.002	0					0.07
6.233	0.00	0.09	0.002	0					0.07
6.250	0.00	0.08	0.002	0					0.07
6.267	0.00	0.08	0.002	0					0.06
6.283	0.00	0.07	0.002	0					0.06
6.300	0.00	0.07	0.002	0					0.05

PR3ANORTHDET									
6.317	0.00	0.07	0.001	0					0.05
6.333	0.00	0.06	0.001	0					0.05
6.350	0.00	0.06	0.001	0					0.04
6.367	0.00	0.05	0.001	0					0.04
6.383	0.00	0.05	0.001	0					0.04
6.400	0.00	0.05	0.001	0					0.04
6.417	0.00	0.04	0.001	0					0.03
6.433	0.00	0.04	0.001	0					0.03
6.450	0.00	0.04	0.001	0					0.03
6.467	0.00	0.04	0.001	0					0.03
6.483	0.00	0.03	0.001	0					0.03
6.500	0.00	0.03	0.001	0					0.02
6.517	0.00	0.03	0.001	0					0.02
6.533	0.00	0.03	0.001	0					0.02
6.550	0.00	0.03	0.001	0					0.02
6.567	0.00	0.03	0.001	0					0.02
6.583	0.00	0.02	0.001	0					0.02
6.600	0.00	0.02	0.000	0					0.02
6.617	0.00	0.02	0.000	0					0.02
6.633	0.00	0.02	0.000	0					0.01
6.650	0.00	0.02	0.000	0					0.01
6.667	0.00	0.02	0.000	0					0.01
6.683	0.00	0.02	0.000	0					0.01
6.700	0.00	0.02	0.000	0					0.01
6.717	0.00	0.01	0.000	0					0.01
6.733	0.00	0.01	0.000	0					0.01
6.750	0.00	0.01	0.000	0					0.01
6.767	0.00	0.01	0.000	0					0.01
6.783	0.00	0.01	0.000	0					0.01
6.800	0.00	0.01	0.000	0					0.01
6.817	0.00	0.01	0.000	0					0.01
6.833	0.00	0.01	0.000	0					0.01
6.850	0.00	0.01	0.000	0					0.01
6.867	0.00	0.01	0.000	0					0.01
6.883	0.00	0.01	0.000	0					0.01
6.900	0.00	0.01	0.000	0					0.01
6.917	0.00	0.01	0.000	0					0.01
6.933	0.00	0.01	0.000	0					0.00
6.950	0.00	0.01	0.000	0					0.00
6.967	0.00	0.01	0.000	0					0.00
6.983	0.00	0.01	0.000	0					0.00
7.000	0.00	0.00	0.000	0					0.00
7.017	0.00	0.00	0.000	0					0.00
7.033	0.00	0.00	0.000	0					0.00
7.050	0.00	0.00	0.000	0					0.00
7.067	0.00	0.00	0.000	0					0.00
7.083	0.00	0.00	0.000	0					0.00
7.100	0.00	0.00	0.000	0					0.00
7.117	0.00	0.00	0.000	0					0.00
7.133	0.00	0.00	0.000	0					0.00
7.150	0.00	0.00	0.000	0					0.00
7.167	0.00	0.00	0.000	0					0.00
7.183	0.00	0.00	0.000	0					0.00
7.200	0.00	0.00	0.000	0					0.00
7.217	0.00	0.00	0.000	0					0.00
7.233	0.00	0.00	0.000	0					0.00
7.250	0.00	0.00	0.000	0					0.00
7.267	0.00	0.00	0.000	0					0.00
7.283	0.00	0.00	0.000	0					0.00
7.300	0.00	0.00	0.000	0					0.00
7.317	0.00	0.00	0.000	0					0.00
7.333	0.00	0.00	0.000	0					0.00
7.350	0.00	0.00	0.000	0					0.00

PR3ANORTHDET

*****HYDROGRAPH DATA*****
Number of intervals = 441
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 2.225 (CFS)
Total volume = 0.148 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

PR3ANORTHROUTE

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
Rainfall intensity (I) = 4.056(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 12.64 min. Rain intensity = 4.06(In/Hr)
Total area = 1.547(Ac.) Total runoff = 2.225(CFS)

+++++
Process from Point/Station 303.000 to Point/Station 306.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 381.000(Ft.)
Downstream point/station elevation = 373.120(Ft.)
Pipe length = 155.00(Ft.) Slope = 0.0508 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.225(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 2.225(CFS)
Normal flow depth in pipe = 4.32(In.)
Flow top width inside pipe = 11.52(In.)
Critical Depth = 7.66(In.)
Pipe flow velocity = 8.75(Ft/s)
Travel time through pipe = 0.30 min.
Time of concentration (TC) = 12.94 min.
End of computations, total study area = 1.547 (Ac.)

PR4ANORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 360.000(Ft.)
Highest elevation = 385.000(Ft.)
Lowest elevation = 381.100(Ft.)
Elevation difference = 3.900(Ft.) Slope = 1.083 %
Top of Initial Area Slope adjusted by User to 1.575 %
Bottom of Initial Area Slope adjusted by User to 1.575 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.58 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 9.13 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4600) * (85.000^{.5}) / (1.575^{(1/3)})] = 9.13$
The initial area total distance of 360.00 (Ft.) entered leaves a
remaining distance of 275.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 2.92 minutes
for a distance of 275.00 (Ft.) and a slope of 1.58 %
with an elevation difference of 4.33(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 2.917 Minutes
 $Tt = [(11.9 * 0.0521^3) / (4.33)]^{.385} = 2.92$
Total initial area Ti = 9.13 minutes from Figure 3-3 formula plus
2.92 minutes from the Figure 3-4 formula = 12.05 minutes

PR4ANORTH
 Rainfall intensity (I) = 4.184(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.460
 Subarea runoff = 1.544(CFS)
 Total initial stream area = 0.802(Ac.)

+++++
 Process from Point/Station 402.000 to Point/Station 404.000
 ***** PIPEFLOW TRAVEL TIME (User specified size) *****

Upstream point/station elevation = 373.600(Ft.)
 Downstream point/station elevation = 367.200(Ft.)
 Pipe length = 75.00(Ft.) Slope = 0.0853 Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 1.544(CFS)
 Given pipe size = 12.00(In.)
 Calculated individual pipe flow = 1.544(CFS)
 Normal flow depth in pipe = 3.12(In.)
 Flow top width inside pipe = 10.53(In.)
 Critical Depth = 6.33(In.)
 Pipe flow velocity = 9.50(Ft/s)
 Travel time through pipe = 0.13 min.
 Time of concentration (TC) = 12.18 min.
 End of computations, total study area = 0.802 (Ac.)

Detention Design

Pipe:

diameter 6 inches 0.50 ft
coefficient 0.013

$$Q = C_o A_o \sqrt{2g(H_o)} \quad (6-12)$$

where ...

Q = orifice flow discharge (ft³/s);
 C_o = orifice discharge coefficient;
 A_o = cross-sectional area of flow through the orifice (ft²);
 g = gravitational acceleration (32.2 ft/s²);
 H_o = effective head above orifice (ft); and

San Diego County Drainage Design Manual
July 2005

Page 6-11

C_o = 0.60 from Table 6.1 County Drainage Design Manual
 A_o = 0.20 sf
 g = 32.20 sf/sec
 C = 2.90

Stage	Depth (ft)	Effective Head (Ho)	Volume (cf)	Area (Ac.ft)	Orifice Flow (cfs)
380.10	0.00	0.00	0	0.000	0.00
380.60	0.50	0.25	603	0.014	0.47
381.10	1.00	0.75	1205	0.028	0.82

Hydrology Parameters

Before Detention
 Q = 1.544 cfs
 A = 0.802 Acre
 T_c = 9.13 min.
 C = 0.460
 I = 4.700 in/hr

After Detention
 Δt = 8.00 min.
 Q = 0.696 cfs
 A = 0.802 Acre
 T_c = 17.13 min.

PR4ANORTHHYD

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.0 DU/A or Less)
Impervious value, Ai = 0.200
Sub-Area C Value = 0.460
Initial subarea total flow distance = 360.000(Ft.)
Highest elevation = 385.000(Ft.)
Lowest elevation = 381.100(Ft.)
Elevation difference = 3.900(Ft.) Slope = 1.083 %
Top of Initial Area Slope adjusted by User to 1.575 %
Bottom of Initial Area Slope adjusted by User to 1.575 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.58 %, in a development type of
2.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 9.13 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4600) * (85.000^{.5}) / (1.575^{(1/3)})] = 9.13$
The initial area total distance of 360.00 (Ft.) entered leaves a
remaining distance of 275.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 2.92 minutes
for a distance of 275.00 (Ft.) and a slope of 1.58 %
with an elevation difference of 4.33(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 2.917 Minutes
 $Tt = [(11.9 * 0.0521^3) / (4.33)]^{.385} = 2.92$
Total initial area Ti = 9.13 minutes from Figure 3-3 formula plus
2.92 minutes from the Figure 3-4 formula = 12.05 minutes

PR4ANORTHHYD
 Rainfall intensity (I) = 4.184(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.460
 Subarea runoff = 1.544(CFS)
 Total initial stream area = 0.802(Ac.)

+++++
 Process from Point/Station 402.000 to Point/Station 404.000
 ***** 6 HOUR HYDROGRAPH *****

+++++
 Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 12.05
 Basin Area = 0.80 Acres
 6 Hour Rainfall = 2.800 Inches
 Runoff Coefficient = 0.460
 Peak Discharge = 1.54 CFS

Time (Min)	Discharge (CFS)
0	0.000
12	0.062
24	0.063
36	0.066
48	0.068
60	0.072
72	0.074
84	0.078
96	0.081
108	0.087
120	0.090
132	0.098
144	0.103
156	0.114
168	0.121
180	0.138
192	0.150
204	0.183
216	0.209
228	0.306
240	0.432
252	1.544
264	0.246
276	0.164
288	0.129
300	0.108
312	0.094
324	0.084
336	0.076
348	0.070
360	0.065
372	0.061

+++++
 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 1 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	0.4	0.8	1.2	1.5
0+ 0	0.0000	0.00	Q				
0+ 1	0.0000	0.01	Q				

PR4ANORTHHYD

0+ 2	0.0000	0.01	Q
0+ 3	0.0000	0.02	Q
0+ 4	0.0001	0.02	Q
0+ 5	0.0001	0.03	Q
0+ 6	0.0001	0.03	Q
0+ 7	0.0002	0.04	Q
0+ 8	0.0003	0.04	VQ
0+ 9	0.0003	0.05	VQ
0+10	0.0004	0.05	VQ
0+11	0.0005	0.06	VQ
0+12	0.0006	0.06	VQ
0+13	0.0006	0.06	VQ
0+14	0.0007	0.06	VQ
0+15	0.0008	0.06	VQ
0+16	0.0009	0.06	VQ
0+17	0.0010	0.06	VQ
0+18	0.0011	0.06	VQ
0+19	0.0012	0.06	VQ
0+20	0.0012	0.06	VQ
0+21	0.0013	0.06	VQ
0+22	0.0014	0.06	VQ
0+23	0.0015	0.06	VQ
0+24	0.0016	0.06	VQ
0+25	0.0017	0.06	VQ
0+26	0.0018	0.06	VQ
0+27	0.0019	0.06	VQ
0+28	0.0019	0.06	VQ
0+29	0.0020	0.06	VQ
0+30	0.0021	0.06	VQ
0+31	0.0022	0.07	Q
0+32	0.0023	0.07	Q
0+33	0.0024	0.07	Q
0+34	0.0025	0.07	Q
0+35	0.0026	0.07	Q
0+36	0.0027	0.07	Q
0+37	0.0028	0.07	Q
0+38	0.0028	0.07	Q
0+39	0.0029	0.07	Q
0+40	0.0030	0.07	Q
0+41	0.0031	0.07	Q
0+42	0.0032	0.07	Q
0+43	0.0033	0.07	Q
0+44	0.0034	0.07	Q
0+45	0.0035	0.07	Q
0+46	0.0036	0.07	Q
0+47	0.0037	0.07	Q
0+48	0.0038	0.07	Q
0+49	0.0039	0.07	Q
0+50	0.0040	0.07	Q
0+51	0.0041	0.07	Q
0+52	0.0042	0.07	Q
0+53	0.0043	0.07	Q
0+54	0.0043	0.07	QV
0+55	0.0044	0.07	QV
0+56	0.0045	0.07	QV
0+57	0.0046	0.07	QV
0+58	0.0047	0.07	QV
0+59	0.0048	0.07	QV
1+ 0	0.0049	0.07	QV
1+ 1	0.0050	0.07	QV
1+ 2	0.0051	0.07	QV
1+ 3	0.0052	0.07	QV
1+ 4	0.0053	0.07	QV

PR4ANORTHHYD

1+ 5	0.0054	0.07	QV
1+ 6	0.0055	0.07	QV
1+ 7	0.0056	0.07	QV
1+ 8	0.0057	0.07	QV
1+ 9	0.0058	0.07	QV
1+10	0.0059	0.07	QV
1+11	0.0060	0.07	QV
1+12	0.0061	0.07	QV
1+13	0.0062	0.07	QV
1+14	0.0063	0.07	QV
1+15	0.0064	0.07	QV
1+16	0.0065	0.08	Q V
1+17	0.0067	0.08	Q V
1+18	0.0068	0.08	Q V
1+19	0.0069	0.08	Q V
1+20	0.0070	0.08	Q V
1+21	0.0071	0.08	Q V
1+22	0.0072	0.08	QV
1+23	0.0073	0.08	QV
1+24	0.0074	0.08	QV
1+25	0.0075	0.08	QV
1+26	0.0076	0.08	QV
1+27	0.0077	0.08	QV
1+28	0.0078	0.08	QV
1+29	0.0079	0.08	QV
1+30	0.0080	0.08	QV
1+31	0.0082	0.08	QV
1+32	0.0083	0.08	QV
1+33	0.0084	0.08	QV
1+34	0.0085	0.08	QV
1+35	0.0086	0.08	QV
1+36	0.0087	0.08	Q V
1+37	0.0088	0.08	Q V
1+38	0.0089	0.08	Q V
1+39	0.0091	0.08	Q V
1+40	0.0092	0.08	Q V
1+41	0.0093	0.08	Q V
1+42	0.0094	0.08	Q V
1+43	0.0095	0.08	Q V
1+44	0.0096	0.08	Q V
1+45	0.0097	0.09	Q V
1+46	0.0099	0.09	Q V
1+47	0.0100	0.09	Q V
1+48	0.0101	0.09	Q V
1+49	0.0102	0.09	Q V
1+50	0.0103	0.09	Q V
1+51	0.0105	0.09	Q V
1+52	0.0106	0.09	Q V
1+53	0.0107	0.09	Q V
1+54	0.0108	0.09	Q V
1+55	0.0109	0.09	Q V
1+56	0.0111	0.09	Q V
1+57	0.0112	0.09	Q V
1+58	0.0113	0.09	Q V
1+59	0.0114	0.09	Q V
2+ 0	0.0116	0.09	Q V
2+ 1	0.0117	0.09	Q V
2+ 2	0.0118	0.09	Q V
2+ 3	0.0119	0.09	Q V
2+ 4	0.0121	0.09	Q V
2+ 5	0.0122	0.09	Q V
2+ 6	0.0123	0.09	Q V
2+ 7	0.0125	0.09	Q V

PR4ANORTHHYD

2+ 8	0.0126	0.10	Q	V			
2+ 9	0.0127	0.10	Q	V			
2+10	0.0129	0.10	Q	V			
2+11	0.0130	0.10	Q	V			
2+12	0.0131	0.10	Q	V			
2+13	0.0133	0.10	Q	V			
2+14	0.0134	0.10	Q	V			
2+15	0.0135	0.10	Q	V			
2+16	0.0137	0.10	Q	V			
2+17	0.0138	0.10	Q	V			
2+18	0.0139	0.10	Q	V			
2+19	0.0141	0.10	Q	V			
2+20	0.0142	0.10	Q	V			
2+21	0.0144	0.10	Q	V			
2+22	0.0145	0.10	Q	V			
2+23	0.0146	0.10	Q	V			
2+24	0.0148	0.10	Q	V			
2+25	0.0149	0.10	Q	V			
2+26	0.0151	0.10	Q	V			
2+27	0.0152	0.11	Q	V			
2+28	0.0154	0.11	Q	V			
2+29	0.0155	0.11	Q	V			
2+30	0.0157	0.11	Q	V			
2+31	0.0158	0.11	Q	V			
2+32	0.0160	0.11	Q	V			
2+33	0.0161	0.11	Q	V			
2+34	0.0163	0.11	Q	V			
2+35	0.0164	0.11	Q	V			
2+36	0.0166	0.11	Q	V			
2+37	0.0167	0.11	Q	V			
2+38	0.0169	0.11	Q	V			
2+39	0.0171	0.12	Q	V			
2+40	0.0172	0.12	Q	V			
2+41	0.0174	0.12	Q	V			
2+42	0.0175	0.12	Q	V			
2+43	0.0177	0.12	Q	V			
2+44	0.0179	0.12	Q	V			
2+45	0.0180	0.12	Q	V			
2+46	0.0182	0.12	Q	V			
2+47	0.0184	0.12	Q	V			
2+48	0.0185	0.12	Q	V			
2+49	0.0187	0.12	Q	V			
2+50	0.0189	0.12	Q	V			
2+51	0.0190	0.13	Q	V			
2+52	0.0192	0.13	Q	V			
2+53	0.0194	0.13	Q	V			
2+54	0.0196	0.13	Q	V			
2+55	0.0197	0.13	Q	V			
2+56	0.0199	0.13	Q	V			
2+57	0.0201	0.13	Q	V			
2+58	0.0203	0.14	Q	V			
2+59	0.0205	0.14	Q	V			
3+ 0	0.0207	0.14	Q	V			
3+ 1	0.0209	0.14	Q	V			
3+ 2	0.0211	0.14	Q	V			
3+ 3	0.0213	0.14	Q	V			
3+ 4	0.0214	0.14	Q	V			
3+ 5	0.0216	0.14	Q	V			
3+ 6	0.0218	0.14	Q	V			
3+ 7	0.0220	0.15	Q	V			
3+ 8	0.0222	0.15	Q	V			
3+ 9	0.0224	0.15	Q	V			
3+10	0.0226	0.15	Q	V			

			PR4ANORTHHYD			
3+11	0.0229	0.15	Q	V		
3+12	0.0231	0.15	Q	V		
3+13	0.0233	0.15	Q	V		
3+14	0.0235	0.16	Q	V		
3+15	0.0237	0.16	Q	V		
3+16	0.0239	0.16	Q	V		
3+17	0.0242	0.16	Q	V		
3+18	0.0244	0.17	Q	V		
3+19	0.0246	0.17	Q	V		
3+20	0.0249	0.17	Q	V		
3+21	0.0251	0.17	Q	V		
3+22	0.0253	0.18	Q	V		
3+23	0.0256	0.18	Q	V		
3+24	0.0258	0.18	Q	V		
3+25	0.0261	0.19	Q	V		
3+26	0.0263	0.19	Q	V		
3+27	0.0266	0.19	Q	V		
3+28	0.0269	0.19	Q	V		
3+29	0.0271	0.19	Q	V		
3+30	0.0274	0.20	Q	V		
3+31	0.0277	0.20	Q	V		
3+32	0.0280	0.20	Q	V		
3+33	0.0282	0.20	Q	V		
3+34	0.0285	0.20	Q	V		
3+35	0.0288	0.21	Q	V		
3+36	0.0291	0.21	Q	V		
3+37	0.0294	0.22	Q	V		
3+38	0.0297	0.22	Q	V		
3+39	0.0300	0.23	Q	V		
3+40	0.0304	0.24	Q	V		
3+41	0.0307	0.25	Q	V		
3+42	0.0311	0.26	Q	V		
3+43	0.0314	0.27	Q	V		
3+44	0.0318	0.27	Q	V		
3+45	0.0322	0.28	Q	V		
3+46	0.0326	0.29	Q	V		
3+47	0.0330	0.30	Q	V		
3+48	0.0334	0.31	Q	V		
3+49	0.0339	0.32	Q	V		
3+50	0.0343	0.33	Q	V		
3+51	0.0348	0.34	Q	V		
3+52	0.0352	0.35	Q	V		
3+53	0.0357	0.36	Q	V		
3+54	0.0363	0.37	Q	V		
3+55	0.0368	0.38	Q	V		
3+56	0.0373	0.39	Q	V		
3+57	0.0379	0.40	Q	V		
3+58	0.0384	0.41	Q	V		
3+59	0.0390	0.42	Q	V		
4+ 0	0.0396	0.43	Q	V		
4+ 1	0.0403	0.52	Q	V		
4+ 2	0.0412	0.62	Q	V		
4+ 3	0.0422	0.71	Q	V		
4+ 4	0.0433	0.80	Q	V		
4+ 5	0.0445	0.89	Q	V		
4+ 6	0.0459	0.99	Q	V		
4+ 7	0.0473	1.08	Q	V		
4+ 8	0.0490	1.17	Q	V		
4+ 9	0.0507	1.27	Q	V		
4+10	0.0526	1.36	Q	V		
4+11	0.0546	1.45	Q	V		
4+12	0.0567	1.54	Q	V		
4+13	0.0587	1.44	Q	V		

			PR4ANORTHHYD			
4+14	0.0605	1.33				V
4+15	0.0622	1.22				V
4+16	0.0637	1.11				Q
4+17	0.0651	1.00				Q
4+18	0.0663	0.89			Q	V
4+19	0.0674	0.79			Q	V
4+20	0.0683	0.68		Q		V
4+21	0.0691	0.57		Q		V
4+22	0.0698	0.46		Q		V
4+23	0.0702	0.35	Q			V
4+24	0.0706	0.25		Q		V
4+25	0.0709	0.24		Q		V
4+26	0.0712	0.23		Q		V
4+27	0.0715	0.23		Q		V
4+28	0.0718	0.22		Q		V
4+29	0.0721	0.21		Q		V
4+30	0.0724	0.21		Q		V
4+31	0.0727	0.20		Q		V
4+32	0.0730	0.19		Q		V
4+33	0.0732	0.18		Q		V
4+34	0.0735	0.18		Q		V
4+35	0.0737	0.17		Q		V
4+36	0.0739	0.16		Q		V
4+37	0.0741	0.16		Q		V
4+38	0.0744	0.16		Q		V
4+39	0.0746	0.16		Q		V
4+40	0.0748	0.15		Q		V
4+41	0.0750	0.15		Q		V
4+42	0.0752	0.15		Q		V
4+43	0.0754	0.14		Q		V
4+44	0.0756	0.14		Q		V
4+45	0.0758	0.14		Q		V
4+46	0.0760	0.13		Q		V
4+47	0.0761	0.13		Q		V
4+48	0.0763	0.13		Q		V
4+49	0.0765	0.13		Q		V
4+50	0.0767	0.13		Q		V
4+51	0.0768	0.12		Q		V
4+52	0.0770	0.12		Q		V
4+53	0.0772	0.12		Q		V
4+54	0.0773	0.12		Q		V
4+55	0.0775	0.12		Q		V
4+56	0.0776	0.11	Q			V
4+57	0.0778	0.11	Q			V
4+58	0.0780	0.11	Q			V
4+59	0.0781	0.11	Q			V
5+ 0	0.0783	0.11	Q			V
5+ 1	0.0784	0.11	Q			V
5+ 2	0.0785	0.11	Q			V
5+ 3	0.0787	0.10	Q			V
5+ 4	0.0788	0.10	Q			V
5+ 5	0.0790	0.10	Q			V
5+ 6	0.0791	0.10	Q			V
5+ 7	0.0793	0.10	Q			V
5+ 8	0.0794	0.10	Q			V
5+ 9	0.0795	0.10	Q			V
5+10	0.0797	0.10	Q			V
5+11	0.0798	0.09	Q			V
5+12	0.0799	0.09	Q			V
5+13	0.0800	0.09	Q			V
5+14	0.0802	0.09	Q			V
5+15	0.0803	0.09	Q			V
5+16	0.0804	0.09	Q			V

PR4ANORTHHYD

5+17	0.0805	0.09	Q				V
5+18	0.0807	0.09	Q				V
5+19	0.0808	0.09	Q				V
5+20	0.0809	0.09	Q				V
5+21	0.0810	0.09	Q				V
5+22	0.0811	0.09	Q				V
5+23	0.0813	0.08	Q				V
5+24	0.0814	0.08	Q				V
5+25	0.0815	0.08	Q				V
5+26	0.0816	0.08	Q				V
5+27	0.0817	0.08	Q				V
5+28	0.0818	0.08	Q				V
5+29	0.0819	0.08	Q				V
5+30	0.0820	0.08	Q				V
5+31	0.0822	0.08	Q				V
5+32	0.0823	0.08	Q				V
5+33	0.0824	0.08	Q				V
5+34	0.0825	0.08	Q				V
5+35	0.0826	0.08	Q				V
5+36	0.0827	0.08	Q				V
5+37	0.0828	0.08	Q				V
5+38	0.0829	0.07	Q				V
5+39	0.0830	0.07	Q				V
5+40	0.0831	0.07	Q				V
5+41	0.0832	0.07	Q				V
5+42	0.0833	0.07	Q				V
5+43	0.0834	0.07	Q				V
5+44	0.0835	0.07	Q				V
5+45	0.0836	0.07	Q				V
5+46	0.0837	0.07	Q				V
5+47	0.0838	0.07	Q				V
5+48	0.0839	0.07	Q				V
5+49	0.0840	0.07	Q				V
5+50	0.0841	0.07	Q				V
5+51	0.0842	0.07	Q				V
5+52	0.0843	0.07	Q				V
5+53	0.0844	0.07	Q				V
5+54	0.0845	0.07	Q				V
5+55	0.0845	0.07	Q				V
5+56	0.0846	0.07	Q				V
5+57	0.0847	0.07	Q				V
5+58	0.0848	0.07	Q				V
5+59	0.0849	0.07	Q				V
6+ 0	0.0850	0.06	Q				V
6+ 1	0.0851	0.06	Q				V
6+ 2	0.0852	0.06	Q				V
6+ 3	0.0853	0.06	Q				V
6+ 4	0.0853	0.06	Q				V
6+ 5	0.0854	0.06	Q				V
6+ 6	0.0855	0.06	Q				V
6+ 7	0.0856	0.06	Q				V
6+ 8	0.0857	0.06	Q				V
6+ 9	0.0858	0.06	Q				V
6+10	0.0859	0.06	Q				V
6+11	0.0859	0.06	Q				V
6+12	0.0860	0.06	Q				V

End of computations, total study area =

0.802 (Ac.)

PR4ANORTHDET

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
Study date: 05/01/17

Program License Serial Number 6313

***** HYDROGRAPH INFORMATION *****

From study/file name: PR4ANORTHHYD.rte
*****HYDROGRAPH DATA*****
Number of intervals = 372
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 1.544 (CFS)
Total volume = 0.086 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

+++++
Process from Point/Station 401.000 to Point/Station 402.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 372
Hydrograph time unit = 1.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:
Basin Depth Storage Outflow (S-0*dt/2) (S+0*dt/2)
(Ft.) (Ac.Ft) (CFS) (Ac.Ft) (Ac.Ft)

0.000 0.000 0.000 0.000 0.000
0.500 0.014 0.470 0.014 0.014
1.000 0.028 0.820 0.027 0.029

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	0	0.4	0.77	1.16	1.54 (Ft.)

PR4ANORTHDET									
0.017	0.01	0.00	0.000	0					0.00
0.033	0.01	0.00	0.000	0					0.00
0.050	0.02	0.00	0.000	0					0.00
0.067	0.02	0.00	0.000	0					0.00
0.083	0.03	0.00	0.000	0					0.00
0.100	0.03	0.00	0.000	0					0.00
0.117	0.04	0.01	0.000	0					0.01
0.133	0.04	0.01	0.000	0					0.01
0.150	0.05	0.01	0.000	0					0.01
0.167	0.05	0.01	0.000	OI					0.01
0.183	0.06	0.01	0.000	OI					0.01
0.200	0.06	0.01	0.000	OI					0.02
0.217	0.06	0.02	0.000	OI					0.02
0.233	0.06	0.02	0.001	OI					0.02
0.250	0.06	0.02	0.001	OI					0.02
0.267	0.06	0.02	0.001	OI					0.02
0.283	0.06	0.02	0.001	OI					0.03
0.300	0.06	0.03	0.001	OI					0.03
0.317	0.06	0.03	0.001	OI					0.03
0.333	0.06	0.03	0.001	OI					0.03
0.350	0.06	0.03	0.001	OI					0.03
0.367	0.06	0.03	0.001	OI					0.03
0.383	0.06	0.03	0.001	OI					0.04
0.400	0.06	0.03	0.001	OI					0.04
0.417	0.06	0.04	0.001	OI					0.04
0.433	0.06	0.04	0.001	OI					0.04
0.450	0.06	0.04	0.001	OI					0.04
0.467	0.06	0.04	0.001	OI					0.04
0.483	0.06	0.04	0.001	OI					0.04
0.500	0.06	0.04	0.001	OI					0.04
0.517	0.07	0.04	0.001	OI					0.05
0.533	0.07	0.04	0.001	OI					0.05
0.550	0.07	0.05	0.001	OI					0.05
0.567	0.07	0.05	0.001	OI					0.05
0.583	0.07	0.05	0.001	OI					0.05
0.600	0.07	0.05	0.001	OI					0.05
0.617	0.07	0.05	0.001	0					0.05
0.633	0.07	0.05	0.001	0					0.05
0.650	0.07	0.05	0.001	0					0.05
0.667	0.07	0.05	0.002	0					0.05
0.683	0.07	0.05	0.002	0					0.05
0.700	0.07	0.05	0.002	0					0.06
0.717	0.07	0.05	0.002	0					0.06
0.733	0.07	0.05	0.002	0					0.06
0.750	0.07	0.05	0.002	0					0.06
0.767	0.07	0.05	0.002	0					0.06
0.783	0.07	0.06	0.002	0					0.06
0.800	0.07	0.06	0.002	0					0.06
0.817	0.07	0.06	0.002	0					0.06
0.833	0.07	0.06	0.002	0					0.06
0.850	0.07	0.06	0.002	0					0.06
0.867	0.07	0.06	0.002	0					0.06
0.883	0.07	0.06	0.002	0					0.06
0.900	0.07	0.06	0.002	0					0.06
0.917	0.07	0.06	0.002	0					0.06
0.933	0.07	0.06	0.002	0					0.06
0.950	0.07	0.06	0.002	0					0.06
0.967	0.07	0.06	0.002	0					0.06
0.983	0.07	0.06	0.002	0					0.07
1.000	0.07	0.06	0.002	0					0.07
1.017	0.07	0.06	0.002	0					0.07
1.033	0.07	0.06	0.002	0					0.07
1.050	0.07	0.06	0.002	0					0.07

PR4ANORTHDET

1.067	0.07	0.06	0.002	0					0.07
1.083	0.07	0.06	0.002	0					0.07
1.100	0.07	0.06	0.002	0					0.07
1.117	0.07	0.06	0.002	0					0.07
1.133	0.07	0.07	0.002	0					0.07
1.150	0.07	0.07	0.002	0					0.07
1.167	0.07	0.07	0.002	0					0.07
1.183	0.07	0.07	0.002	0					0.07
1.200	0.07	0.07	0.002	0					0.07
1.217	0.07	0.07	0.002	0					0.07
1.233	0.07	0.07	0.002	0					0.07
1.250	0.07	0.07	0.002	0					0.07
1.267	0.08	0.07	0.002	0					0.07
1.283	0.08	0.07	0.002	0					0.07
1.300	0.08	0.07	0.002	0					0.07
1.317	0.08	0.07	0.002	0					0.07
1.333	0.08	0.07	0.002	0					0.07
1.350	0.08	0.07	0.002	0					0.07
1.367	0.08	0.07	0.002	0					0.07
1.383	0.08	0.07	0.002	0					0.07
1.400	0.08	0.07	0.002	0					0.08
1.417	0.08	0.07	0.002	0					0.08
1.433	0.08	0.07	0.002	0					0.08
1.450	0.08	0.07	0.002	0					0.08
1.467	0.08	0.07	0.002	0					0.08
1.483	0.08	0.07	0.002	0					0.08
1.500	0.08	0.07	0.002	0					0.08
1.517	0.08	0.07	0.002	0					0.08
1.533	0.08	0.07	0.002	0					0.08
1.550	0.08	0.07	0.002	0					0.08
1.567	0.08	0.07	0.002	0					0.08
1.583	0.08	0.07	0.002	0					0.08
1.600	0.08	0.07	0.002	0					0.08
1.617	0.08	0.07	0.002	0					0.08
1.633	0.08	0.08	0.002	0					0.08
1.650	0.08	0.08	0.002	0					0.08
1.667	0.08	0.08	0.002	0					0.08
1.683	0.08	0.08	0.002	0					0.08
1.700	0.08	0.08	0.002	0					0.08
1.717	0.08	0.08	0.002	0					0.08
1.733	0.08	0.08	0.002	0					0.08
1.750	0.09	0.08	0.002	0					0.08
1.767	0.09	0.08	0.002	0					0.08
1.783	0.09	0.08	0.002	0					0.08
1.800	0.09	0.08	0.002	0					0.08
1.817	0.09	0.08	0.002	0					0.08
1.833	0.09	0.08	0.002	0					0.08
1.850	0.09	0.08	0.002	0					0.08
1.867	0.09	0.08	0.002	0					0.09
1.883	0.09	0.08	0.002	0					0.09
1.900	0.09	0.08	0.002	0					0.09
1.917	0.09	0.08	0.002	0					0.09
1.933	0.09	0.08	0.002	0					0.09
1.950	0.09	0.08	0.002	0					0.09
1.967	0.09	0.08	0.002	0					0.09
1.983	0.09	0.08	0.002	0					0.09
2.000	0.09	0.08	0.002	0					0.09
2.017	0.09	0.08	0.002	0					0.09
2.033	0.09	0.08	0.002	0					0.09
2.050	0.09	0.08	0.002	0					0.09
2.067	0.09	0.08	0.003	0					0.09
2.083	0.09	0.08	0.003	0					0.09
2.100	0.09	0.09	0.003	0					0.09

PR4ANORTHDET

2.117	0.09	0.09	0.003	0				0.09
2.133	0.10	0.09	0.003	0				0.09
2.150	0.10	0.09	0.003	0				0.09
2.167	0.10	0.09	0.003	OI				0.09
2.183	0.10	0.09	0.003	OI				0.09
2.200	0.10	0.09	0.003	OI				0.09
2.217	0.10	0.09	0.003	OI				0.09
2.233	0.10	0.09	0.003	OI				0.09
2.250	0.10	0.09	0.003	OI				0.09
2.267	0.10	0.09	0.003	OI				0.10
2.283	0.10	0.09	0.003	OI				0.10
2.300	0.10	0.09	0.003	OI				0.10
2.317	0.10	0.09	0.003	OI				0.10
2.333	0.10	0.09	0.003	OI				0.10
2.350	0.10	0.09	0.003	OI				0.10
2.367	0.10	0.09	0.003	OI				0.10
2.383	0.10	0.09	0.003	OI				0.10
2.400	0.10	0.09	0.003	OI				0.10
2.417	0.10	0.09	0.003	OI				0.10
2.433	0.10	0.09	0.003	OI				0.10
2.450	0.11	0.09	0.003	OI				0.10
2.467	0.11	0.10	0.003	OI				0.10
2.483	0.11	0.10	0.003	OI				0.10
2.500	0.11	0.10	0.003	OI				0.10
2.517	0.11	0.10	0.003	0				0.10
2.533	0.11	0.10	0.003	0				0.10
2.550	0.11	0.10	0.003	0				0.10
2.567	0.11	0.10	0.003	0				0.10
2.583	0.11	0.10	0.003	0				0.11
2.600	0.11	0.10	0.003	0				0.11
2.617	0.11	0.10	0.003	0				0.11
2.633	0.11	0.10	0.003	0				0.11
2.650	0.12	0.10	0.003	0				0.11
2.667	0.12	0.10	0.003	0				0.11
2.683	0.12	0.10	0.003	0				0.11
2.700	0.12	0.10	0.003	0				0.11
2.717	0.12	0.10	0.003	0				0.11
2.733	0.12	0.10	0.003	0				0.11
2.750	0.12	0.11	0.003	0				0.11
2.767	0.12	0.11	0.003	0				0.11
2.783	0.12	0.11	0.003	0				0.11
2.800	0.12	0.11	0.003	0				0.11
2.817	0.12	0.11	0.003	0				0.11
2.833	0.12	0.11	0.003	0				0.12
2.850	0.13	0.11	0.003	0				0.12
2.867	0.13	0.11	0.003	0				0.12
2.883	0.13	0.11	0.003	0				0.12
2.900	0.13	0.11	0.003	0				0.12
2.917	0.13	0.11	0.003	0				0.12
2.933	0.13	0.11	0.003	0				0.12
2.950	0.13	0.11	0.003	0				0.12
2.967	0.14	0.12	0.003	0				0.12
2.983	0.14	0.12	0.003	0				0.12
3.000	0.14	0.12	0.003	0				0.12
3.017	0.14	0.12	0.004	0				0.13
3.033	0.14	0.12	0.004	0				0.13
3.050	0.14	0.12	0.004	0				0.13
3.067	0.14	0.12	0.004	0				0.13
3.083	0.14	0.12	0.004	0				0.13
3.100	0.14	0.12	0.004	0				0.13
3.117	0.15	0.12	0.004	OI				0.13
3.133	0.15	0.12	0.004	OI				0.13
3.150	0.15	0.13	0.004	OI				0.13

PR4AN0RTHDET

[illegible]

				PR4ANORTHDET							
4.217	1.44	0.60	0.019			0				I	0.69
4.233	1.33	0.63	0.020			0				I	0.73
4.250	1.22	0.65	0.021			0				I	0.76
4.267	1.11	0.67	0.022			0			I		0.78
4.283	1.00	0.68	0.022			0		I			0.80
4.300	0.89	0.69	0.023			0		I			0.81
4.317	0.79	0.69	0.023			0	I				0.82
4.333	0.68	0.70	0.023			0					0.82
4.350	0.57	0.69	0.023			I	0				0.82
4.367	0.46	0.69	0.023			I	0				0.81
4.383	0.35	0.68	0.022		I	0					0.80
4.400	0.25	0.67	0.022		I	0					0.78
4.417	0.24	0.65	0.021	I		0					0.76
4.433	0.23	0.64	0.021	I		0					0.74
4.450	0.23	0.62	0.020	I		0					0.72
4.467	0.22	0.61	0.020	I		0					0.70
4.483	0.21	0.60	0.019	I		0					0.68
4.500	0.21	0.58	0.019	I		0					0.66
4.517	0.20	0.57	0.018	I		0					0.64
4.533	0.19	0.56	0.017	I		0					0.62
4.550	0.18	0.54	0.017	I		0					0.61
4.567	0.18	0.53	0.017	I		0					0.59
4.583	0.17	0.52	0.016	I		0					0.57
4.600	0.16	0.51	0.016	I		0					0.56
4.617	0.16	0.50	0.015	I		0					0.54
4.633	0.16	0.49	0.015	I		0					0.52
4.650	0.16	0.47	0.014	I		0					0.51
4.667	0.15	0.46	0.014	I		0					0.49
4.683	0.15	0.45	0.013	I		0					0.48
4.700	0.15	0.43	0.013	I		0					0.46
4.717	0.14	0.42	0.013	I		0					0.45
4.733	0.14	0.41	0.012	I		0					0.43
4.750	0.14	0.40	0.012	I		0					0.42
4.767	0.13	0.38	0.011	I	0						0.41
4.783	0.13	0.37	0.011	I	0						0.40
4.800	0.13	0.36	0.011	I	0						0.38
4.817	0.13	0.35	0.010	I	0						0.37
4.833	0.13	0.34	0.010	I	0						0.36
4.850	0.12	0.33	0.010	I	0						0.35
4.867	0.12	0.32	0.010	I	0						0.34
4.883	0.12	0.31	0.009	I	0						0.33
4.900	0.12	0.30	0.009	I	0						0.32
4.917	0.12	0.30	0.009	I	0						0.31
4.933	0.11	0.29	0.009	I	0						0.31
4.950	0.11	0.28	0.008	I	0						0.30
4.967	0.11	0.27	0.008	I	0						0.29
4.983	0.11	0.26	0.008	I	0						0.28
5.000	0.11	0.26	0.008	I	0						0.27
5.017	0.11	0.25	0.007	I	0						0.27
5.033	0.11	0.24	0.007	I	0						0.26
5.050	0.10	0.24	0.007	I	0						0.25
5.067	0.10	0.23	0.007	I	0						0.25
5.083	0.10	0.23	0.007	I	0						0.24
5.100	0.10	0.22	0.007	I	0						0.23
5.117	0.10	0.22	0.006	I	0						0.23
5.133	0.10	0.21	0.006	I	0						0.22
5.150	0.10	0.20	0.006	I	0						0.22
5.167	0.10	0.20	0.006	I	0						0.21
5.183	0.09	0.20	0.006	I	0						0.21
5.200	0.09	0.19	0.006	I	0						0.20
5.217	0.09	0.19	0.006	I	0						0.20
5.233	0.09	0.18	0.005	I	0						0.19
5.250	0.09	0.18	0.005	I	0						0.19

PR4ANORTHDET

5.267	0.09	0.17	0.005	I 0					0.19
5.283	0.09	0.17	0.005	I 0					0.18
5.300	0.09	0.17	0.005	I 0					0.18
5.317	0.09	0.16	0.005	I 0					0.17
5.333	0.09	0.16	0.005	I 0					0.17
5.350	0.09	0.16	0.005	I 0					0.17
5.367	0.09	0.15	0.005	I 0					0.16
5.383	0.08	0.15	0.004	I 0					0.16
5.400	0.08	0.15	0.004	I 0					0.16
5.417	0.08	0.14	0.004	IO					0.15
5.433	0.08	0.14	0.004	IO					0.15
5.450	0.08	0.14	0.004	IO					0.15
5.467	0.08	0.14	0.004	IO					0.14
5.483	0.08	0.13	0.004	IO					0.14
5.500	0.08	0.13	0.004	IO					0.14
5.517	0.08	0.13	0.004	IO					0.14
5.533	0.08	0.13	0.004	IO					0.13
5.550	0.08	0.12	0.004	IO					0.13
5.567	0.08	0.12	0.004	IO					0.13
5.583	0.08	0.12	0.004	IO					0.13
5.600	0.08	0.12	0.004	IO					0.13
5.617	0.08	0.12	0.003	IO					0.12
5.633	0.07	0.11	0.003	IO					0.12
5.650	0.07	0.11	0.003	IO					0.12
5.667	0.07	0.11	0.003	IO					0.12
5.683	0.07	0.11	0.003	IO					0.12
5.700	0.07	0.11	0.003	IO					0.11
5.717	0.07	0.11	0.003	IO					0.11
5.733	0.07	0.10	0.003	IO					0.11
5.750	0.07	0.10	0.003	IO					0.11
5.767	0.07	0.10	0.003	IO					0.11
5.783	0.07	0.10	0.003	IO					0.11
5.800	0.07	0.10	0.003	IO					0.11
5.817	0.07	0.10	0.003	IO					0.10
5.833	0.07	0.10	0.003	O					0.10
5.850	0.07	0.09	0.003	O					0.10
5.867	0.07	0.09	0.003	O					0.10
5.883	0.07	0.09	0.003	O					0.10
5.900	0.07	0.09	0.003	O					0.10
5.917	0.07	0.09	0.003	O					0.10
5.933	0.07	0.09	0.003	O					0.09
5.950	0.07	0.09	0.003	O					0.09
5.967	0.07	0.09	0.003	O					0.09
5.983	0.07	0.09	0.003	O					0.09
6.000	0.06	0.09	0.003	O					0.09
6.017	0.06	0.08	0.003	O					0.09
6.033	0.06	0.08	0.002	O					0.09
6.050	0.06	0.08	0.002	O					0.09
6.067	0.06	0.08	0.002	O					0.09
6.083	0.06	0.08	0.002	O					0.09
6.100	0.06	0.08	0.002	O					0.09
6.117	0.06	0.08	0.002	O					0.08
6.133	0.06	0.08	0.002	O					0.08
6.150	0.06	0.08	0.002	O					0.08
6.167	0.06	0.08	0.002	O					0.08
6.183	0.06	0.08	0.002	O					0.08
6.200	0.06	0.08	0.002	O					0.08
6.217	0.00	0.07	0.002	IO					0.08
6.233	0.00	0.07	0.002	IO					0.07
6.250	0.00	0.07	0.002	IO					0.07
6.267	0.00	0.06	0.002	IO					0.07
6.283	0.00	0.06	0.002	IO					0.07
6.300	0.00	0.06	0.002	IO					0.06

PR4ANORTHDET									
6.317	0.00	0.06	0.002	IO					0.06
6.333	0.00	0.05	0.002	IO					0.06
6.350	0.00	0.05	0.002	IO					0.05
6.367	0.00	0.05	0.001	IO					0.05
6.383	0.00	0.05	0.001	0					0.05
6.400	0.00	0.04	0.001	0					0.05
6.417	0.00	0.04	0.001	0					0.04
6.433	0.00	0.04	0.001	0					0.04
6.450	0.00	0.04	0.001	0					0.04
6.467	0.00	0.04	0.001	0					0.04
6.483	0.00	0.04	0.001	0					0.04
6.500	0.00	0.03	0.001	0					0.04
6.517	0.00	0.03	0.001	0					0.03
6.533	0.00	0.03	0.001	0					0.03
6.550	0.00	0.03	0.001	0					0.03
6.567	0.00	0.03	0.001	0					0.03
6.583	0.00	0.03	0.001	0					0.03
6.600	0.00	0.03	0.001	0					0.03
6.617	0.00	0.02	0.001	0					0.03
6.633	0.00	0.02	0.001	0					0.02
6.650	0.00	0.02	0.001	0					0.02
6.667	0.00	0.02	0.001	0					0.02
6.683	0.00	0.02	0.001	0					0.02
6.700	0.00	0.02	0.001	0					0.02
6.717	0.00	0.02	0.001	0					0.02
6.733	0.00	0.02	0.001	0					0.02
6.750	0.00	0.02	0.000	0					0.02
6.767	0.00	0.02	0.000	0					0.02
6.783	0.00	0.02	0.000	0					0.02
6.800	0.00	0.01	0.000	0					0.02
6.817	0.00	0.01	0.000	0					0.01
6.833	0.00	0.01	0.000	0					0.01
6.850	0.00	0.01	0.000	0					0.01
6.867	0.00	0.01	0.000	0					0.01
6.883	0.00	0.01	0.000	0					0.01
6.900	0.00	0.01	0.000	0					0.01
6.917	0.00	0.01	0.000	0					0.01
6.933	0.00	0.01	0.000	0					0.01
6.950	0.00	0.01	0.000	0					0.01
6.967	0.00	0.01	0.000	0					0.01
6.983	0.00	0.01	0.000	0					0.01
7.000	0.00	0.01	0.000	0					0.01
7.017	0.00	0.01	0.000	0					0.01
7.033	0.00	0.01	0.000	0					0.01
7.050	0.00	0.01	0.000	0					0.01
7.067	0.00	0.01	0.000	0					0.01
7.083	0.00	0.01	0.000	0					0.01
7.100	0.00	0.01	0.000	0					0.01
7.117	0.00	0.01	0.000	0					0.01
7.133	0.00	0.01	0.000	0					0.01
7.150	0.00	0.01	0.000	0					0.01
7.167	0.00	0.01	0.000	0					0.01
7.183	0.00	0.01	0.000	0					0.01
7.200	0.00	0.00	0.000	0					0.01
7.217	0.00	0.00	0.000	0					0.00
7.233	0.00	0.00	0.000	0					0.00
7.250	0.00	0.00	0.000	0					0.00
7.267	0.00	0.00	0.000	0					0.00
7.283	0.00	0.00	0.000	0					0.00
7.300	0.00	0.00	0.000	0					0.00
7.317	0.00	0.00	0.000	0					0.00
7.333	0.00	0.00	0.000	0					0.00
7.350	0.00	0.00	0.000	0					0.00

PR4ANORTHDET					
7.367	0.00	0.00	0.000	0	0.00
7.383	0.00	0.00	0.000	0	0.00
7.400	0.00	0.00	0.000	0	0.00
7.417	0.00	0.00	0.000	0	0.00
7.433	0.00	0.00	0.000	0	0.00
7.450	0.00	0.00	0.000	0	0.00
7.467	0.00	0.00	0.000	0	0.00
7.483	0.00	0.00	0.000	0	0.00
7.500	0.00	0.00	0.000	0	0.00
7.517	0.00	0.00	0.000	0	0.00
7.533	0.00	0.00	0.000	0	0.00
7.550	0.00	0.00	0.000	0	0.00
7.567	0.00	0.00	0.000	0	0.00
7.583	0.00	0.00	0.000	0	0.00
7.600	0.00	0.00	0.000	0	0.00
7.617	0.00	0.00	0.000	0	0.00
7.633	0.00	0.00	0.000	0	0.00
7.650	0.00	0.00	0.000	0	0.00
7.667	0.00	0.00	0.000	0	0.00
7.683	0.00	0.00	0.000	0	0.00
7.700	0.00	0.00	0.000	0	0.00
7.717	0.00	0.00	0.000	0	0.00
7.733	0.00	0.00	0.000	0	0.00
7.750	0.00	0.00	0.000	0	0.00
7.767	0.00	0.00	0.000	0	0.00

```

*****HYDROGRAPH DATA*****
      Number of intervals = 466
      Time interval = 1.0 (Min.)
      Maximum/Peak flow rate = 0.696 (CFS)
      Total volume = 0.086 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****

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PR4ANORTHHYD

PR4ANORTHROUTE

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 401.000 to Point/Station 402.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
Rainfall intensity (I) = 3.334(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 17.13 min. Rain intensity = 3.33(In/Hr)
Total area = 0.802(Ac.) Total runoff = 0.696(CFS)

+++++
Process from Point/Station 402.000 to Point/Station 404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 373.600(Ft.)
Downstream point/station elevation = 367.200(Ft.)
Pipe length = 75.00(Ft.) Slope = 0.0853 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.696(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 0.696(CFS)
Normal flow depth in pipe = 2.10(In.)
Flow top width inside pipe = 9.12(In.)
Critical Depth = 4.17(In.)
Pipe flow velocity = 7.53(Ft/s)
Travel time through pipe = 0.17 min.
Time of concentration (TC) = 17.30 min.
End of computations, total study area = 0.802 (Ac.)

IMP5NORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 501.000 to Point/Station 502.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[INDUSTRIAL area type]
(General Industrial)
Impervious value, Ai = 0.950
Sub-Area C Value = 0.870
Initial subarea total flow distance = 482.000(Ft.)
Highest elevation = 390.990(Ft.)
Lowest elevation = 368.500(Ft.)
Elevation difference = 22.490(Ft.) Slope = 4.666 %
Top of Initial Area Slope adjusted by User to 4.871 %
Bottom of Initial Area Slope adjusted by User to 4.871 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 90.00 (Ft)
for the top area slope value of 4.87 %, in a development type of
General Industrial
In Accordance With Figure 3-3
Initial Area Time of Concentration = 2.32 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.8700) * (90.000^{.5}) / (4.871^{(1/3)})] = 2.32$
The initial area total distance of 482.00 (Ft.) entered leaves a
remaining distance of 392.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 2.48 minutes
for a distance of 392.00 (Ft.) and a slope of 4.87 %
with an elevation difference of 19.09(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 2.481 Minutes
 $Tt = [(11.9 * 0.0742^3) / (19.09)]^{.385} = 2.48$
Total initial area Ti = 2.32 minutes from Figure 3-3 formula plus
2.48 minutes from the Figure 3-4 formula = 4.80 minutes

IMP5NORTH

Calculated TC of 4.798 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
 Rainfall intensity (I) = 7.377(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.870
 Subarea runoff = 3.177(CFS)
 Total initial stream area = 0.495(Ac.)

++++++
 Process from Point/Station 502.000 to Point/Station 404.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 365.500(Ft.)
 Downstream point/station elevation = 364.000(Ft.)
 Pipe length = 31.00(Ft.) Slope = 0.0484 Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 3.177(CFS)
 Given pipe size = 12.00(In.)
 Calculated individual pipe flow = 3.177(CFS)
 Normal flow depth in pipe = 5.32(In.)
 Flow top width inside pipe = 11.92(In.)
 Critical Depth = 9.16(In.)
 Pipe flow velocity = 9.46(Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 4.85 min.
 End of computations, total study area = 0.495 (Ac.)

PR4CNORTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 303.000 to Point/Station 306.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
Rainfall intensity (I) = 3.995(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 12.94 min. Rain intensity = 4.00(In/Hr)
Total area = 1.547(Ac.) Total runoff = 2.225(CFS)

+++++
Process from Point/Station 303.000 to Point/Station 306.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 1.547(Ac.)
Runoff from this stream = 2.225(CFS)
Time of concentration = 12.94 min.
Rainfall intensity = 3.995(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 305.000 to Point/Station 306.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350

PR4CNORTH

Initial subarea total flow distance = 250.000(Ft.)
Highest elevation = 391.990(Ft.)
Lowest elevation = 376.100(Ft.)
Elevation difference = 15.890(Ft.) Slope = 6.356 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 6.36 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 7.29 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5}] / (\% slope^{(1/3)})$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5})] / (6.356^{(1/3)}) = 7.29$
The initial area total distance of 250.00 (Ft.) entered leaves a
remaining distance of 150.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.07 minutes
for a distance of 150.00 (Ft.) and a slope of 6.36 %
with an elevation difference of 9.53(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation change(Ft.))^{.385} * 60(min/hr)$
= 1.069 Minutes
 $Tt = [(11.9 * 0.0284^3) / (9.53)]^{.385} = 1.07$
Total initial area $Ti = 7.29$ minutes from Figure 3-3 formula plus
1.07 minutes from the Figure 3-4 formula = 8.36 minutes
Rainfall intensity (I) = 5.297(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
Subarea runoff = 1.138(CFS)
Total initial stream area = 0.614(Ac.)

Process from Point/Station 305.000 to Point/Station 306.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
Stream flow area = 0.614(Ac.)
Runoff from this stream = 1.138(CFS)
Time of concentration = 8.36 min.
Rainfall intensity = 5.297(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	2.225	12.94	3.995
2	1.138	8.36	5.297
Qmax(1) =			
	1.000 *	1.000 *	2.225) +
	0.754 *	1.000 *	1.138) + = 3.084
Qmax(2) =			
	1.000 *	0.646 *	2.225) +
	1.000 *	1.000 *	1.138) + = 2.575

Total of 2 main streams to confluence:
Flow rates before confluence point:
2.225 1.138
Maximum flow rates at confluence using above data:
3.084 2.575
Area of streams before confluence:
1.547 0.614

Results of confluence:

PR4CNORTH
Total flow rate = 3.084(CFS)
Time of concentration = 12.940 min.
Effective stream area after confluence = 2.161(Ac.)

+++++
Process from Point/Station 306.000 to Point/Station 404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 373.120(Ft.)
Downstream point/station elevation = 367.200(Ft.)
Pipe length = 140.00(Ft.) Slope = 0.0423 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 3.084(CFS)
Given pipe size = 15.00(In.)
Calculated individual pipe flow = 3.084(CFS)
Normal flow depth in pipe = 4.92(In.)
Flow top width inside pipe = 14.08(In.)
Critical Depth = 8.47(In.)
Pipe flow velocity = 8.81(Ft/s)
Travel time through pipe = 0.26 min.
Time of concentration (TC) = 13.20 min.

+++++
Process from Point/Station 306.000 to Point/Station 404.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 2.161(Ac.)
Runoff from this stream = 3.084(CFS)
Time of concentration = 13.20 min.
Rainfall intensity = 3.943(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 403.000 to Point/Station 404.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1748.000(Ft.)
Highest elevation = 467.500(Ft.)
Lowest elevation = 367.200(Ft.)
Elevation difference = 100.300(Ft.) Slope = 5.738 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 5.74 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 7.54 minutes
 $TC = [1.8 * (1.1 - C) * \text{distance}(\text{Ft.})^{.5} / (\% \text{ slope}^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (5.738^{(1/3)})] = 7.54$
The initial area total distance of 1748.00 (Ft.) entered leaves a
remaining distance of 1648.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 7.04 minutes

PR4CNORTH

for a distance of 1648.00 (Ft.) and a slope of 5.74 %
 with an elevation difference of 94.56(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3] / (\text{elevation change}(\text{Ft.}))^{.385} * 60(\text{min/hr})$
 = 7.039 Minutes
 $Tt = [(11.9 * 0.3121^3) / (94.56)]^{.385} = 7.04$
 Total initial area $Ti = 7.54$ minutes from Figure 3-3 formula plus
 7.04 minutes from the Figure 3-4 formula = 14.58 minutes
 Rainfall intensity (I) = 3.699(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is $C = 0.350$
 Subarea runoff = 26.503(CFS)
 Total initial stream area = 20.470(Ac.)

 Process from Point/Station 403.000 to Point/Station 404.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 20.470(Ac.)
 Runoff from this stream = 26.503(CFS)
 Time of concentration = 14.58 min.
 Rainfall intensity = 3.699(In/Hr)
 Program is now starting with Main Stream No. 3

 Process from Point/Station 402.000 to Point/Station 404.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
 Rainfall intensity (I) = 3.313(In/Hr) for a 100.0 year storm
 User specified values are as follows:
 TC = 17.30 min. Rain intensity = 3.31(In/Hr)
 Total area = 0.802(Ac.) Total runoff = 0.696(CFS)

 Process from Point/Station 402.000 to Point/Station 404.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 3
 Stream flow area = 0.802(Ac.)
 Runoff from this stream = 0.696(CFS)
 Time of concentration = 17.30 min.
 Rainfall intensity = 3.313(In/Hr)
 Program is now starting with Main Stream No. 4

 Process from Point/Station 502.000 to Point/Station 404.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.870 given for subarea
 Calculated TC of 4.850 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
 Rainfall intensity (I) = 7.377(In/Hr) for a 100.0 year storm
 User specified values are as follows:
 TC = 4.85 min. Rain intensity = 7.38(In/Hr)
 Total area = 0.495(Ac.) Total runoff = 3.177(CFS)

PR4CNORTH

 Process from Point/Station 502.000 to Point/Station 404.000
 ***** CONFLUENCE OF MAIN STREAMS *****

The following data inside Main Stream is listed:

In Main Stream number: 4
 Stream flow area = 0.495(Ac.)
 Runoff from this stream = 3.177(CFS)
 Time of concentration = 4.85 min.
 Rainfall intensity = 7.377(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	3.084	13.20	3.943
2	26.503	14.58	3.699
3	0.696	17.30	3.313
4	3.177	4.85	7.377

Qmax(1) =

1.000 *	1.000 *	3.084)	+
1.000 *	0.906 *	26.503)	+
1.000 *	0.763 *	0.696)	+
0.535 *	1.000 *	3.177)	+
			= 29.316

Qmax(2) =

0.938 *	1.000 *	3.084)	+
1.000 *	1.000 *	26.503)	+
1.000 *	0.843 *	0.696)	+
0.501 *	1.000 *	3.177)	+
			= 31.575

Qmax(3) =

0.840 *	1.000 *	3.084)	+
0.896 *	1.000 *	26.503)	+
1.000 *	1.000 *	0.696)	+
0.449 *	1.000 *	3.177)	+
			= 28.447

Qmax(4) =

1.000 *	0.367 *	3.084)	+
1.000 *	0.333 *	26.503)	+
1.000 *	0.280 *	0.696)	+
1.000 *	1.000 *	3.177)	+
			= 13.321

Total of 4 main streams to confluence:

Flow rates before confluence point:

3.084 26.503 0.696 3.177

Maximum flow rates at confluence using above data:

29.316 31.575 28.447 13.321

Area of streams before confluence:

2.161 20.470 0.802 0.495

Results of confluence:

Total flow rate = 31.575(CFS)

Time of concentration = 14.580 min.

Effective stream area after confluence = 23.928(Ac.)

 Process from Point/Station 404.000 to Point/Station 405.000
 ***** PIPEFLOW TRAVEL TIME (User specified size) *****

Upstream point/station elevation = 363.290(Ft.)

Downstream point/station elevation = 362.420(Ft.)

Pipe length = 58.00(Ft.) Slope = 0.0150 Manning's N = 0.013

PR4CNORTH
No. of pipes = 2 Required pipe flow = 31.575(CFS)
Given pipe size = 24.00(In.)
Calculated individual pipe flow = 15.788(CFS)
Normal flow depth in pipe = 12.98(In.)
Flow top width inside pipe = 23.92(In.)
Critical Depth = 17.19(In.)
Pipe flow velocity = 9.11(Ft/s)
Travel time through pipe = 0.11 min.
Time of concentration (TC) = 14.69 min.
End of computations, total study area = 23.928 (Ac.)

SOUTH SITE

PR1CSOUTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MEDIUM DENSITY RESIDENTIAL]
(4.3 DU/A or Less)
Impervious value, Ai = 0.300
Sub-Area C Value = 0.520
Initial subarea total flow distance = 143.000(Ft.)
Highest elevation = 407.830(Ft.)
Lowest elevation = 405.120(Ft.)
Elevation difference = 2.710(Ft.) Slope = 1.895 %
Top of Initial Area Slope adjusted by User to 0.996 %
Bottom of Initial Area Slope adjusted by User to 0.996 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of 1.00 %, in a development type of
4.3 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.75 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.5200) * (70.000^{.5}) / (0.996^{(1/3)})] = 8.75$
The initial area total distance of 143.00 (Ft.) entered leaves a
remaining distance of 73.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.25 minutes
for a distance of 73.00 (Ft.) and a slope of 1.00 %
with an elevation difference of 0.73(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 1.253 Minutes
 $Tt = [(11.9 * 0.0138^3) / (0.73)]^{.385} = 1.25$
Total initial area Ti = 8.75 minutes from Figure 3-3 formula plus
1.25 minutes from the Figure 3-4 formula = 10.00 minutes

PR1CSOUTH
Rainfall intensity (I) = 4.718(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.520
Subarea runoff = 1.259(CFS)
Total initial stream area = 0.513(Ac.)

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 404.120(Ft.)
Downstream point/station elevation = 391.400(Ft.)
Pipe length = 137.00(Ft.) Slope = 0.0928 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 1.259(CFS)
Nearest computed pipe diameter = 6.00(In.)
Calculated individual pipe flow = 1.259(CFS)
Normal flow depth in pipe = 3.83(In.)
Flow top width inside pipe = 5.77(In.)
Critical depth could not be calculated.
Pipe flow velocity = 9.52(Ft/s)
Travel time through pipe = 0.24 min.
Time of concentration (TC) = 10.24 min.

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 0.513(Ac.)
Runoff from this stream = 1.259(CFS)
Time of concentration = 10.24 min.
Rainfall intensity = 4.646(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(1.0 DU/A or Less)
Impervious value, Ai = 0.100
Sub-Area C Value = 0.410
Initial subarea total flow distance = 129.000(Ft.)
Highest elevation = 403.760(Ft.)
Lowest elevation = 401.980(Ft.)
Elevation difference = 1.780(Ft.) Slope = 1.380 %
Top of Initial Area Slope adjusted by User to 0.904 %
Bottom of Initial Area Slope adjusted by User to 0.904 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of 0.90 %, in a development type of
1.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 10.75 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^0.5]/(% slope^(1/3))
TC = [1.8*(1.1-0.410)*(70.000^0.5)/(0.904^(1/3))]= 10.75

PR1CSOUTH

The initial area total distance of 129.00 (Ft.) entered leaves a remaining distance of 59.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.10 minutes for a distance of 59.00 (Ft.) and a slope of 0.90 %
with an elevation difference of 0.53(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3] / (\text{elevation change}(\text{Ft.}))^{.385} * 60(\text{min/hr})$
= 1.104 Minutes
 $Tt = [(11.9 * 0.0112^3) / (0.53)]^{.385} = 1.10$
Total initial area $Ti = 10.75$ minutes from Figure 3-3 formula plus 1.10 minutes from the Figure 3-4 formula = 11.85 minutes
Rainfall intensity (I) = 4.228(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area ($Q=KCIA$) is $C = 0.410$
Subarea runoff = 0.342(CFS)
Total initial stream area = 0.197(Ac.)

Process from Point/Station 402.000 to Point/Station 303.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 400.980(Ft.)
Downstream point/station elevation = 391.400(Ft.)
Pipe length = 42.00(Ft.) Slope = 0.2281 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.342(CFS)
Given pipe size = 6.00(In.)
Calculated individual pipe flow = 0.342(CFS)
Normal flow depth in pipe = 1.45(In.)
Flow top width inside pipe = 5.13(In.)
Critical Depth = 3.56(In.)
Pipe flow velocity = 9.36(Ft/s)
Travel time through pipe = 0.07 min.
Time of concentration (TC) = 11.93 min.

Process from Point/Station 402.000 to Point/Station 303.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
Stream flow area = 0.197(Ac.)
Runoff from this stream = 0.342(CFS)
Time of concentration = 11.93 min.
Rainfall intensity = 4.211(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	1.259	10.24	4.646
2	0.342	11.93	4.211
Qmax(1) =			
	1.000 *	1.000 *	1.259) +
	1.000 *	0.859 *	0.342) + =
Qmax(2) =			
	0.906 *	1.000 *	1.259) +
	1.000 *	1.000 *	0.342) + =
			1.482

Total of 2 main streams to confluence:

Flow rates before confluence point:

1.259 0.342

Maximum flow rates at confluence using above data:

PR1CSOUTH

1.552 1.482
Area of streams before confluence:
0.513 0.197

Results of confluence:

Total flow rate = 1.552(CFS)
Time of concentration = 10.239 min.
Effective stream area after confluence = 0.710(Ac.)

+++++
Process from Point/Station 303.000 to Point/Station 102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 388.400(Ft.)
Downstream point/station elevation = 388.000(Ft.)
Pipe length = 85.00(Ft.) Slope = 0.0047 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 1.552(CFS)
Nearest computed pipe diameter = 12.00(In.)
Calculated individual pipe flow = 1.552(CFS)
Normal flow depth in pipe = 6.94(In.)
Flow top width inside pipe = 11.85(In.)
Critical Depth = 6.35(In.)
Pipe flow velocity = 3.30(Ft/s)
Travel time through pipe = 0.43 min.
Time of concentration (TC) = 10.67 min.

+++++
Process from Point/Station 303.000 to Point/Station 102.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 0.710(Ac.)
Runoff from this stream = 1.552(CFS)
Time of concentration = 10.67 min.
Rainfall intensity = 4.525(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1141.000(Ft.)
Highest elevation = 438.500(Ft.)
Lowest elevation = 388.000(Ft.)
Elevation difference = 50.500(Ft.) Slope = 4.426 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 4.43 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3

PR1CSOUTH

Initial Area Time of Concentration = 8.22 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5}] / (slope^{(1/3)})$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5})] / (4.426^{(1/3)}) = 8.22$
 The initial area total distance of 1141.00 (Ft.) entered leaves a remaining distance of 1041.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 5.46 minutes for a distance of 1041.00 (Ft.) and a slope of 4.43 % with an elevation difference of 46.07(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation\ change(Ft.))^{.385} * 60(min/hr)$
 $= 5.462\ Minutes$
 $Tt = [(11.9 * 0.1972^3) / (46.07)]^{.385} = 5.46$
 Total initial area $Ti = 8.22$ minutes from Figure 3-3 formula plus 5.46 minutes from the Figure 3-4 formula = 13.68 minutes
 Rainfall intensity (I) = 3.854(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is $C = 0.350$
 Subarea runoff = 10.615(CFS)
 Total initial stream area = 7.870(Ac.)

 Process from Point/Station 101.000 to Point/Station 102.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 7.870(Ac.)
 Runoff from this stream = 10.615(CFS)
 Time of concentration = 13.68 min.
 Rainfall intensity = 3.854(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	1.552	10.67	4.525
2	10.615	13.68	3.854
Qmax(1) =			
	1.000 *	1.000 *	1.552) +
	1.000 *	0.780 *	10.615) + = 9.828
Qmax(2) =			
	0.852 *	1.000 *	1.552) +
	1.000 *	1.000 *	10.615) + = 11.937

Total of 2 main streams to confluence:
 Flow rates before confluence point:
 1.552 10.615
 Maximum flow rates at confluence using above data:
 9.828 11.937
 Area of streams before confluence:
 0.710 7.870

Results of confluence:
 Total flow rate = 11.937(CFS)
 Time of concentration = 13.684 min.
 Effective stream area after confluence = 8.580(Ac.)
 End of computations, total study area = 8.580 (Ac.)

Detention Design

Pipe:

diameter 6 inches 0.50 ft
coefficient 0.013

$$Q = C_o A_o \sqrt{2g(H_o)} \quad (6-12)$$

where ...

Q = orifice flow discharge (ft³/s);
 C_o = orifice discharge coefficient;
 A_o = cross-sectional area of flow through the orifice (ft²);
 g = gravitational acceleration (32.2 ft/s²);
 H_o = effective head above orifice (ft); and

San Diego County Drainage Design Manual
July 2005

Page 6-11

C_o = 0.60 from Table 6.1 County Drainage Design Manual
 A_o = 0.20 sf
 g = 32.20 sf/sec
 C = 2.90

Stage	Depth (ft)	Effective Head (Ho)	Volume (cf)	Area (Ac.ft)	Orifice Flow (cfs)
391.40	0.00	0.00	0	0.000	0.00
391.90	0.50	0.25	459	0.011	0.47
392.40	1.00	0.75	1047	0.024	0.82

Hydrology Parameters

Before Detention
 Q = 1.450 cfs
 A = 0.710 Acre
 T_c = 11.74 min.
 C = 0.460
 I = 4.700 in/hr

After Detention
 Δt = 6.96 min.
 Q = 0.680 cfs
 A = 0.710 Acre
 T_c = 18.70 min.

PR1CSOUTHHD

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MEDIUM DENSITY RESIDENTIAL]
(4.3 DU/A or Less)
Impervious value, Ai = 0.300
Sub-Area C Value = 0.520
Initial subarea total flow distance = 143.000(Ft.)
Highest elevation = 407.830(Ft.)
Lowest elevation = 405.120(Ft.)
Elevation difference = 2.710(Ft.) Slope = 1.895 %
Top of Initial Area Slope adjusted by User to 0.996 %
Bottom of Initial Area Slope adjusted by User to 0.996 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of 1.00 %, in a development type of
4.3 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.75 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5}] / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.520) * (70.000^{.5})] / (0.996^{(1/3)}) = 8.75$
The initial area total distance of 143.00 (Ft.) entered leaves a
remaining distance of 73.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.25 minutes
for a distance of 73.00 (Ft.) and a slope of 1.00 %
with an elevation difference of 0.73(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3] / (elevation change(Ft.))^{.385} * 60(min/hr)$
= 1.253 Minutes
 $Tt = [(11.9 * 0.0138^3) / (0.73)]^{.385} = 1.25$
Total initial area Ti = 8.75 minutes from Figure 3-3 formula plus
1.25 minutes from the Figure 3-4 formula = 10.00 minutes

PR1CSOUTHYYD
Rainfall intensity (I) = 4.718(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.520
Subarea runoff = 1.259(CFS)
Total initial stream area = 0.513(Ac.)

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 404.120(Ft.)
Downstream point/station elevation = 391.400(Ft.)
Pipe length = 137.00(Ft.) Slope = 0.0928 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 1.259(CFS)
Nearest computed pipe diameter = 6.00(In.)
Calculated individual pipe flow = 1.259(CFS)
Normal flow depth in pipe = 3.83(In.)
Flow top width inside pipe = 5.77(In.)
Critical depth could not be calculated.
Pipe flow velocity = 9.52(Ft/s)
Travel time through pipe = 0.24 min.
Time of concentration (TC) = 10.24 min.

+++++
Process from Point/Station 302.000 to Point/Station 303.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 0.513(Ac.)
Runoff from this stream = 1.259(CFS)
Time of concentration = 10.24 min.
Rainfall intensity = 4.646(In/Hr)
Program is now starting with Main Stream No. 2

+++++
Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(1.0 DU/A or Less)
Impervious value, Ai = 0.100
Sub-Area C Value = 0.410
Initial subarea total flow distance = 129.000(Ft.)
Highest elevation = 403.760(Ft.)
Lowest elevation = 401.980(Ft.)
Elevation difference = 1.780(Ft.) Slope = 1.380 %
Top of Initial Area Slope adjusted by User to 0.904 %
Bottom of Initial Area Slope adjusted by User to 0.904 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of 0.90 %, in a development type of
1.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 10.75 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^0.5]/(% slope^(1/3))
TC = [1.8*(1.1-0.410)*(70.000^0.5)/(0.904^(1/3))]= 10.75

PR1CSOUTHHD

The initial area total distance of 129.00 (Ft.) entered leaves a remaining distance of 59.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.10 minutes for a distance of 59.00 (Ft.) and a slope of 0.90 %
with an elevation difference of 0.53(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3] / (\text{elevation change}(\text{Ft.}))^{.385} * 60(\text{min/hr})$
= 1.104 Minutes
 $Tt = [(11.9 * 0.0112^3) / (0.53)]^{.385} = 1.10$
Total initial area $Ti = 10.75$ minutes from Figure 3-3 formula plus 1.10 minutes from the Figure 3-4 formula = 11.85 minutes
Rainfall intensity (I) = 4.228(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is $C = 0.410$
Subarea runoff = 0.342(CFS)
Total initial stream area = 0.197(Ac.)

Process from Point/Station 402.000 to Point/Station 303.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 400.980(Ft.)
Downstream point/station elevation = 391.400(Ft.)
Pipe length = 42.00(Ft.) Slope = 0.2281 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.342(CFS)
Given pipe size = 6.00(In.)
Calculated individual pipe flow = 0.342(CFS)
Normal flow depth in pipe = 1.45(In.)
Flow top width inside pipe = 5.13(In.)
Critical Depth = 3.56(In.)
Pipe flow velocity = 9.36(Ft/s)
Travel time through pipe = 0.07 min.
Time of concentration (TC) = 11.93 min.

Process from Point/Station 402.000 to Point/Station 303.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
Stream flow area = 0.197(Ac.)
Runoff from this stream = 0.342(CFS)
Time of concentration = 11.93 min.
Rainfall intensity = 4.211(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	1.259	10.24	4.646
2	0.342	11.93	4.211
Qmax(1) =			
	1.000 *	1.000 *	1.259) +
	1.000 *	0.859 *	0.342) + = 1.552
Qmax(2) =			
	0.906 *	1.000 *	1.259) +
	1.000 *	1.000 *	0.342) + = 1.482

Total of 2 main streams to confluence:

Flow rates before confluence point:

1.259 0.342

Maximum flow rates at confluence using above data:

PR1CSOUTHHD

1.552 1.482
Area of streams before confluence:
0.513 0.197

Results of confluence:

Total flow rate = 1.552(CFS)
Time of concentration = 10.239 min.
Effective stream area after confluence = 0.710(Ac.)

+++++
Process from Point/Station 303.000 to Point/Station 102.000
**** 6 HOUR HYDROGRAPH ****

+++++
Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 10.24
Basin Area = 0.71 Acres
6 Hour Rainfall = 2.800 Inches
Runoff Coefficient = 0.489
Peak Discharge = 1.55 CFS

Time (Min)	Discharge (CFS)
0	0.000
10	0.058
20	0.059
30	0.062
40	0.063
50	0.066
60	0.067
70	0.070
80	0.072
90	0.076
100	0.078
110	0.083
120	0.086
130	0.092
140	0.095
150	0.104
160	0.109
170	0.120
180	0.128
190	0.146
200	0.159
210	0.194
220	0.221
230	0.325
240	0.457
250	1.552
260	0.260
270	0.174
280	0.136
290	0.114
300	0.099
310	0.089
320	0.080
330	0.074
340	0.069
350	0.064
360	0.060
370	0.057

PR1CSOUTHHYD

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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 1 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	0.4	0.8	1.2	1.6
0+ 0	0.0000		0.00	Q				
0+ 1	0.0000		0.01	Q				
0+ 2	0.0000		0.01	Q				
0+ 3	0.0000		0.02	Q				
0+ 4	0.0001		0.02	Q				
0+ 5	0.0001		0.03	Q				
0+ 6	0.0002		0.03	Q				
0+ 7	0.0002		0.04	VQ				
0+ 8	0.0003		0.05	VQ				
0+ 9	0.0004		0.05	VQ				
0+10	0.0004		0.06	VQ				
0+11	0.0005		0.06	VQ				
0+12	0.0006		0.06	VQ				
0+13	0.0007		0.06	VQ				
0+14	0.0008		0.06	VQ				
0+15	0.0008		0.06	VQ				
0+16	0.0009		0.06	VQ				
0+17	0.0010		0.06	VQ				
0+18	0.0011		0.06	VQ				
0+19	0.0012		0.06	VQ				
0+20	0.0013		0.06	VQ				
0+21	0.0013		0.06	VQ				
0+22	0.0014		0.06	VQ				
0+23	0.0015		0.06	VQ				
0+24	0.0016		0.06	VQ				
0+25	0.0017		0.06	VQ				
0+26	0.0017		0.06	VQ				
0+27	0.0018		0.06	VQ				
0+28	0.0019		0.06	VQ				
0+29	0.0020		0.06	Q				
0+30	0.0021		0.06	Q				
0+31	0.0022		0.06	Q				
0+32	0.0023		0.06	Q				
0+33	0.0023		0.06	Q				
0+34	0.0024		0.06	Q				
0+35	0.0025		0.06	Q				
0+36	0.0026		0.06	Q				
0+37	0.0027		0.06	Q				
0+38	0.0028		0.06	Q				
0+39	0.0029		0.06	Q				
0+40	0.0029		0.06	Q				
0+41	0.0030		0.06	Q				
0+42	0.0031		0.06	Q				
0+43	0.0032		0.06	Q				
0+44	0.0033		0.06	Q				
0+45	0.0034		0.06	Q				
0+46	0.0035		0.06	Q				
0+47	0.0036		0.06	Q				
0+48	0.0037		0.07	Q				
0+49	0.0037		0.07	Q				
0+50	0.0038		0.07	Q				
0+51	0.0039		0.07	Q				
0+52	0.0040		0.07	QV				
0+53	0.0041		0.07	QV				

PR1CSOUTHHYD

0+54	0.0042	0.07	QV
0+55	0.0043	0.07	QV
0+56	0.0044	0.07	QV
0+57	0.0045	0.07	QV
0+58	0.0046	0.07	QV
0+59	0.0047	0.07	QV
1+ 0	0.0047	0.07	QV
1+ 1	0.0048	0.07	QV
1+ 2	0.0049	0.07	QV
1+ 3	0.0050	0.07	QV
1+ 4	0.0051	0.07	QV
1+ 5	0.0052	0.07	QV
1+ 6	0.0053	0.07	QV
1+ 7	0.0054	0.07	QV
1+ 8	0.0055	0.07	QV
1+ 9	0.0056	0.07	QV
1+10	0.0057	0.07	QV
1+11	0.0058	0.07	QV
1+12	0.0059	0.07	QV
1+13	0.0060	0.07	Q V
1+14	0.0061	0.07	Q V
1+15	0.0062	0.07	Q V
1+16	0.0063	0.07	Q V
1+17	0.0064	0.07	Q V
1+18	0.0065	0.07	Q V
1+19	0.0066	0.07	Q V
1+20	0.0067	0.07	Q V
1+21	0.0068	0.07	Q V
1+22	0.0069	0.07	Q V
1+23	0.0070	0.07	Q V
1+24	0.0071	0.07	Q V
1+25	0.0072	0.07	Q V
1+26	0.0073	0.07	Q V
1+27	0.0074	0.07	Q V
1+28	0.0075	0.08	Q V
1+29	0.0076	0.08	Q V
1+30	0.0077	0.08	Q V
1+31	0.0078	0.08	Q V
1+32	0.0079	0.08	Q V
1+33	0.0080	0.08	Q V
1+34	0.0081	0.08	Q V
1+35	0.0082	0.08	Q V
1+36	0.0083	0.08	Q V
1+37	0.0084	0.08	Q V
1+38	0.0085	0.08	Q V
1+39	0.0087	0.08	Q V
1+40	0.0088	0.08	Q V
1+41	0.0089	0.08	Q V
1+42	0.0090	0.08	Q V
1+43	0.0091	0.08	Q V
1+44	0.0092	0.08	Q V
1+45	0.0093	0.08	Q V
1+46	0.0094	0.08	Q V
1+47	0.0095	0.08	Q V
1+48	0.0096	0.08	Q V
1+49	0.0098	0.08	Q V
1+50	0.0099	0.08	Q V
1+51	0.0100	0.08	Q V
1+52	0.0101	0.08	Q V
1+53	0.0102	0.08	Q V
1+54	0.0103	0.08	Q V
1+55	0.0105	0.08	Q V
1+56	0.0106	0.08	Q V

PR1CSOUTHHYD

1+57	0.0107	0.08	Q	V				
1+58	0.0108	0.09	Q	V				
1+59	0.0109	0.09	Q	V				
2+ 0	0.0110	0.09	Q	V				
2+ 1	0.0112	0.09	Q	V				
2+ 2	0.0113	0.09	Q	V				
2+ 3	0.0114	0.09	Q	V				
2+ 4	0.0115	0.09	Q	V				
2+ 5	0.0116	0.09	Q	V				
2+ 6	0.0118	0.09	Q	V				
2+ 7	0.0119	0.09	Q	V				
2+ 8	0.0120	0.09	Q	V				
2+ 9	0.0121	0.09	Q	V				
2+10	0.0123	0.09	Q	V				
2+11	0.0124	0.09	Q	V				
2+12	0.0125	0.09	Q	V				
2+13	0.0126	0.09	Q	V				
2+14	0.0128	0.09	Q	V				
2+15	0.0129	0.09	Q	V				
2+16	0.0130	0.09	Q	V				
2+17	0.0132	0.09	Q	V				
2+18	0.0133	0.09	Q	V				
2+19	0.0134	0.10	Q	V				
2+20	0.0136	0.10	Q	V				
2+21	0.0137	0.10	Q	V				
2+22	0.0138	0.10	Q	V				
2+23	0.0140	0.10	Q	V				
2+24	0.0141	0.10	Q	V				
2+25	0.0142	0.10	Q	V				
2+26	0.0144	0.10	Q	V				
2+27	0.0145	0.10	Q	V				
2+28	0.0146	0.10	Q	V				
2+29	0.0148	0.10	Q	V				
2+30	0.0149	0.10	Q	V				
2+31	0.0151	0.10	Q	V				
2+32	0.0152	0.10	Q	V				
2+33	0.0154	0.11	Q	V				
2+34	0.0155	0.11	Q	V				
2+35	0.0157	0.11	Q	V				
2+36	0.0158	0.11	Q	V				
2+37	0.0160	0.11	Q	V				
2+38	0.0161	0.11	Q	V				
2+39	0.0163	0.11	Q	V				
2+40	0.0164	0.11	Q	V				
2+41	0.0166	0.11	Q	V				
2+42	0.0167	0.11	Q	V				
2+43	0.0169	0.11	Q	V				
2+44	0.0170	0.11	Q	V				
2+45	0.0172	0.11	Q	V				
2+46	0.0173	0.12	Q	V				
2+47	0.0175	0.12	Q	V				
2+48	0.0177	0.12	Q	V				
2+49	0.0178	0.12	Q	V				
2+50	0.0180	0.12	Q	V				
2+51	0.0182	0.12	Q	V				
2+52	0.0183	0.12	Q	V				
2+53	0.0185	0.12	Q	V				
2+54	0.0187	0.12	Q	V				
2+55	0.0188	0.12	Q	V				
2+56	0.0190	0.12	Q	V				
2+57	0.0192	0.13	Q	V				
2+58	0.0194	0.13	Q	V				
2+59	0.0195	0.13	Q	V				

			PR1CSOUTHHYD			
3+ 0	0.0197	0.13	Q	V		
3+ 1	0.0199	0.13	Q	V		
3+ 2	0.0201	0.13	Q	V		
3+ 3	0.0202	0.13	Q	V		
3+ 4	0.0204	0.14	Q	V		
3+ 5	0.0206	0.14	Q	V		
3+ 6	0.0208	0.14	Q	V		
3+ 7	0.0210	0.14	Q	V		
3+ 8	0.0212	0.14	Q	V		
3+ 9	0.0214	0.14	Q	V		
3+10	0.0216	0.15	Q	V		
3+11	0.0218	0.15	Q	V		
3+12	0.0220	0.15	Q	V		
3+13	0.0222	0.15	Q	V		
3+14	0.0224	0.15	Q	V		
3+15	0.0226	0.15	Q	V		
3+16	0.0228	0.15	Q	V		
3+17	0.0231	0.16	Q	V		
3+18	0.0233	0.16	Q	V		
3+19	0.0235	0.16	Q	V		
3+20	0.0237	0.16	Q	V		
3+21	0.0239	0.16	Q	V		
3+22	0.0242	0.17	Q	V		
3+23	0.0244	0.17	Q	V		
3+24	0.0246	0.17	Q	V		
3+25	0.0249	0.18	Q	V		
3+26	0.0251	0.18	Q	V		
3+27	0.0254	0.18	Q	V		
3+28	0.0256	0.19	Q	V		
3+29	0.0259	0.19	Q	V		
3+30	0.0262	0.19	Q	V		
3+31	0.0264	0.20	Q	V		
3+32	0.0267	0.20	Q	V		
3+33	0.0270	0.20	Q	V		
3+34	0.0273	0.20	Q	V		
3+35	0.0276	0.21	Q	V		
3+36	0.0279	0.21	Q	V		
3+37	0.0281	0.21	Q	V		
3+38	0.0284	0.22	Q	V		
3+39	0.0287	0.22	Q	V		
3+40	0.0290	0.22	Q	V		
3+41	0.0294	0.23	Q	V		
3+42	0.0297	0.24	Q	V		
3+43	0.0300	0.25	Q	V		
3+44	0.0304	0.26	Q	V		
3+45	0.0308	0.27	Q	V		
3+46	0.0312	0.28	Q	V		
3+47	0.0316	0.29	Q	V		
3+48	0.0320	0.30	Q	V		
3+49	0.0324	0.31	Q	V		
3+50	0.0329	0.32	Q	V		
3+51	0.0333	0.34	Q	V		
3+52	0.0338	0.35	Q	V		
3+53	0.0343	0.36	Q	V		
3+54	0.0348	0.38	Q	V		
3+55	0.0354	0.39	Q	V		
3+56	0.0359	0.40	Q	V		
3+57	0.0365	0.42	Q	V		
3+58	0.0371	0.43	Q	V		
3+59	0.0377	0.44	Q	V		
4+ 0	0.0384	0.46	Q	V		
4+ 1	0.0391	0.57	Q	V		
4+ 2	0.0401	0.68	Q	V		

			PR1CSOUTHHYD			
4+ 3	0.0411	0.79			Q	
4+ 4	0.0424	0.90			V	
4+ 5	0.0438	1.00			Q	
4+ 6	0.0453	1.11			V	
4+ 7	0.0470	1.22			V	
4+ 8	0.0488	1.33			V	
4+ 9	0.0508	1.44			V	
4+10	0.0529	1.55			V	
4+11	0.0549	1.42			V	
4+12	0.0567	1.29			V	
4+13	0.0583	1.16			V	
4+14	0.0597	1.04			V	
4+15	0.0610	0.91			V	
4+16	0.0620	0.78			V	
4+17	0.0629	0.65			V	
4+18	0.0636	0.52			V	
4+19	0.0642	0.39			V	
4+20	0.0645	0.26			V	
4+21	0.0649	0.25			V	
4+22	0.0652	0.24			V	
4+23	0.0655	0.23			V	
4+24	0.0659	0.23			V	
4+25	0.0662	0.22			V	
4+26	0.0664	0.21			V	
4+27	0.0667	0.20			V	
4+28	0.0670	0.19			V	
4+29	0.0672	0.18			V	
4+30	0.0675	0.17			V	
4+31	0.0677	0.17			V	
4+32	0.0679	0.17			V	
4+33	0.0682	0.16			V	
4+34	0.0684	0.16			V	
4+35	0.0686	0.16			V	
4+36	0.0688	0.15			V	
4+37	0.0690	0.15			V	
4+38	0.0692	0.14			V	
4+39	0.0694	0.14			V	
4+40	0.0696	0.14			V	
4+41	0.0698	0.13			V	
4+42	0.0699	0.13			V	
4+43	0.0701	0.13			V	
4+44	0.0703	0.13			V	
4+45	0.0705	0.13			V	
4+46	0.0706	0.12			V	
4+47	0.0708	0.12			V	
4+48	0.0710	0.12			V	
4+49	0.0711	0.12			V	
4+50	0.0713	0.11			V	
4+51	0.0714	0.11			V	
4+52	0.0716	0.11			V	
4+53	0.0718	0.11			V	
4+54	0.0719	0.11			V	
4+55	0.0720	0.11			V	
4+56	0.0722	0.11			V	
4+57	0.0723	0.10			V	
4+58	0.0725	0.10			V	
4+59	0.0726	0.10			V	
5+ 0	0.0728	0.10			V	
5+ 1	0.0729	0.10			V	
5+ 2	0.0730	0.10			V	
5+ 3	0.0732	0.10			V	
5+ 4	0.0733	0.10			V	
5+ 5	0.0734	0.09			V	

PR1CSOUTHHYD

5+ 6	0.0735	0.09	Q			V
5+ 7	0.0737	0.09	Q			V
5+ 8	0.0738	0.09	Q			V
5+ 9	0.0739	0.09	Q			V
5+10	0.0740	0.09	Q			V
5+11	0.0742	0.09	Q			V
5+12	0.0743	0.09	Q			V
5+13	0.0744	0.09	Q			V
5+14	0.0745	0.09	Q			V
5+15	0.0746	0.08	Q			V
5+16	0.0747	0.08	Q			V
5+17	0.0749	0.08	Q			V
5+18	0.0750	0.08	Q			V
5+19	0.0751	0.08	Q			V
5+20	0.0752	0.08	Q			V
5+21	0.0753	0.08	Q			V
5+22	0.0754	0.08	Q			V
5+23	0.0755	0.08	Q			V
5+24	0.0756	0.08	Q			V
5+25	0.0757	0.08	Q			V
5+26	0.0758	0.08	Q			V
5+27	0.0760	0.08	Q			V
5+28	0.0761	0.08	Q			V
5+29	0.0762	0.07	Q			V
5+30	0.0763	0.07	Q			V
5+31	0.0764	0.07	Q			V
5+32	0.0765	0.07	Q			V
5+33	0.0766	0.07	Q			V
5+34	0.0767	0.07	Q			V
5+35	0.0768	0.07	Q			V
5+36	0.0769	0.07	Q			V
5+37	0.0770	0.07	Q			V
5+38	0.0770	0.07	Q			V
5+39	0.0771	0.07	Q			V
5+40	0.0772	0.07	Q			V
5+41	0.0773	0.07	Q			V
5+42	0.0774	0.07	Q			V
5+43	0.0775	0.07	Q			V
5+44	0.0776	0.07	Q			V
5+45	0.0777	0.07	Q			V
5+46	0.0778	0.07	Q			V
5+47	0.0779	0.07	Q			V
5+48	0.0780	0.07	Q			V
5+49	0.0781	0.06	Q			V
5+50	0.0781	0.06	Q			V
5+51	0.0782	0.06	Q			V
5+52	0.0783	0.06	Q			V
5+53	0.0784	0.06	Q			V
5+54	0.0785	0.06	Q			V
5+55	0.0786	0.06	Q			V
5+56	0.0787	0.06	Q			V
5+57	0.0788	0.06	Q			V
5+58	0.0788	0.06	Q			V
5+59	0.0789	0.06	Q			V
6+ 0	0.0790	0.06	Q			V
6+ 1	0.0791	0.06	Q			V
6+ 2	0.0792	0.06	Q			V
6+ 3	0.0793	0.06	Q			V
6+ 4	0.0793	0.06	Q			V
6+ 5	0.0794	0.06	Q			V
6+ 6	0.0795	0.06	Q			V
6+ 7	0.0796	0.06	Q			V
6+ 8	0.0797	0.06	Q			V

End of computations, total study area = 0.710 (Ac.)

PR1CSOUTHDET

FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 05/01/17

Program License Serial Number 6313

***** HYDROGRAPH INFORMATION *****

From study/file name: PR1CSOUTHHYD.rte
*****HYDROGRAPH DATA*****
Number of intervals = 370
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 1.552 (CFS)
Total volume = 0.080 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

+++++
Process from Point/Station 303.000 to Point/Station 102.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 370
Hydrograph time unit = 1.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:
Basin Depth Storage Outflow (S-0*dt/2) (S+0*dt/2)
(Ft.) (Ac.Ft) (CFS) (Ac.Ft) (Ac.Ft)

0.000 0.000 0.000 0.000 0.000
0.500 0.011 0.350 0.011 0.011
1.000 0.024 0.580 0.024 0.024

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	0	0.4	0.78	1.16	1.55	Depth (Ft.)

PR1CSOUTHDET									
0.017	0.01	0.00	0.000	0					0.00
0.033	0.01	0.00	0.000	0					0.00
0.050	0.02	0.00	0.000	0					0.00
0.067	0.02	0.00	0.000	0					0.00
0.083	0.03	0.00	0.000	0					0.00
0.100	0.03	0.00	0.000	0					0.01
0.117	0.04	0.01	0.000	0					0.01
0.133	0.05	0.01	0.000	0					0.01
0.150	0.05	0.01	0.000	OI					0.01
0.167	0.06	0.01	0.000	OI					0.02
0.183	0.06	0.01	0.000	OI					0.02
0.200	0.06	0.02	0.000	OI					0.02
0.217	0.06	0.02	0.001	OI					0.02
0.233	0.06	0.02	0.001	OI					0.03
0.250	0.06	0.02	0.001	OI					0.03
0.267	0.06	0.02	0.001	OI					0.03
0.283	0.06	0.02	0.001	OI					0.03
0.300	0.06	0.03	0.001	OI					0.04
0.317	0.06	0.03	0.001	OI					0.04
0.333	0.06	0.03	0.001	OI					0.04
0.350	0.06	0.03	0.001	OI					0.04
0.367	0.06	0.03	0.001	OI					0.04
0.383	0.06	0.03	0.001	OI					0.05
0.400	0.06	0.03	0.001	OI					0.05
0.417	0.06	0.03	0.001	OI					0.05
0.433	0.06	0.04	0.001	OI					0.05
0.450	0.06	0.04	0.001	OI					0.05
0.467	0.06	0.04	0.001	OI					0.05
0.483	0.06	0.04	0.001	OI					0.06
0.500	0.06	0.04	0.001	OI					0.06
0.517	0.06	0.04	0.001	OI					0.06
0.533	0.06	0.04	0.001	OI					0.06
0.550	0.06	0.04	0.001	OI					0.06
0.567	0.06	0.04	0.001	OI					0.06
0.583	0.06	0.04	0.001	OI					0.06
0.600	0.06	0.04	0.001	OI					0.06
0.617	0.06	0.05	0.001	OI					0.07
0.633	0.06	0.05	0.001	OI					0.07
0.650	0.06	0.05	0.001	OI					0.07
0.667	0.06	0.05	0.001	OI					0.07
0.683	0.06	0.05	0.002	OI					0.07
0.700	0.06	0.05	0.002	0					0.07
0.717	0.06	0.05	0.002	0					0.07
0.733	0.06	0.05	0.002	0					0.07
0.750	0.06	0.05	0.002	0					0.07
0.767	0.06	0.05	0.002	0					0.07
0.783	0.06	0.05	0.002	0					0.07
0.800	0.07	0.05	0.002	0					0.07
0.817	0.07	0.05	0.002	0					0.08
0.833	0.07	0.05	0.002	0					0.08
0.850	0.07	0.05	0.002	0					0.08
0.867	0.07	0.05	0.002	0					0.08
0.883	0.07	0.06	0.002	0					0.08
0.900	0.07	0.06	0.002	0					0.08
0.917	0.07	0.06	0.002	0					0.08
0.933	0.07	0.06	0.002	0					0.08
0.950	0.07	0.06	0.002	0					0.08
0.967	0.07	0.06	0.002	0					0.08
0.983	0.07	0.06	0.002	0					0.08
1.000	0.07	0.06	0.002	0					0.08
1.017	0.07	0.06	0.002	0					0.08
1.033	0.07	0.06	0.002	0					0.08
1.050	0.07	0.06	0.002	0					0.08

PR1CSOUTHDET									
1.067	0.07	0.06	0.002	0					0.09
1.083	0.07	0.06	0.002	0					0.09
1.100	0.07	0.06	0.002	0					0.09
1.117	0.07	0.06	0.002	0					0.09
1.133	0.07	0.06	0.002	0					0.09
1.150	0.07	0.06	0.002	0					0.09
1.167	0.07	0.06	0.002	0					0.09
1.183	0.07	0.06	0.002	0					0.09
1.200	0.07	0.06	0.002	0					0.09
1.217	0.07	0.06	0.002	0					0.09
1.233	0.07	0.06	0.002	0					0.09
1.250	0.07	0.06	0.002	0					0.09
1.267	0.07	0.06	0.002	0					0.09
1.283	0.07	0.06	0.002	0					0.09
1.300	0.07	0.06	0.002	0					0.09
1.317	0.07	0.06	0.002	0					0.09
1.333	0.07	0.07	0.002	0					0.09
1.350	0.07	0.07	0.002	0					0.09
1.367	0.07	0.07	0.002	0					0.09
1.383	0.07	0.07	0.002	0					0.09
1.400	0.07	0.07	0.002	0					0.09
1.417	0.07	0.07	0.002	0					0.10
1.433	0.07	0.07	0.002	0					0.10
1.450	0.07	0.07	0.002	0					0.10
1.467	0.08	0.07	0.002	0					0.10
1.483	0.08	0.07	0.002	0					0.10
1.500	0.08	0.07	0.002	0					0.10
1.517	0.08	0.07	0.002	0					0.10
1.533	0.08	0.07	0.002	0					0.10
1.550	0.08	0.07	0.002	0					0.10
1.567	0.08	0.07	0.002	0					0.10
1.583	0.08	0.07	0.002	0					0.10
1.600	0.08	0.07	0.002	0					0.10
1.617	0.08	0.07	0.002	0					0.10
1.633	0.08	0.07	0.002	0					0.10
1.650	0.08	0.07	0.002	0					0.10
1.667	0.08	0.07	0.002	0					0.10
1.683	0.08	0.07	0.002	0					0.10
1.700	0.08	0.07	0.002	0					0.10
1.717	0.08	0.07	0.002	0					0.10
1.733	0.08	0.07	0.002	0					0.10
1.750	0.08	0.07	0.002	0					0.10
1.767	0.08	0.07	0.002	0					0.10
1.783	0.08	0.07	0.002	0					0.11
1.800	0.08	0.07	0.002	0					0.11
1.817	0.08	0.07	0.002	0					0.11
1.833	0.08	0.07	0.002	0					0.11
1.850	0.08	0.08	0.002	0					0.11
1.867	0.08	0.08	0.002	0					0.11
1.883	0.08	0.08	0.002	0					0.11
1.900	0.08	0.08	0.002	0					0.11
1.917	0.08	0.08	0.002	0					0.11
1.933	0.08	0.08	0.002	0					0.11
1.950	0.08	0.08	0.002	0					0.11
1.967	0.09	0.08	0.002	0					0.11
1.983	0.09	0.08	0.002	0					0.11
2.000	0.09	0.08	0.002	0					0.11
2.017	0.09	0.08	0.002	0					0.11
2.033	0.09	0.08	0.002	0					0.11
2.050	0.09	0.08	0.002	0					0.11
2.067	0.09	0.08	0.003	0					0.11
2.083	0.09	0.08	0.003	0					0.11
2.100	0.09	0.08	0.003	0					0.11

PR1CSOUTHDET

2.117	0.09	0.08	0.003	0					0.12
2.133	0.09	0.08	0.003	0					0.12
2.150	0.09	0.08	0.003	0					0.12
2.167	0.09	0.08	0.003	0					0.12
2.183	0.09	0.08	0.003	0					0.12
2.200	0.09	0.08	0.003	0					0.12
2.217	0.09	0.08	0.003	0					0.12
2.233	0.09	0.08	0.003	0					0.12
2.250	0.09	0.08	0.003	0					0.12
2.267	0.09	0.08	0.003	0					0.12
2.283	0.09	0.08	0.003	0					0.12
2.300	0.09	0.09	0.003	0					0.12
2.317	0.10	0.09	0.003	0					0.12
2.333	0.10	0.09	0.003	0					0.12
2.350	0.10	0.09	0.003	0					0.12
2.367	0.10	0.09	0.003	OI					0.12
2.383	0.10	0.09	0.003	OI					0.13
2.400	0.10	0.09	0.003	OI					0.13
2.417	0.10	0.09	0.003	OI					0.13
2.433	0.10	0.09	0.003	OI					0.13
2.450	0.10	0.09	0.003	OI					0.13
2.467	0.10	0.09	0.003	OI					0.13
2.483	0.10	0.09	0.003	OI					0.13
2.500	0.10	0.09	0.003	OI					0.13
2.517	0.10	0.09	0.003	OI					0.13
2.533	0.10	0.09	0.003	OI					0.13
2.550	0.11	0.09	0.003	OI					0.13
2.567	0.11	0.09	0.003	OI					0.13
2.583	0.11	0.09	0.003	OI					0.13
2.600	0.11	0.09	0.003	OI					0.13
2.617	0.11	0.09	0.003	OI					0.14
2.633	0.11	0.10	0.003	OI					0.14
2.650	0.11	0.10	0.003	OI					0.14
2.667	0.11	0.10	0.003	OI					0.14
2.683	0.11	0.10	0.003	0					0.14
2.700	0.11	0.10	0.003	0					0.14
2.717	0.11	0.10	0.003	0					0.14
2.733	0.11	0.10	0.003	0					0.14
2.750	0.11	0.10	0.003	0					0.14
2.767	0.12	0.10	0.003	0					0.14
2.783	0.12	0.10	0.003	0					0.14
2.800	0.12	0.10	0.003	0					0.15
2.817	0.12	0.10	0.003	0					0.15
2.833	0.12	0.10	0.003	0					0.15
2.850	0.12	0.10	0.003	0					0.15
2.867	0.12	0.10	0.003	0					0.15
2.883	0.12	0.11	0.003	0					0.15
2.900	0.12	0.11	0.003	0					0.15
2.917	0.12	0.11	0.003	0					0.15
2.933	0.12	0.11	0.003	0					0.15
2.950	0.13	0.11	0.003	0					0.15
2.967	0.13	0.11	0.003	0					0.16
2.983	0.13	0.11	0.003	0					0.16
3.000	0.13	0.11	0.003	0					0.16
3.017	0.13	0.11	0.004	0					0.16
3.033	0.13	0.11	0.004	0					0.16
3.050	0.13	0.11	0.004	0					0.16
3.067	0.14	0.11	0.004	0					0.16
3.083	0.14	0.11	0.004	0					0.16
3.100	0.14	0.12	0.004	0					0.17
3.117	0.14	0.12	0.004	0					0.17
3.133	0.14	0.12	0.004	0					0.17
3.150	0.14	0.12	0.004	0					0.17

PR1CSOUTHDET

3.167	0.15	0.12	0.004	OI						0.17
3.183	0.15	0.12	0.004	OI						0.17
3.200	0.15	0.12	0.004	OI						0.18
3.217	0.15	0.12	0.004	OI						0.18
3.233	0.15	0.12	0.004	OI						0.18
3.250	0.15	0.13	0.004	OI						0.18
3.267	0.15	0.13	0.004	OI						0.18
3.283	0.16	0.13	0.004	OI						0.18
3.300	0.16	0.13	0.004	OI						0.19
3.317	0.16	0.13	0.004	OI						0.19
3.333	0.16	0.13	0.004	OI						0.19
3.350	0.16	0.13	0.004	OI						0.19
3.367	0.17	0.13	0.004	OI						0.19
3.383	0.17	0.14	0.004	OI						0.19
3.400	0.17	0.14	0.004	OI						0.20
3.417	0.18	0.14	0.004	OI						0.20
3.433	0.18	0.14	0.004	OI						0.20
3.450	0.18	0.14	0.004	OI						0.20
3.467	0.19	0.14	0.005	OI						0.21
3.483	0.19	0.15	0.005	O						0.21
3.500	0.19	0.15	0.005	OI						0.21
3.517	0.20	0.15	0.005	OI						0.21
3.533	0.20	0.15	0.005	OI						0.22
3.550	0.20	0.15	0.005	OI						0.22
3.567	0.20	0.16	0.005	OI						0.22
3.583	0.21	0.16	0.005	OI						0.23
3.600	0.21	0.16	0.005	OI						0.23
3.617	0.21	0.16	0.005	OI						0.23
3.633	0.22	0.17	0.005	OI						0.24
3.650	0.22	0.17	0.005	OI						0.24
3.667	0.22	0.17	0.005	OI						0.24
3.683	0.23	0.17	0.005	OI						0.25
3.700	0.24	0.17	0.005	OI						0.25
3.717	0.25	0.18	0.006	O I						0.25
3.733	0.26	0.18	0.006	O I						0.26
3.750	0.27	0.19	0.006	O I						0.26
3.767	0.28	0.19	0.006	O I						0.27
3.783	0.29	0.19	0.006	O I						0.28
3.800	0.30	0.20	0.006	O I						0.28
3.817	0.31	0.20	0.006	O I						0.29
3.833	0.32	0.21	0.007	O I						0.30
3.850	0.34	0.21	0.007	O I						0.30
3.867	0.35	0.22	0.007	O I						0.31
3.883	0.36	0.22	0.007	O I						0.32
3.900	0.38	0.23	0.007	O I						0.33
3.917	0.39	0.24	0.007	O I						0.34
3.933	0.40	0.24	0.008	O I						0.35
3.950	0.42	0.25	0.008	O I						0.36
3.967	0.43	0.26	0.008	O I						0.37
3.983	0.44	0.27	0.008	O I						0.38
4.000	0.46	0.27	0.009	O I						0.39
4.017	0.57	0.28	0.009	O I						0.41
4.033	0.68	0.30	0.009	O I						0.43
4.050										

				PR1CSOUTHDET							
4.217	1.16	0.53	0.021			0			I		0.89
4.233	1.04	0.54	0.022			0					0.92
4.250	0.91	0.55	0.022			0		I			0.94
4.267	0.78	0.56	0.023			0		I			0.95
4.283	0.65	0.56	0.023			0	I				0.96
4.300	0.52	0.56	0.023			10					0.96
4.317	0.39	0.56	0.023		I	0					0.96
4.333	0.26	0.55	0.023		I	0					0.95
4.350	0.25	0.55	0.022		I	0					0.93
4.367	0.24	0.54	0.022		I	0					0.91
4.383	0.23	0.53	0.021		I	0					0.90
4.400	0.23	0.53	0.021		I	0					0.88
4.417	0.22	0.52	0.021		I	0					0.87
4.433	0.21	0.51	0.020		I	0					0.85
4.450	0.20	0.50	0.020		I	0					0.83
4.467	0.19	0.50	0.019		I	0					0.82
4.483	0.18	0.49	0.019		I	0					0.80
4.500	0.17	0.48	0.018		I	0					0.79
4.517	0.17	0.47	0.018		I	0					0.77
4.533	0.17	0.47	0.018		I	0					0.75
4.550	0.16	0.46	0.017		I	0					0.74
4.567	0.16	0.45	0.017		I	0					0.72
4.583	0.16	0.45	0.016		I	0					0.71
4.600	0.15	0.44	0.016		I	0					0.69
4.617	0.15	0.43	0.016		I	0					0.68
4.633	0.14	0.42	0.015		I	0					0.66
4.650	0.14	0.42	0.015		I	0					0.65
4.667	0.14	0.41	0.014		I	0					0.63
4.683	0.13	0.40	0.014		I	0					0.62
4.700	0.13	0.40	0.014		I	0					0.60
4.717	0.13	0.39	0.013		I	0					0.59
4.733	0.13	0.38	0.013		I	0					0.58
4.750	0.13	0.38	0.013		I	0					0.56
4.767	0.12	0.37	0.012		I	0					0.55
4.783	0.12	0.37	0.012		I	0					0.54
4.800	0.12	0.36	0.012		I	0					0.52
4.817	0.12	0.35	0.011		I	0					0.51
4.833	0.11	0.35	0.011		I	0					0.50
4.850	0.11	0.34	0.011		I	0					0.48
4.867	0.11	0.33	0.010		I	0					0.47
4.883	0.11	0.32	0.010		I	0					0.46
4.900	0.11	0.31	0.010		I	0					0.44
4.917	0.11	0.30	0.009		I	0					0.43
4.933	0.11	0.29	0.009		I	0					0.42
4.950	0.10	0.28	0.009		I	0					0.41
4.967	0.10	0.28	0.009		I	0					0.40
4.983	0.10	0.27	0.008		I	0					0.39
5.000	0.10	0.26	0.008		I	0					0.37
5.017	0.10	0.26	0.008		I	0					0.36
5.033	0.10	0.25	0.008		I	0					0.35
5.050	0.10	0.24	0.008		I	0					0.35
5.067	0.10	0.24	0.007		I	0					0.34
5.083	0.09	0.23	0.007		I	0					0.33
5.100	0.09	0.22	0.007		I	0					0.32
5.117	0.09	0.22	0.007		I	0					0.31
5.133	0.09	0.21	0.007		I	0					0.30
5.150	0.09	0.21	0.007		I	0					0.30
5.167	0.09	0.20	0.006		I	0					0.29
5.183	0.09	0.20	0.006		I	0					0.28
5.200	0.09	0.19	0.006		I	0					0.28
5.217	0.09	0.19	0.006		I	0					0.27
5.233	0.09	0.18	0.006		I	0					0.26
5.250	0.08	0.18	0.006		I	0					0.26

PR1CSOUTHDET

5.267	0.08	0.18	0.006	I 0					0.25
5.283	0.08	0.17	0.005	I 0					0.25
5.300	0.08	0.17	0.005	I 0					0.24
5.317	0.08	0.16	0.005	I 0					0.23
5.333	0.08	0.16	0.005	I 0					0.23
5.350	0.08	0.16	0.005	I 0					0.22
5.367	0.08	0.15	0.005	I 0					0.22
5.383	0.08	0.15	0.005	I 0					0.21
5.400	0.08	0.15	0.005	I 0					0.21
5.417	0.08	0.14	0.005	IO					0.21
5.433	0.08	0.14	0.004	IO					0.20
5.450	0.08	0.14	0.004	IO					0.20
5.467	0.08	0.14	0.004	IO					0.19
5.483	0.07	0.13	0.004	IO					0.19
5.500	0.07	0.13	0.004	IO					0.19
5.517	0.07	0.13	0.004	IO					0.18
5.533	0.07	0.13	0.004	IO					0.18
5.550	0.07	0.12	0.004	IO					0.18
5.567	0.07	0.12	0.004	IO					0.17
5.583	0.07	0.12	0.004	IO					0.17
5.600	0.07	0.12	0.004	IO					0.17
5.617	0.07	0.12	0.004	IO					0.16
5.633	0.07	0.11	0.004	IO					0.16
5.650	0.07	0.11	0.004	IO					0.16
5.667	0.07	0.11	0.003	IO					0.16
5.683	0.07	0.11	0.003	IO					0.15
5.700	0.07	0.11	0.003	IO					0.15
5.717	0.07	0.10	0.003	IO					0.15
5.733	0.07	0.10	0.003	IO					0.15
5.750	0.07	0.10	0.003	IO					0.14
5.767	0.07	0.10	0.003	IO					0.14
5.783	0.07	0.10	0.003	IO					0.14
5.800	0.07	0.10	0.003	O					0.14
5.817	0.06	0.10	0.003	O					0.14
5.833	0.06	0.09	0.003	O					0.13
5.850	0.06	0.09	0.003	O					0.13
5.867	0.06	0.09	0.003	O					0.13
5.883	0.06	0.09	0.003	O					0.13
5.900	0.06	0.09	0.003	O					0.13
5.917	0.06	0.09	0.003	O					0.13
5.933	0.06	0.09	0.003	O					0.12
5.950	0.06	0.09	0.003	O					0.12
5.967	0.06	0.08	0.003	O					0.12
5.983	0.06	0.08	0.003	O					0.12
6.000	0.06	0.08	0.003	O					0.12
6.017	0.06	0.08	0.003	O					0.12
6.033	0.06	0.08	0.003	O					0.12
6.050	0.06	0.08	0.003	O					0.11
6.067	0.06	0.08	0.002	O					0.11
6.083	0.06	0.08	0.002	O					0.11
6.100	0.06	0.08	0.002	O					0.11
6.117	0.06	0.08	0.002	O					0.11
6.133	0.06	0.08	0.002	O					0.11
6.150	0.06	0.08	0.002	O					0.11
6.167	0.06	0.07	0.002	O					0.11
6.183	0.00	0.07	0.002	IO					0.10
6.200	0.00	0.07	0.002	IO					0.10
6.217	0.00	0.07	0.002	IO					0.09
6.233	0.00	0.06	0.002	IO					0.09
6.250	0.00	0.06	0.002	IO					0.09
6.267	0.00	0.06	0.002	IO					0.08
6.283	0.00	0.06	0.002	IO					0.08
6.300	0.00	0.05	0.002	IO					0.08

PR1CSOUTHDET									
6.317	0.00	0.05	0.002	IO					0.07
6.333	0.00	0.05	0.002	IO					0.07
6.350	0.00	0.05	0.001	0					0.07
6.367	0.00	0.04	0.001	0					0.06
6.383	0.00	0.04	0.001	0					0.06
6.400	0.00	0.04	0.001	0					0.06
6.417	0.00	0.04	0.001	0					0.06
6.433	0.00	0.04	0.001	0					0.05
6.450	0.00	0.04	0.001	0					0.05
6.467	0.00	0.03	0.001	0					0.05
6.483	0.00	0.03	0.001	0					0.05
6.500	0.00	0.03	0.001	0					0.04
6.517	0.00	0.03	0.001	0					0.04
6.533	0.00	0.03	0.001	0					0.04
6.550	0.00	0.03	0.001	0					0.04
6.567	0.00	0.03	0.001	0					0.04
6.583	0.00	0.03	0.001	0					0.04
6.600	0.00	0.02	0.001	0					0.03
6.617	0.00	0.02	0.001	0					0.03
6.633	0.00	0.02	0.001	0					0.03
6.650	0.00	0.02	0.001	0					0.03
6.667	0.00	0.02	0.001	0					0.03
6.683	0.00	0.02	0.001	0					0.03
6.700	0.00	0.02	0.001	0					0.03
6.717	0.00	0.02	0.001	0					0.03
6.733	0.00	0.02	0.001	0					0.02
6.750	0.00	0.02	0.001	0					0.02
6.767	0.00	0.02	0.000	0					0.02
6.783	0.00	0.01	0.000	0					0.02
6.800	0.00	0.01	0.000	0					0.02
6.817	0.00	0.01	0.000	0					0.02
6.833	0.00	0.01	0.000	0					0.02
6.850	0.00	0.01	0.000	0					0.02
6.867	0.00	0.01	0.000	0					0.02
6.883	0.00	0.01	0.000	0					0.02
6.900	0.00	0.01	0.000	0					0.02
6.917	0.00	0.01	0.000	0					0.02
6.933	0.00	0.01	0.000	0					0.01
6.950	0.00	0.01	0.000	0					0.01
6.967	0.00	0.01	0.000	0					0.01
6.983	0.00	0.01	0.000	0					0.01
7.000	0.00	0.01	0.000	0					0.01
7.017	0.00	0.01	0.000	0					0.01
7.033	0.00	0.01	0.000	0					0.01
7.050	0.00	0.01	0.000	0					0.01
7.067	0.00	0.01	0.000	0					0.01
7.083	0.00	0.01	0.000	0					0.01
7.100	0.00	0.01	0.000	0					0.01
7.117	0.00	0.01	0.000	0					0.01
7.133	0.00	0.01	0.000	0					0.01
7.150	0.00	0.01	0.000	0					0.01
7.167	0.00	0.01	0.000	0					0.01
7.183	0.00	0.01	0.000	0					0.01
7.200	0.00	0.00	0.000	0					0.01
7.217	0.00	0.00	0.000	0					0.01
7.233	0.00	0.00	0.000	0					0.01
7.250	0.00	0.00	0.000	0					0.01
7.267	0.00	0.00	0.000	0					0.01
7.283	0.00	0.00	0.000	0					0.01
7.300	0.00	0.00	0.000	0					0.01
7.317	0.00	0.00	0.000	0					0.01
7.333	0.00	0.00	0.000	0					0.01
7.350	0.00	0.00	0.000	0					0.00

PR1CSOUTHDET					
7.367	0.00	0.00	0.000	0	0.00
7.383	0.00	0.00	0.000	0	0.00
7.400	0.00	0.00	0.000	0	0.00
7.417	0.00	0.00	0.000	0	0.00
7.433	0.00	0.00	0.000	0	0.00
7.450	0.00	0.00	0.000	0	0.00
7.467	0.00	0.00	0.000	0	0.00
7.483	0.00	0.00	0.000	0	0.00
7.500	0.00	0.00	0.000	0	0.00
7.517	0.00	0.00	0.000	0	0.00
7.533	0.00	0.00	0.000	0	0.00
7.550	0.00	0.00	0.000	0	0.00
7.567	0.00	0.00	0.000	0	0.00
7.583	0.00	0.00	0.000	0	0.00
7.600	0.00	0.00	0.000	0	0.00
7.617	0.00	0.00	0.000	0	0.00
7.633	0.00	0.00	0.000	0	0.00
7.650	0.00	0.00	0.000	0	0.00
7.667	0.00	0.00	0.000	0	0.00
7.683	0.00	0.00	0.000	0	0.00
7.700	0.00	0.00	0.000	0	0.00
7.717	0.00	0.00	0.000	0	0.00
7.733	0.00	0.00	0.000	0	0.00
7.750	0.00	0.00	0.000	0	0.00
7.767	0.00	0.00	0.000	0	0.00
7.783	0.00	0.00	0.000	0	0.00
7.800	0.00	0.00	0.000	0	0.00
7.817	0.00	0.00	0.000	0	0.00

```

*****HYDROGRAPH DATA*****
      Number of intervals = 469
      Time interval = 1.0 (Min.)
      Maximum/Peak flow rate = 0.563 (CFS)
      Total volume = 0.080 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****

```

PR1CSOUTHRROUTE

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 402.000 to Point/Station 303.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.460 given for subarea
Rainfall intensity (I) = 3.202(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 18.24 min. Rain intensity = 3.20(In/Hr)
Total area = 0.710(Ac.) Total runoff = 0.563(CFS)

+++++
Process from Point/Station 303.000 to Point/Station 102.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 388.400(Ft.)
Downstream point/station elevation = 388.000(Ft.)
Pipe length = 85.00(Ft.) Slope = 0.0047 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.563(CFS)
Given pipe size = 6.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
0.647(Ft.) at the headworks or inlet of the pipe(s)
Pipe friction loss = 0.855(Ft.)
Minor friction loss = 0.191(Ft.) K-factor = 1.50
Pipe flow velocity = 2.87(Ft/s)
Travel time through pipe = 0.49 min.
Time of concentration (TC) = 18.73 min.

+++++
Process from Point/Station 303.000 to Point/Station 102.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1

PR1CSOUTHRROUTE
 Stream flow area = 0.710(Ac.)
 Runoff from this stream = 0.563(CFS)
 Time of concentration = 18.73 min.
 Rainfall intensity = 3.147(In/Hr)
 Program is now starting with Main Stream No. 2

 Process from Point/Station 101.000 to Point/Station 102.000
 **** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 [UNDISTURBED NATURAL TERRAIN]
 (Permanent Open Space)
 Impervious value, Ai = 0.000
 Sub-Area C Value = 0.350
 Initial subarea total flow distance = 1141.000(Ft.)
 Highest elevation = 438.500(Ft.)
 Lowest elevation = 388.000(Ft.)
 Elevation difference = 50.500(Ft.) Slope = 4.426 %
 INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
 The maximum overland flow distance is 100.00 (Ft)
 for the top area slope value of 4.43 %, in a development type of
 Permanent Open Space
 In Accordance With Figure 3-3
 Initial Area Time of Concentration = 8.22 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{1.5} / (\% slope^{1/3})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{1.5}) / (4.426^{1/3})] = 8.22$
 The initial area total distance of 1141.00 (Ft.) entered leaves a
 remaining distance of 1041.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 5.46 minutes
 for a distance of 1041.00 (Ft.) and a slope of 4.43 %
 with an elevation difference of 46.07(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
 $= 5.462 \text{ Minutes}$
 $Tt = [(11.9 * 0.1972^3) / (46.07)]^{.385} = 5.46$
 Total initial area Ti = 8.22 minutes from Figure 3-3 formula plus
 5.46 minutes from the Figure 3-4 formula = 13.68 minutes
 Rainfall intensity (I) = 3.854(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
 Subarea runoff = 10.615(CFS)
 Total initial stream area = 7.870(Ac.)

 Process from Point/Station 101.000 to Point/Station 102.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 7.870(Ac.)
 Runoff from this stream = 10.615(CFS)
 Time of concentration = 13.68 min.
 Rainfall intensity = 3.854(In/Hr)
 Summary of stream data:

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

			PR1CSOUTHRROUTE	
1	0.563	18.73		3.147
2	10.615	13.68		3.854
Qmax(1) =				
	1.000 *	1.000 *	0.563) +	
	0.817 *	1.000 *	10.615) + =	9.231
Qmax(2) =				
	1.000 *	0.730 *	0.563) +	
	1.000 *	1.000 *	10.615) + =	11.026
Total of 2 main streams to confluence:				
Flow rates before confluence point:				
	0.563	10.615		
Maximum flow rates at confluence using above data:				
	9.231	11.026		
Area of streams before confluence:				
	0.710	7.870		
Results of confluence:				
Total flow rate =			11.026(CFS)	
Time of concentration =			13.684 min.	
Effective stream area after confluence =			8.580(Ac.)	
End of computations, total study area =			8.580 (Ac.)	

PR4ASOUTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.9 DU/A or Less)
Impervious value, Ai = 0.250
Sub-Area C Value = 0.490
Initial subarea total flow distance = 216.000(Ft.)
Highest elevation = 358.900(Ft.)
Lowest elevation = 355.500(Ft.)
Elevation difference = 3.400(Ft.) Slope = 1.574 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.57 %, in a development type of
2.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.70 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4900) * (85.000^{.5}) / (1.574^{(1/3)})] = 8.70$
The initial area total distance of 216.00 (Ft.) entered leaves a
remaining distance of 131.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.65 minutes
for a distance of 131.00 (Ft.) and a slope of 1.57 %
with an elevation difference of 2.06(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 1.648 Minutes
 $Tt = [(11.9 * 0.0248^3) / (2.06)]^{.385} = 1.65$
Total initial area Ti = 8.70 minutes from Figure 3-3 formula plus
1.65 minutes from the Figure 3-4 formula = 10.35 minutes
Rainfall intensity (I) = 4.614(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.490

PR4ASOUTH
Subarea runoff = 1.546(CFS)
Total initial stream area = 0.684(Ac.)
End of computations, total study area = 0.684 (Ac.)

PR4BSOUTH

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.490 given for subarea
Rainfall intensity (I) = 5.161(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 8.70 min. Rain intensity = 5.16(In/Hr)
Total area = 0.684(Ac.) Total runoff = 1.546(CFS)

+++++
Process from Point/Station 202.000 to Point/Station 203.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 351.500(Ft.)
Downstream point/station elevation = 350.000(Ft.)
Pipe length = 66.00(Ft.) Slope = 0.0227 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 1.546(CFS)
Given pipe size = 8.00(In.)
Calculated individual pipe flow = 1.546(CFS)
Normal flow depth in pipe = 5.66(In.)
Flow top width inside pipe = 7.28(In.)
Critical Depth = 6.95(In.)
Pipe flow velocity = 5.86(Ft/s)
Travel time through pipe = 0.19 min.
Time of concentration (TC) = 8.89 min.

+++++
Process from Point/Station 202.000 to Point/Station 203.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 0.684(Ac.)

PR4BSOUTH
 Runoff from this stream = 1.546(CFS)
 Time of concentration = 8.89 min.
 Rainfall intensity = 5.090(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	1.546	8.89	5.090

Qmax(1) = 1.000 * 1.000 * 1.546) + = 1.546

Total of 1 main streams to confluence:
 Flow rates before confluence point:

1.546
 Maximum flow rates at confluence using above data:
 1.546
 Area of streams before confluence:
 0.684

Results of confluence:

Total flow rate = 1.546(CFS)
 Time of concentration = 8.888 min.
 Effective stream area after confluence = 0.684(Ac.)

 Process from Point/Station 101.000 to Point/Station 203.000
 **** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 [UNDISTURBED NATURAL TERRAIN]
 (Permanent Open Space)
 Impervious value, Ai = 0.000
 Sub-Area C Value = 0.350
 Initial subarea total flow distance = 1255.000(Ft.)
 Highest elevation = 438.000(Ft.)
 Lowest elevation = 328.000(Ft.)
 Elevation difference = 110.000(Ft.) Slope = 8.765 %
 INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
 The maximum overland flow distance is 100.00 (Ft)
 for the top area slope value of 8.77 %, in a development type of
 Permanent Open Space
 In Accordance With Figure 3-3
 Initial Area Time of Concentration = 6.55 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (8.765^{(1/3)})] = 6.55$
 The initial area total distance of 1255.00 (Ft.) entered leaves a
 remaining distance of 1155.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 4.55 minutes
 for a distance of 1155.00 (Ft.) and a slope of 8.77 %
 with an elevation difference of 101.24(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
 $= 4.548 \text{ Minutes}$
 $Tt = [(11.9 * 0.2188^3) / (101.24)]^{.385} = 4.55$
 Total initial area Ti = 6.55 minutes from Figure 3-3 formula plus
 4.55 minutes from the Figure 3-4 formula = 11.10 minutes
 Rainfall intensity (I) = 4.412(In/Hr) for a 100.0 year storm

PR4BSOUTH

Effective runoff coefficient used for area (Q=KCIA) is C = 0.350
 Subarea runoff = 24.709(CFS)
 Total initial stream area = 16.002(Ac.)

+++++
 Process from Point/Station 101.000 to Point/Station 203.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 16.002(Ac.)
 Runoff from this stream = 24.709(CFS)
 Time of concentration = 11.10 min.
 Rainfall intensity = 4.412(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	1.546	8.89	5.090
2	24.709	11.10	4.412
Qmax(1) =			
	1.000 *	1.000 *	1.546) +
	1.000 *	0.801 *	24.709) + = 21.338
Qmax(2) =			
	0.867 *	1.000 *	1.546) +
	1.000 *	1.000 *	24.709) + = 26.049

Total of 2 main streams to confluence:

Flow rates before confluence point:

1.546 24.709

Maximum flow rates at confluence using above data:

21.338 26.049

Area of streams before confluence:

0.684 16.002

Results of confluence:

Total flow rate = 26.049(CFS)

Time of concentration = 11.096 min.

Effective stream area after confluence = 16.686(Ac.)

End of computations, total study area = 16.686 (Ac.)

PR4CSOUTH

San Diego County Rational Hydrology Program

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Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 560.000(Ft.)
Highest elevation = 413.500(Ft.)
Lowest elevation = 359.300(Ft.)
Elevation difference = 54.200(Ft.) Slope = 9.679 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 9.68 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.33 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.3500) * (100.000^{.5}) / (9.679^{(1/3)})] = 6.33$
The initial area total distance of 560.00 (Ft.) entered leaves a
remaining distance of 460.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 2.15 minutes
for a distance of 460.00 (Ft.) and a slope of 9.68 %
with an elevation difference of 44.52(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 2.155 Minutes
 $Tt = [(11.9 * 0.0871^3) / (44.52)]^{.385} = 2.15$
Total initial area Ti = 6.33 minutes from Figure 3-3 formula plus
2.15 minutes from the Figure 3-4 formula = 8.49 minutes
Rainfall intensity (I) = 5.243(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.350

PR4CSOUTH
Subarea runoff = 3.182(CFS)
Total initial stream area = 1.734(Ac.)
End of computations, total study area = 1.734 (Ac.)

Detention Design

Pipe:

diameter 5 inches 0.42 ft
coefficient 0.013

$$Q = C_o A_o \sqrt{2g(H_o)} \quad (6-12)$$

where ...

Q = orifice flow discharge (ft³/s);
 C_o = orifice discharge coefficient;
 A_o = cross-sectional area of flow through the orifice (ft²);
 g = gravitational acceleration (32.2 ft/s²);
 H_o = effective head above orifice (ft); and

San Diego County Drainage Design Manual
July 2005

Page 6-11

C_o = 0.60 from Table 6.1 County Drainage Design Manual
 A_o = 0.14 sf
 g = 32.20 sf/sec
 C = 2.90

Stage	Depth (ft)	Effective Head (Ho)	Volume (cf)	Area (Ac.ft)	Orifice Flow (cfs)
354.50	0.00	0.00	0	0.000	0.00
355.00	0.50	0.29	599	0.014	0.35
355.50	1.00	0.79	1198	0.028	0.58

Hydrology Parameters

Before Detention
Q= 1.546 cfs
A= 0.684 Acre
Tc= 8.70 min.
C= 0.460
I= 4.700 in/hr

After Detention
 Δt = 7.00 min.
Q= 0.528 cfs
A= 0.684 Acre
Tc= 15.70 min.

PR4ASOUTHHD

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 05/01/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[LOW DENSITY RESIDENTIAL]
(2.9 DU/A or Less)
Impervious value, Ai = 0.250
Sub-Area C Value = 0.490
Initial subarea total flow distance = 216.000(Ft.)
Highest elevation = 358.900(Ft.)
Lowest elevation = 355.500(Ft.)
Elevation difference = 3.400(Ft.) Slope = 1.574 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of 1.57 %, in a development type of
2.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.70 minutes
 $TC = [1.8 * (1.1 - C) * distance(Ft.)^{.5} / (% slope^{(1/3)})]$
 $TC = [1.8 * (1.1 - 0.4900) * (85.000^{.5}) / (1.574^{(1/3)})] = 8.70$
The initial area total distance of 216.00 (Ft.) entered leaves a
remaining distance of 131.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.65 minutes
for a distance of 131.00 (Ft.) and a slope of 1.57 %
with an elevation difference of 2.06(Ft.) from the end of the top area
 $Tt = [11.9 * length(Mi)^3 / (elevation change(Ft.))]^{.385} * 60(min/hr)$
= 1.648 Minutes
 $Tt = [(11.9 * 0.0248^3) / (2.06)]^{.385} = 1.65$
Total initial area Ti = 8.70 minutes from Figure 3-3 formula plus
1.65 minutes from the Figure 3-4 formula = 10.35 minutes
Rainfall intensity (I) = 4.614(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.490

PR4ASOUTHHYD
Subarea runoff = 1.546(CFS)
Total initial stream area = 0.684(Ac.)

++++
Process from Point/Station 202.000 to Point/Station 203.000
**** 6 HOUR HYDROGRAPH ****

++++
Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 10.35
Basin Area = 0.68 Acres
6 Hour Rainfall = 2.800 Inches
Runoff Coefficient = 0.490
Peak Discharge = 1.55 CFS

Time (Min)	Discharge (CFS)
0	0.000
10	0.056
20	0.057
30	0.059
40	0.061
50	0.063
60	0.065
70	0.068
80	0.070
90	0.073
100	0.075
110	0.080
120	0.083
130	0.089
140	0.092
150	0.100
160	0.105
170	0.116
180	0.123
190	0.141
200	0.153
210	0.187
220	0.213
230	0.313
240	0.441
250	1.546
260	0.251
270	0.168
280	0.131
290	0.110
300	0.096
310	0.085
320	0.078
330	0.071
340	0.066
350	0.062
360	0.058
370	0.055

++++
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 1 Minute intervals ((CFS))

				PR4ASOUTH HYD				
Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	0.4	0.8	1.2	1.5
0+ 0	0.0000		0.00	Q				
0+ 1	0.0000		0.01	Q				
0+ 2	0.0000		0.01	Q				
0+ 3	0.0000		0.02	Q				
0+ 4	0.0001		0.02	Q				
0+ 5	0.0001		0.03	Q				
0+ 6	0.0002		0.03	Q				
0+ 7	0.0002		0.04	VQ				
0+ 8	0.0003		0.04	VQ				
0+ 9	0.0003		0.05	VQ				
0+10	0.0004		0.06	VQ				
0+11	0.0005		0.06	VQ				
0+12	0.0006		0.06	VQ				
0+13	0.0007		0.06	VQ				
0+14	0.0007		0.06	VQ				
0+15	0.0008		0.06	VQ				
0+16	0.0009		0.06	VQ				
0+17	0.0010		0.06	VQ				
0+18	0.0010		0.06	VQ				
0+19	0.0011		0.06	VQ				
0+20	0.0012		0.06	VQ				
0+21	0.0013		0.06	VQ				
0+22	0.0014		0.06	VQ				
0+23	0.0014		0.06	VQ				
0+24	0.0015		0.06	VQ				
0+25	0.0016		0.06	VQ				
0+26	0.0017		0.06	VQ				
0+27	0.0018		0.06	VQ				
0+28	0.0018		0.06	VQ				
0+29	0.0019		0.06	VQ				
0+30	0.0020		0.06	Q				
0+31	0.0021		0.06	Q				
0+32	0.0022		0.06	Q				
0+33	0.0023		0.06	Q				
0+34	0.0023		0.06	Q				
0+35	0.0024		0.06	Q				
0+36	0.0025		0.06	Q				
0+37	0.0026		0.06	Q				
0+38	0.0027		0.06	Q				
0+39	0.0028		0.06	Q				
0+40	0.0028		0.06	Q				
0+41	0.0029		0.06	Q				
0+42	0.0030		0.06	Q				
0+43	0.0031		0.06	Q				
0+44	0.0032		0.06	Q				
0+45	0.0033		0.06	Q				
0+46	0.0033		0.06	Q				
0+47	0.0034		0.06	Q				
0+48	0.0035		0.06	Q				
0+49	0.0036		0.06	Q				
0+50	0.0037		0.06	Q				
0+51	0.0038		0.06	Q				
0+52	0.0039		0.06	Q				
0+53	0.0040		0.06	QV				
0+54	0.0040		0.06	QV				
0+55	0.0041		0.06	QV				
0+56	0.0042		0.06	QV				
0+57	0.0043		0.06	QV				
0+58	0.0044		0.06	QV				
0+59	0.0045		0.06	QV				
1+ 0	0.0046		0.06	QV				

PR4ASOUTHHYD

1+ 1	0.0047	0.07	QV
1+ 2	0.0048	0.07	QV
1+ 3	0.0048	0.07	QV
1+ 4	0.0049	0.07	QV
1+ 5	0.0050	0.07	QV
1+ 6	0.0051	0.07	QV
1+ 7	0.0052	0.07	QV
1+ 8	0.0053	0.07	QV
1+ 9	0.0054	0.07	QV
1+10	0.0055	0.07	QV
1+11	0.0056	0.07	QV
1+12	0.0057	0.07	QV
1+13	0.0058	0.07	QV
1+14	0.0059	0.07	Q V
1+15	0.0060	0.07	Q V
1+16	0.0061	0.07	Q V
1+17	0.0062	0.07	Q V
1+18	0.0062	0.07	Q V
1+19	0.0063	0.07	Q V
1+20	0.0064	0.07	Q V
1+21	0.0065	0.07	Q V
1+22	0.0066	0.07	Q V
1+23	0.0067	0.07	Q V
1+24	0.0068	0.07	Q V
1+25	0.0069	0.07	Q V
1+26	0.0070	0.07	Q V
1+27	0.0071	0.07	Q V
1+28	0.0072	0.07	Q V
1+29	0.0073	0.07	Q V
1+30	0.0074	0.07	Q V
1+31	0.0075	0.07	Q V
1+32	0.0076	0.07	Q V
1+33	0.0077	0.07	Q V
1+34	0.0078	0.07	Q V
1+35	0.0079	0.07	Q V
1+36	0.0080	0.07	Q V
1+37	0.0081	0.07	Q V
1+38	0.0082	0.07	Q V
1+39	0.0083	0.08	Q V
1+40	0.0084	0.08	Q V
1+41	0.0086	0.08	Q V
1+42	0.0087	0.08	Q V
1+43	0.0088	0.08	Q V
1+44	0.0089	0.08	Q V
1+45	0.0090	0.08	Q V
1+46	0.0091	0.08	Q V
1+47	0.0092	0.08	Q V
1+48	0.0093	0.08	Q V
1+49	0.0094	0.08	Q V
1+50	0.0095	0.08	Q V
1+51	0.0096	0.08	Q V
1+52	0.0097	0.08	Q V
1+53	0.0099	0.08	Q V
1+54	0.0100	0.08	Q V
1+55	0.0101	0.08	Q V
1+56	0.0102	0.08	Q V
1+57	0.0103	0.08	Q V
1+58	0.0104	0.08	Q V
1+59	0.0105	0.08	Q V
2+ 0	0.0106	0.08	Q V
2+ 1	0.0108	0.08	Q V
2+ 2	0.0109	0.08	Q V
2+ 3	0.0110	0.08	Q V

PR4ASOUTHHYD

2+ 4	0.0111	0.09	Q	V			
2+ 5	0.0112	0.09	Q	V			
2+ 6	0.0113	0.09	Q	V			
2+ 7	0.0115	0.09	Q	V			
2+ 8	0.0116	0.09	Q	V			
2+ 9	0.0117	0.09	Q	V			
2+10	0.0118	0.09	Q	V			
2+11	0.0120	0.09	Q	V			
2+12	0.0121	0.09	Q	V			
2+13	0.0122	0.09	Q	V			
2+14	0.0123	0.09	Q	V			
2+15	0.0124	0.09	Q	V			
2+16	0.0126	0.09	Q	V			
2+17	0.0127	0.09	Q	V			
2+18	0.0128	0.09	Q	V			
2+19	0.0129	0.09	Q	V			
2+20	0.0131	0.09	Q	V			
2+21	0.0132	0.09	Q	V			
2+22	0.0133	0.09	Q	V			
2+23	0.0135	0.09	Q	V			
2+24	0.0136	0.10	Q	V			
2+25	0.0137	0.10	Q	V			
2+26	0.0139	0.10	Q	V			
2+27	0.0140	0.10	Q	V			
2+28	0.0141	0.10	Q	V			
2+29	0.0143	0.10	Q	V			
2+30	0.0144	0.10	Q	V			
2+31	0.0145	0.10	Q	V			
2+32	0.0147	0.10	Q	V			
2+33	0.0148	0.10	Q	V			
2+34	0.0150	0.10	Q	V			
2+35	0.0151	0.10	Q	V			
2+36	0.0152	0.10	Q	V			
2+37	0.0154	0.10	Q	V			
2+38	0.0155	0.10	Q	V			
2+39	0.0157	0.10	Q	V			
2+40	0.0158	0.10	Q	V			
2+41	0.0160	0.11	Q	V			
2+42	0.0161	0.11	Q	V			
2+43	0.0163	0.11	Q	V			
2+44	0.0164	0.11	Q	V			
2+45	0.0166	0.11	Q	V			
2+46	0.0167	0.11	Q	V			
2+47	0.0169	0.11	Q	V			
2+48	0.0170	0.11	Q	V			
2+49	0.0172	0.12	Q	V			
2+50	0.0173	0.12	Q	V			
2+51	0.0175	0.12	Q	V			
2+52	0.0177	0.12	Q	V			
2+53	0.0178	0.12	Q	V			
2+54	0.0180	0.12	Q	V			
2+55	0.0182	0.12	Q	V			
2+56	0.0183	0.12	Q	V			
2+57	0.0185	0.12	Q	V			
2+58	0.0187	0.12	Q	V			
2+59	0.0188	0.12	Q	V			
3+ 0	0.0190	0.12	Q	V			
3+ 1	0.0192	0.13	Q	V			
3+ 2	0.0193	0.13	Q	V			
3+ 3	0.0195	0.13	Q	V			
3+ 4	0.0197	0.13	Q	V			
3+ 5	0.0199	0.13	Q	V			
3+ 6	0.0201	0.13	Q	V			

			PR4ASOUTH HYD			
3+ 7	0.0203	0.14	Q	V		
3+ 8	0.0204	0.14	Q	V		
3+ 9	0.0206	0.14	Q	V		
3+10	0.0208	0.14	Q	V		
3+11	0.0210	0.14	Q	V		
3+12	0.0212	0.14	Q	V		
3+13	0.0214	0.14	Q	V		
3+14	0.0216	0.15	Q	V		
3+15	0.0218	0.15	Q	V		
3+16	0.0220	0.15	Q	V		
3+17	0.0222	0.15	Q	V		
3+18	0.0224	0.15	Q	V		
3+19	0.0227	0.15	Q	V		
3+20	0.0229	0.15	Q	V		
3+21	0.0231	0.16	Q	V		
3+22	0.0233	0.16	Q	V		
3+23	0.0235	0.16	Q	V		
3+24	0.0238	0.17	Q	V		
3+25	0.0240	0.17	Q	V		
3+26	0.0242	0.17	Q	V		
3+27	0.0245	0.18	Q	V		
3+28	0.0247	0.18	Q	V		
3+29	0.0250	0.18	Q	V		
3+30	0.0252	0.19	Q	V		
3+31	0.0255	0.19	Q	V		
3+32	0.0258	0.19	Q	V		
3+33	0.0260	0.20	Q	V		
3+34	0.0263	0.20	Q	V		
3+35	0.0266	0.20	Q	V		
3+36	0.0269	0.20	Q	V		
3+37	0.0271	0.21	Q	V		
3+38	0.0274	0.21	Q	V		
3+39	0.0277	0.21	Q	V		
3+40	0.0280	0.21	Q	V		
3+41	0.0283	0.22	Q	V		
3+42	0.0286	0.23	Q	V		
3+43	0.0290	0.24	Q	V		
3+44	0.0293	0.25	Q	V		
3+45	0.0297	0.26	Q	V		
3+46	0.0301	0.27	Q	V		
3+47	0.0305	0.28	Q	V		
3+48	0.0309	0.29	Q	V		
3+49	0.0313	0.30	Q	V		
3+50	0.0317	0.31	Q	V		
3+51	0.0322	0.33	Q	V		
3+52	0.0326	0.34	Q	V		
3+53	0.0331	0.35	Q	V		
3+54	0.0336	0.36	Q	V		
3+55	0.0341	0.38	Q	V		
3+56	0.0347	0.39	Q	V		
3+57	0.0352	0.40	Q	V		
3+58	0.0358	0.42	Q	V		
3+59	0.0364	0.43	Q	V		
4+ 0	0.0370	0.44	Q	V		
4+ 1	0.0377	0.55		Q		
4+ 2	0.0387	0.66		Q		
4+ 3	0.0397	0.77		Q		
4+ 4	0.0409	0.88		Q		
4+ 5	0.0423	0.99		Q		
4+ 6	0.0438	1.10		Q		
4+ 7	0.0455	1.21		Q		
4+ 8	0.0473	1.33		Q		
4+ 9	0.0493	1.44		Q		

			PR4ASOUTH HYD				
4+10	0.0514	1.55				V	
4+11	0.0534	1.42				V	
4+12	0.0552	1.29				V	Q
4+13	0.0568	1.16				Q	
4+14	0.0582	1.03				V	
4+15	0.0594	0.90			Q	V	
4+16	0.0605	0.77			Q		
4+17	0.0614	0.64			Q	V	
4+18	0.0621	0.51		Q		V	
4+19	0.0626	0.38		Q		V	
4+20	0.0629	0.25			Q	V	
4+21	0.0633	0.24			Q	V	
4+22	0.0636	0.23			Q	V	
4+23	0.0639	0.23			Q	V	
4+24	0.0642	0.22			Q	V	
4+25	0.0645	0.21			Q	V	
4+26	0.0648	0.20			Q	V	
4+27	0.0650	0.19			Q	V	
4+28	0.0653	0.18			Q	V	
4+29	0.0655	0.18			Q	V	
4+30	0.0658	0.17			Q	V	
4+31	0.0660	0.16			Q	V	
4+32	0.0662	0.16			Q	V	
4+33	0.0664	0.16			Q	V	
4+34	0.0666	0.15			Q	V	
4+35	0.0668	0.15			Q	V	
4+36	0.0670	0.15			Q	V	
4+37	0.0672	0.14			Q	V	
4+38	0.0674	0.14			Q	V	
4+39	0.0676	0.14			Q	V	
4+40	0.0678	0.13			Q	V	
4+41	0.0680	0.13			Q	V	
4+42	0.0681	0.13			Q	V	
4+43	0.0683	0.13			Q	V	
4+44	0.0685	0.12			Q	V	
4+45	0.0687	0.12			Q	V	
4+46	0.0688	0.12			Q	V	
4+47	0.0690	0.12			Q	V	
4+48	0.0691	0.11	Q			V	
4+49	0.0693	0.11	Q			V	
4+50	0.0694	0.11	Q			V	
4+51	0.0696	0.11	Q			V	
4+52	0.0697	0.11	Q			V	
4+53	0.0699	0.11	Q			V	
4+54	0.0700	0.10	Q			V	
4+55	0.0702	0.10	Q			V	
4+56	0.0703	0.10	Q			V	
4+57	0.0704	0.10	Q			V	
4+58	0.0706	0.10	Q			V	
4+59	0.0707	0.10	Q			V	
5+ 0	0.0709	0.10	Q			V	
5+ 1	0.0710	0.09	Q			V	
5+ 2	0.0711	0.09	Q			V	
5+ 3	0.0712	0.09	Q			V	
5+ 4	0.0714	0.09	Q			V	
5+ 5	0.0715	0.09	Q			V	
5+ 6	0.0716	0.09	Q			V	
5+ 7	0.0717	0.09	Q			V	
5+ 8	0.0719	0.09	Q			V	
5+ 9	0.0720	0.09	Q			V	
5+10	0.0721	0.09	Q			V	
5+11	0.0722	0.08	Q			V	
5+12	0.0723	0.08	Q			V	

PR4ASOUTH HYD

5+13	0.0724	0.08	Q				V
5+14	0.0726	0.08	Q				V
5+15	0.0727	0.08	Q				V
5+16	0.0728	0.08	Q				V
5+17	0.0729	0.08	Q				V
5+18	0.0730	0.08	Q				V
5+19	0.0731	0.08	Q				V
5+20	0.0732	0.08	Q				V
5+21	0.0733	0.08	Q				V
5+22	0.0734	0.08	Q				V
5+23	0.0735	0.08	Q				V
5+24	0.0736	0.08	Q				V
5+25	0.0737	0.07	Q				V
5+26	0.0738	0.07	Q				V
5+27	0.0739	0.07	Q				V
5+28	0.0740	0.07	Q				V
5+29	0.0741	0.07	Q				V
5+30	0.0742	0.07	Q				V
5+31	0.0743	0.07	Q				V
5+32	0.0744	0.07	Q				V
5+33	0.0745	0.07	Q				V
5+34	0.0746	0.07	Q				V
5+35	0.0747	0.07	Q				V
5+36	0.0748	0.07	Q				V
5+37	0.0749	0.07	Q				V
5+38	0.0750	0.07	Q				V
5+39	0.0751	0.07	Q				V
5+40	0.0752	0.07	Q				V
5+41	0.0753	0.07	Q				V
5+42	0.0754	0.07	Q				V
5+43	0.0754	0.06	Q				V
5+44	0.0755	0.06	Q				V
5+45	0.0756	0.06	Q				V
5+46	0.0757	0.06	Q				V
5+47	0.0758	0.06	Q				V
5+48	0.0759	0.06	Q				V
5+49	0.0760	0.06	Q				V
5+50	0.0761	0.06	Q				V
5+51	0.0761	0.06	Q				V
5+52	0.0762	0.06	Q				V
5+53	0.0763	0.06	Q				V
5+54	0.0764	0.06	Q				V
5+55	0.0765	0.06	Q				V
5+56	0.0766	0.06	Q				V
5+57	0.0766	0.06	Q				V
5+58	0.0767	0.06	Q				V
5+59	0.0768	0.06	Q				V
6+ 0	0.0769	0.06	Q				V
6+ 1	0.0770	0.06	Q				V
6+ 2	0.0770	0.06	Q				V
6+ 3	0.0771	0.06	Q				V
6+ 4	0.0772	0.06	Q				V
6+ 5	0.0773	0.06	Q				V
6+ 6	0.0774	0.06	Q				V
6+ 7	0.0774	0.06	Q				V
6+ 8	0.0775	0.06	Q				V
6+ 9	0.0776	0.06	Q				V
6+10	0.0777	0.06	Q				V

PR4ASOUTHHD
End of computations, total study area = 0.684 (Ac.)

PR4ASOUTHDET

FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 05/01/17

Program License Serial Number 6313

***** HYDROGRAPH INFORMATION *****

From study/file name: PR4ASOUTHHYD.rte
*****HYDROGRAPH DATA*****
Number of intervals = 370
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 1.546 (CFS)
Total volume = 0.078 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

+++++
Process from Point/Station 202.000 to Point/Station 203.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 370
Hydrograph time unit = 1.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:
Basin Depth Storage Outflow (S-0*dt/2) (S+0*dt/2)
(Ft.) (Ac.Ft) (CFS) (Ac.Ft) (Ac.Ft)

0.000 0.000 0.000 0.000 0.000
0.500 0.014 0.350 0.014 0.014
1.000 0.028 0.580 0.028 0.028

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	0	0.4	0.77	1.16	1.55	Depth (Ft.)

PR4ASOUTHDET									
0.017	0.01	0.00	0.000	0					0.00
0.033	0.01	0.00	0.000	0					0.00
0.050	0.02	0.00	0.000	0					0.00
0.067	0.02	0.00	0.000	0					0.00
0.083	0.03	0.00	0.000	0					0.00
0.100	0.03	0.00	0.000	0					0.00
0.117	0.04	0.00	0.000	0					0.01
0.133	0.04	0.01	0.000	0					0.01
0.150	0.05	0.01	0.000	OI					0.01
0.167	0.06	0.01	0.000	OI					0.01
0.183	0.06	0.01	0.000	OI					0.01
0.200	0.06	0.01	0.000	OI					0.02
0.217	0.06	0.01	0.001	OI					0.02
0.233	0.06	0.01	0.001	OI					0.02
0.250	0.06	0.02	0.001	OI					0.02
0.267	0.06	0.02	0.001	OI					0.03
0.283	0.06	0.02	0.001	OI					0.03
0.300	0.06	0.02	0.001	OI					0.03
0.317	0.06	0.02	0.001	OI					0.03
0.333	0.06	0.02	0.001	OI					0.03
0.350	0.06	0.02	0.001	OI					0.03
0.367	0.06	0.02	0.001	OI					0.04
0.383	0.06	0.03	0.001	OI					0.04
0.400	0.06	0.03	0.001	OI					0.04
0.417	0.06	0.03	0.001	OI					0.04
0.433	0.06	0.03	0.001	OI					0.04
0.450	0.06	0.03	0.001	OI					0.04
0.467	0.06	0.03	0.001	OI					0.04
0.483	0.06	0.03	0.001	OI					0.05
0.500	0.06	0.03	0.001	OI					0.05
0.517	0.06	0.03	0.001	OI					0.05
0.533	0.06	0.03	0.001	OI					0.05
0.550	0.06	0.04	0.001	OI					0.05
0.567	0.06	0.04	0.001	OI					0.05
0.583	0.06	0.04	0.001	OI					0.05
0.600	0.06	0.04	0.002	OI					0.05
0.617	0.06	0.04	0.002	OI					0.06
0.633	0.06	0.04	0.002	OI					0.06
0.650	0.06	0.04	0.002	OI					0.06
0.667	0.06	0.04	0.002	OI					0.06
0.683	0.06	0.04	0.002	OI					0.06
0.700	0.06	0.04	0.002	OI					0.06
0.717	0.06	0.04	0.002	OI					0.06
0.733	0.06	0.04	0.002	OI					0.06
0.750	0.06	0.04	0.002	OI					0.06
0.767	0.06	0.04	0.002	OI					0.06
0.783	0.06	0.05	0.002	OI					0.06
0.800	0.06	0.05	0.002	OI					0.07
0.817	0.06	0.05	0.002	OI					0.07
0.833	0.06	0.05	0.002	OI					0.07
0.850	0.06	0.05	0.002	OI					0.07
0.867	0.06	0.05	0.002	OI					0.07
0.883	0.06	0.05	0.002	0					0.07
0.900	0.06	0.05	0.002	0					0.07
0.917	0.06	0.05	0.002	0					0.07
0.933	0.06	0.05	0.002	0					0.07
0.950	0.06	0.05	0.002	0					0.07
0.967	0.06	0.05	0.002	0					0.07
0.983	0.06	0.05	0.002	0					0.07
1.000	0.06	0.05	0.002	0					0.07
1.017	0.07	0.05	0.002	0					0.07
1.033	0.07	0.05	0.002	0					0.08
1.050	0.07	0.05	0.002	0					0.08

PR4ASOUTHDET

1.067	0.07	0.05	0.002	0					0.08
1.083	0.07	0.05	0.002	0					0.08
1.100	0.07	0.05	0.002	0					0.08
1.117	0.07	0.05	0.002	0					0.08
1.133	0.07	0.06	0.002	0					0.08
1.150	0.07	0.06	0.002	0					0.08
1.167	0.07	0.06	0.002	0					0.08
1.183	0.07	0.06	0.002	0					0.08
1.200	0.07	0.06	0.002	0					0.08
1.217	0.07	0.06	0.002	0					0.08
1.233	0.07	0.06	0.002	0					0.08
1.250	0.07	0.06	0.002	0					0.08
1.267	0.07	0.06	0.002	0					0.08
1.283	0.07	0.06	0.002	0					0.08
1.300	0.07	0.06	0.002	0					0.08
1.317	0.07	0.06	0.002	0					0.08
1.333	0.07	0.06	0.002	0					0.09
1.350	0.07	0.06	0.002	0					0.09
1.367	0.07	0.06	0.002	0					0.09
1.383	0.07	0.06	0.002	0					0.09
1.400	0.07	0.06	0.002	0					0.09
1.417	0.07	0.06	0.002	0					0.09
1.433	0.07	0.06	0.002	0					0.09
1.450	0.07	0.06	0.002	0					0.09
1.467	0.07	0.06	0.003	0					0.09
1.483	0.07	0.06	0.003	0					0.09
1.500	0.07	0.06	0.003	0					0.09
1.517	0.07	0.06	0.003	0					0.09
1.533	0.07	0.06	0.003	0					0.09
1.550	0.07	0.06	0.003	0					0.09
1.567	0.07	0.06	0.003	0					0.09
1.583	0.07	0.06	0.003	0					0.09
1.600	0.07	0.07	0.003	0					0.09
1.617	0.07	0.07	0.003	0					0.09
1.633	0.07	0.07	0.003	0					0.09
1.650	0.08	0.07	0.003	0					0.09
1.667	0.08	0.07	0.003	0					0.09
1.683	0.08	0.07	0.003	0					0.10
1.700	0.08	0.07	0.003	0					0.10
1.717	0.08	0.07	0.003	0					0.10
1.733	0.08	0.07	0.003	0					0.10
1.750	0.08	0.07	0.003	0					0.10
1.767	0.08	0.07	0.003	0					0.10
1.783	0.08	0.07	0.003	0					0.10
1.800	0.08	0.07	0.003	0					0.10
1.817	0.08	0.07	0.003	0					0.10
1.833	0.08	0.07	0.003	0					0.10
1.850	0.08	0.07	0.003	0					0.10
1.867	0.08	0.07	0.003	0					0.10
1.883	0.08	0.07	0.003	0					0.10
1.900	0.08	0.07	0.003	0					0.10
1.917	0.08	0.07	0.003	0					0.10
1.933	0.08	0.07	0.003	0					0.10
1.950	0.08	0.07	0.003	0					0.10
1.967	0.08	0.07	0.003	0					0.10
1.983	0.08	0.07	0.003	0					0.10
2.000	0.08	0.07	0.003	0					0.10
2.017	0.08	0.07	0.003	0					0.10
2.033	0.08	0.07	0.003	0					0.11
2.050	0.08	0.07	0.003	0					0.11
2.067	0.09	0.07	0.003	0					0.11
2.083	0.09	0.07	0.003	0					0.11
2.100	0.09	0.08	0.003	0					0.11

PR4ASOUTHDET

2.117	0.09	0.08	0.003	0				0.11
2.133	0.09	0.08	0.003	0				0.11
2.150	0.09	0.08	0.003	0				0.11
2.167	0.09	0.08	0.003	0				0.11
2.183	0.09	0.08	0.003	0				0.11
2.200	0.09	0.08	0.003	0				0.11
2.217	0.09	0.08	0.003	0				0.11
2.233	0.09	0.08	0.003	0				0.11
2.250	0.09	0.08	0.003	0				0.11
2.267	0.09	0.08	0.003	0				0.11
2.283	0.09	0.08	0.003	0				0.11
2.300	0.09	0.08	0.003	0				0.11
2.317	0.09	0.08	0.003	0				0.11
2.333	0.09	0.08	0.003	0				0.12
2.350	0.09	0.08	0.003	0				0.12
2.367	0.09	0.08	0.003	0				0.12
2.383	0.09	0.08	0.003	0				0.12
2.400	0.10	0.08	0.003	0				0.12
2.417	0.10	0.08	0.003	0				0.12
2.433	0.10	0.08	0.003	OI				0.12
2.450	0.10	0.08	0.003	OI				0.12
2.467	0.10	0.08	0.003	OI				0.12
2.483	0.10	0.08	0.003	OI				0.12
2.500	0.10	0.09	0.003	OI				0.12
2.517	0.10	0.09	0.003	OI				0.12
2.533	0.10	0.09	0.003	OI				0.12
2.550	0.10	0.09	0.003	OI				0.12
2.567	0.10	0.09	0.003	OI				0.12
2.583	0.10	0.09	0.004	OI				0.13
2.600	0.10	0.09	0.004	OI				0.13
2.617	0.10	0.09	0.004	OI				0.13
2.633	0.10	0.09	0.004	OI				0.13
2.650	0.10	0.09	0.004	OI				0.13
2.667	0.10	0.09	0.004	OI				0.13
2.683	0.11	0.09	0.004	OI				0.13
2.700	0.11	0.09	0.004	OI				0.13
2.717	0.11	0.09	0.004	OI				0.13
2.733	0.11	0.09	0.004	OI				0.13
2.750	0.11	0.09	0.004	OI				0.13
2.767	0.11	0.09	0.004	OI				0.13
2.783	0.11	0.09	0.004	OI				0.13
2.800	0.11	0.09	0.004	OI				0.14
2.817	0.12	0.10	0.004	OI				0.14
2.833	0.12	0.10	0.004	OI				0.14
2.850	0.12	0.10	0.004	0				0.14
2.867	0.12	0.10	0.004	0				0.14
2.883	0.12	0.10	0.004	0				0.14
2.900	0.12	0.10	0.004	0				0.14
2.917	0.12	0.10	0.004	0				0.14
2.933	0.12	0.10	0.004	0				0.14
2.950	0.12	0.10	0.004	0				0.14
2.967	0.12	0.10	0.004	0				0.15
2.983	0.12	0.10	0.004	0				0.15
3.000	0.12	0.10	0.004	0				0.15
3.017	0.13	0.10	0.004	0				0.15
3.033	0.13	0.10	0.004	0				0.15
3.050	0.13	0.11	0.004	0				0.15
3.067	0.13	0.11	0.004	0				0.15
3.083	0.13	0.11	0.004	0				0.15
3.100	0.13	0.11	0.004	0				0.15
3.117	0.14	0.11	0.004	0				0.16
3.133	0.14	0.11	0.004	0				0.16
3.150	0.14	0.11	0.004	0				0.16

PR4ASOUTHDET

3.167	0.14	0.11	0.004	0							0.16
3.183	0.14	0.11	0.005	0							0.16
3.200	0.14	0.11	0.005	0							0.16
3.217	0.14	0.11	0.005	0							0.16
3.233	0.15	0.12	0.005	OI							0.17
3.250	0.15	0.12	0.005	OI							0.17
3.267	0.15	0.12	0.005	OI							0.17
3.283	0.15	0.12	0.005	OI							0.17
3.300	0.15	0.12	0.005	OI							0.17
3.317	0.15	0.12	0.005	OI							0.17
3.333	0.15	0.12	0.005	OI							0.17
3.350	0.16	0.12	0.005	OI							0.18
3.367	0.16	0.12	0.005	OI							0.18
3.383	0.16	0.13	0.005	OI							0.18
3.400	0.17	0.13	0.005	OI							0.18
3.417	0.17	0.13	0.005	OI							0.18
3.433	0.17	0.13	0.005	OI							0.19
3.450	0.18	0.13	0.005	OI							0.19
3.467	0.18	0.13	0.005	OI							0.19
3.483	0.18	0.13	0.005	OI							0.19
3.500	0.19	0.14	0.005	OI							0.19
3.517	0.19	0.14	0.006	OI							0.20
3.533	0.19	0.14	0.006	OI							0.20
3.550	0.20	0.14	0.006	O I							0.20
3.567	0.20	0.14	0.006	O I							0.21
3.583	0.20	0.15	0.006	OI							0.21
3.600	0.20	0.15	0.006	OI							0.21
3.617	0.21	0.15	0.006	OI							0.21
3.633	0.21	0.15	0.006	OI							0.22
3.650	0.21	0.15	0.006	OI							0.22
3.667	0.21	0.16	0.006	OI							0.22
3.683	0.22	0.16	0.006	OI							0.22
3.700	0.23	0.16	0.006	OI							0.23
3.717	0.24	0.16	0.006	O I							0.23
3.733	0.25	0.17	0.007	O I							0.24
3.750	0.26	0.17	0.007	O I							0.24
3.767	0.27	0.17	0.007	O I							0.25
3.783	0.28	0.18	0.007	O I							0.25
3.800	0.29	0.18	0.007	O I							0.26
3.817	0.30	0.18	0.007	O I							0.26
3.833	0.31	0.19	0.008	O I							0.27
3.850	0.33	0.19	0.008	O I							0.27
3.867	0.34	0.20	0.008	O I							0.28
3.883	0.35	0.20	0.008	O I							0.29
3.900	0.36	0.21	0.008	O I							0.30
3.917	0.38	0.21	0.009	O I							0.30
3.933	0.39	0.22	0.009	O I							0.31
3.950	0.40	0.22	0.009	O I							0.32
3.967	0.42	0.23	0.009	O I							0.33
3.983	0.43	0.24	0.009	O I							0.34
4.000	0.44	0.24	0.010	O I							0.35
4.017	0.55	0.25	0.010	O I							0.36
4.033	0.66	0.26	0.011	O I							0.38
4.050	0.77	0.28	0.011	O I							0.40
4.067	0.88	0.30	0.012	O I							0.43
4.083	0.99	0.32	0.013	O I							0.46
4.100	1.10	0.34	0.014	O I							0.49
4.117	1.21	0.36	0.015	O I							0.53
4.133	1.33	0.38	0.016	O I							0.58
4.150	1.44	0.41	0.017	O I							0.62
4.167	1.55	0.43	0.019	O I							0.68
4.183	1.42	0.45	0.020	O I							0.73
4.200	1.29	0.48	0.022	O I							0.77

				PR4ASOUTHDET							
4.217	1.16	0.49	0.023			0				I	0.81
4.233	1.03	0.51	0.023			0				I	0.84
4.250	0.90	0.52	0.024			0			I		0.86
4.267	0.77	0.52	0.025			0		I			0.88
4.283	0.64	0.53	0.025			0	I				0.88
4.300	0.51	0.53	0.025			0					0.89
4.317	0.38	0.53	0.025		I	0					0.88
4.333	0.25	0.52	0.024		I	0					0.87
4.350	0.24	0.52	0.024		I	0					0.86
4.367	0.23	0.51	0.024		I	0					0.85
4.383	0.23	0.50	0.023		I	0					0.83
4.400	0.22	0.50	0.023		I	0					0.82
4.417	0.21	0.49	0.023		I	0					0.80
4.433	0.20	0.48	0.022		I	0					0.79
4.450	0.19	0.48	0.022		I	0					0.78
4.467	0.18	0.47	0.021		I	0					0.76
4.483	0.18	0.46	0.021		I	0					0.75
4.500	0.17	0.46	0.021		I	0					0.73
4.517	0.16	0.45	0.020		I	0					0.72
4.533	0.16	0.44	0.020		I	0					0.71
4.550	0.16	0.44	0.019		I	0					0.69
4.567	0.15	0.43	0.019		I	0					0.68
4.583	0.15	0.43	0.019		I	0					0.66
4.600	0.15	0.42	0.018		I	0					0.65
4.617	0.14	0.41	0.018		I	0					0.64
4.633	0.14	0.41	0.017		I	0					0.62
4.650	0.14	0.40	0.017		I	0					0.61
4.667	0.13	0.40	0.017		I	0					0.60
4.683	0.13	0.39	0.016		I	0					0.59
4.700	0.13	0.38	0.016		I	0					0.57
4.717	0.13	0.38	0.016		I	0					0.56
4.733	0.12	0.37	0.015		I	0					0.55
4.750	0.12	0.37	0.015		I	0					0.54
4.767	0.12	0.36	0.015		I	0					0.52
4.783	0.12	0.36	0.014		I	0					0.51
4.800	0.11	0.35	0.014		I	0					0.50
4.817	0.11	0.34	0.014		I	0					0.49
4.833	0.11	0.33	0.013		I	0					0.48
4.850	0.11	0.33	0.013		I	0					0.47
4.867	0.11	0.32	0.013		I	0					0.46
4.883	0.11	0.31	0.012		I	0					0.45
4.900	0.10	0.31	0.012		I	0					0.44
4.917	0.10	0.30	0.012		I	0					0.43
4.933	0.10	0.29	0.012		I	0					0.42
4.950	0.10	0.29	0.011		I	0					0.41
4.967	0.10	0.28	0.011		I	0					0.40
4.983	0.10	0.27	0.011		I	0					0.39
5.000	0.10	0.27	0.011		I	0					0.38
5.017	0.09	0.26	0.010		I	0					0.37
5.033	0.09	0.26	0.010		I	0					0.36
5.050	0.09	0.25	0.010		I	0					0.36
5.067	0.09	0.24	0.010		I	0					0.35
5.083	0.09	0.24	0.010		I	0					0.34
5.100	0.09	0.23	0.009		I	0					0.33
5.117	0.09	0.23	0.009		I	0					0.33
5.133	0.09	0.22	0.009		I	0					0.32
5.150	0.09	0.22	0.009		I	0					0.31
5.167	0.09	0.22	0.009		I	0					0.31
5.183	0.08	0.21	0.008		I	0					0.30
5.200	0.08	0.21	0.008		I	0					0.30
5.217	0.08	0.20	0.008		I	0					0.29
5.233	0.08	0.20	0.008		I	0					0.28
5.250	0.08	0.19	0.008		I	0					0.28

PR4ASOUTHDET

5.267	0.08	0.19	0.008	I 0					0.27
5.283	0.08	0.19	0.007	I 0					0.27
5.300	0.08	0.18	0.007	I 0					0.26
5.317	0.08	0.18	0.007	I 0					0.26
5.333	0.08	0.18	0.007	I 0					0.25
5.350	0.08	0.17	0.007	I 0					0.25
5.367	0.08	0.17	0.007	I 0					0.24
5.383	0.08	0.17	0.007	I 0					0.24
5.400	0.08	0.16	0.007	I 0					0.23
5.417	0.07	0.16	0.006	I 0					0.23
5.433	0.07	0.16	0.006	I 0					0.23
5.450	0.07	0.15	0.006	I 0					0.22
5.467	0.07	0.15	0.006	I 0					0.22
5.483	0.07	0.15	0.006	I 0					0.21
5.500	0.07	0.15	0.006	I 0					0.21
5.517	0.07	0.14	0.006	IO					0.21
5.533	0.07	0.14	0.006	IO					0.20
5.550	0.07	0.14	0.006	IO					0.20
5.567	0.07	0.14	0.005	IO					0.20
5.583	0.07	0.13	0.005	IO					0.19
5.600	0.07	0.13	0.005	IO					0.19
5.617	0.07	0.13	0.005	IO					0.19
5.633	0.07	0.13	0.005	IO					0.18
5.650	0.07	0.13	0.005	IO					0.18
5.667	0.07	0.12	0.005	IO					0.18
5.683	0.07	0.12	0.005	IO					0.17
5.700	0.07	0.12	0.005	IO					0.17
5.717	0.06	0.12	0.005	IO					0.17
5.733	0.06	0.12	0.005	IO					0.17
5.750	0.06	0.11	0.005	IO					0.16
5.767	0.06	0.11	0.005	IO					0.16
5.783	0.06	0.11	0.004	IO					0.16
5.800	0.06	0.11	0.004	IO					0.16
5.817	0.06	0.11	0.004	IO					0.15
5.833	0.06	0.11	0.004	IO					0.15
5.850	0.06	0.10	0.004	IO					0.15
5.867	0.06	0.10	0.004	IO					0.15
5.883	0.06	0.10	0.004	IO					0.15
5.900	0.06	0.10	0.004	IO					0.14
5.917	0.06	0.10	0.004	IO					0.14
5.933	0.06	0.10	0.004	IO					0.14
5.950	0.06	0.10	0.004	O					0.14
5.967	0.06	0.10	0.004	O					0.14
5.983	0.06	0.09	0.004	O					0.13
6.000	0.06	0.09	0.004	O					0.13
6.017	0.06	0.09	0.004	O					0.13
6.033	0.06	0.09	0.004	O					0.13
6.050	0.06	0.09	0.004	O					0.13
6.067	0.06	0.09	0.004	O					0.13
6.083	0.06	0.09	0.003	O					0.12
6.100	0.06	0.09	0.003	O					0.12
6.117	0.06	0.09	0.003	O					0.12
6.133	0.06	0.08	0.003	O					0.12
6.150	0.06	0.08	0.003	O					0.12
6.167	0.06	0.08	0.003	O					0.12
6.183	0.00	0.08	0.003	IO					0.11
6.200	0.00	0.08	0.003	IO					0.11
6.217	0.00	0.08	0.003	IO					0.11
6.233	0.00	0.07	0.003	IO					0.10
6.250	0.00	0.07	0.003	IO					0.10
6.267	0.00	0.07	0.003	IO					0.10
6.283	0.00	0.07	0.003	IO					0.09
6.300	0.00	0.06	0.003	IO					0.09

PR4ASOUTHDET									
6.317	0.00	0.06	0.002	IO					0.09
6.333	0.00	0.06	0.002	IO					0.08
6.350	0.00	0.06	0.002	IO					0.08
6.367	0.00	0.06	0.002	IO					0.08
6.383	0.00	0.05	0.002	IO					0.08
6.400	0.00	0.05	0.002	IO					0.07
6.417	0.00	0.05	0.002	IO					0.07
6.433	0.00	0.05	0.002	0					0.07
6.450	0.00	0.05	0.002	0					0.07
6.467	0.00	0.04	0.002	0					0.06
6.483	0.00	0.04	0.002	0					0.06
6.500	0.00	0.04	0.002	0					0.06
6.517	0.00	0.04	0.002	0					0.06
6.533	0.00	0.04	0.002	0					0.06
6.550	0.00	0.04	0.002	0					0.05
6.567	0.00	0.04	0.001	0					0.05
6.583	0.00	0.04	0.001	0					0.05
6.600	0.00	0.03	0.001	0					0.05
6.617	0.00	0.03	0.001	0					0.05
6.633	0.00	0.03	0.001	0					0.05
6.650	0.00	0.03	0.001	0					0.04
6.667	0.00	0.03	0.001	0					0.04
6.683	0.00	0.03	0.001	0					0.04
6.700	0.00	0.03	0.001	0					0.04
6.717	0.00	0.03	0.001	0					0.04
6.733	0.00	0.03	0.001	0					0.04
6.750	0.00	0.02	0.001	0					0.04
6.767	0.00	0.02	0.001	0					0.03
6.783	0.00	0.02	0.001	0					0.03
6.800	0.00	0.02	0.001	0					0.03
6.817	0.00	0.02	0.001	0					0.03
6.833	0.00	0.02	0.001	0					0.03
6.850	0.00	0.02	0.001	0					0.03
6.867	0.00	0.02	0.001	0					0.03
6.883	0.00	0.02	0.001	0					0.03
6.900	0.00	0.02	0.001	0					0.03
6.917	0.00	0.02	0.001	0					0.03
6.933	0.00	0.02	0.001	0					0.02
6.950	0.00	0.02	0.001	0					0.02
6.967	0.00	0.02	0.001	0					0.02
6.983	0.00	0.02	0.001	0					0.02
7.000	0.00	0.01	0.001	0					0.02
7.017	0.00	0.01	0.001	0					0.02
7.033	0.00	0.01	0.001	0					0.02
7.050	0.00	0.01	0.001	0					0.02
7.067	0.00	0.01	0.001	0					0.02
7.083	0.00	0.01	0.001	0					0.02
7.100	0.00	0.01	0.000	0					0.02
7.117	0.00	0.01	0.000	0					0.02
7.133	0.00	0.01	0.000	0					0.02
7.150	0.00	0.01	0.000	0					0.02
7.167	0.00	0.01	0.000	0					0.02
7.183	0.00	0.01	0.000	0					0.01
7.200	0.00	0.01	0.000	0					0.01
7.217	0.00	0.01	0.000	0					0.01
7.233	0.00	0.01	0.000	0					0.01
7.250	0.00	0.01	0.000	0					0.01
7.267	0.00	0.01	0.000	0					0.01
7.283	0.00	0.01	0.000	0					0.01
7.300	0.00	0.01	0.000	0					0.01
7.317	0.00	0.01	0.000	0					0.01
7.333	0.00	0.01	0.000	0					0.01
7.350	0.00	0.01	0.000	0					0.01

PR4ASOUTHDET					
7.367	0.00	0.01	0.000	0	0.01
7.383	0.00	0.01	0.000	0	0.01
7.400	0.00	0.01	0.000	0	0.01
7.417	0.00	0.01	0.000	0	0.01
7.433	0.00	0.01	0.000	0	0.01
7.450	0.00	0.01	0.000	0	0.01
7.467	0.00	0.01	0.000	0	0.01
7.483	0.00	0.01	0.000	0	0.01
7.500	0.00	0.01	0.000	0	0.01
7.517	0.00	0.01	0.000	0	0.01
7.533	0.00	0.00	0.000	0	0.01
7.550	0.00	0.00	0.000	0	0.01
7.567	0.00	0.00	0.000	0	0.01
7.583	0.00	0.00	0.000	0	0.01
7.600	0.00	0.00	0.000	0	0.01
7.617	0.00	0.00	0.000	0	0.01
7.633	0.00	0.00	0.000	0	0.01
7.650	0.00	0.00	0.000	0	0.01
7.667	0.00	0.00	0.000	0	0.01
7.683	0.00	0.00	0.000	0	0.01
7.700	0.00	0.00	0.000	0	0.01
7.717	0.00	0.00	0.000	0	0.00
7.733	0.00	0.00	0.000	0	0.00
7.750	0.00	0.00	0.000	0	0.00
7.767	0.00	0.00	0.000	0	0.00
7.783	0.00	0.00	0.000	0	0.00
7.800	0.00	0.00	0.000	0	0.00
7.817	0.00	0.00	0.000	0	0.00
7.833	0.00	0.00	0.000	0	0.00
7.850	0.00	0.00	0.000	0	0.00
7.867	0.00	0.00	0.000	0	0.00
7.883	0.00	0.00	0.000	0	0.00
7.900	0.00	0.00	0.000	0	0.00
7.917	0.00	0.00	0.000	0	0.00
7.933	0.00	0.00	0.000	0	0.00
7.950	0.00	0.00	0.000	0	0.00
7.967	0.00	0.00	0.000	0	0.00
7.983	0.00	0.00	0.000	0	0.00
8.000	0.00	0.00	0.000	0	0.00
8.017	0.00	0.00	0.000	0	0.00
8.033	0.00	0.00	0.000	0	0.00
8.050	0.00	0.00	0.000	0	0.00
8.067	0.00	0.00	0.000	0	0.00
8.083	0.00	0.00	0.000	0	0.00
8.100	0.00	0.00	0.000	0	0.00
8.117	0.00	0.00	0.000	0	0.00
8.133	0.00	0.00	0.000	0	0.00
8.150	0.00	0.00	0.000	0	0.00
8.167	0.00	0.00	0.000	0	0.00
8.183	0.00	0.00	0.000	0	0.00
8.200	0.00	0.00	0.000	0	0.00
8.217	0.00	0.00	0.000	0	0.00
8.233	0.00	0.00	0.000	0	0.00
8.250	0.00	0.00	0.000	0	0.00
8.267	0.00	0.00	0.000	0	0.00
8.283	0.00	0.00	0.000	0	0.00
8.300	0.00	0.00	0.000	0	0.00
8.317	0.00	0.00	0.000	0	0.00

*****HYDROGRAPH DATA*****

Number of intervals = 499
Time interval = 1.0 (Min.)
Maximum/Peak flow rate = 0.528 (CFS)

```

PR4ASOUTHDET
Total volume = 0.078 (Ac.Ft)
Status of hydrographs being held in storage
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
Peak (CFS) 0.000 0.000 0.000 0.000 0.000
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****

```

PR4BSOUTHRROUTE

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 10/13/17

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

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.800
24 hour precipitation(inches) = 4.700
P6/P24 = 59.6%
San Diego hydrology manual 'C' values used

+++++
Process from Point/Station 201.000 to Point/Station 202.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

User specified 'C' value of 0.490 given for subarea
Rainfall intensity (I) = 3.527(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 15.70 min. Rain intensity = 3.53(In/Hr)
Total area = 0.684(Ac.) Total runoff = 0.528(CFS)

+++++
Process from Point/Station 202.000 to Point/Station 203.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 351.500(Ft.)
Downstream point/station elevation = 350.000(Ft.)
Pipe length = 66.00(Ft.) Slope = 0.0227 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.528(CFS)
Given pipe size = 8.00(In.)
Calculated individual pipe flow = 0.528(CFS)
Normal flow depth in pipe = 2.95(In.)
Flow top width inside pipe = 7.72(In.)
Critical Depth = 4.09(In.)
Pipe flow velocity = 4.52(Ft/s)
Travel time through pipe = 0.24 min.
Time of concentration (TC) = 15.94 min.

+++++
Process from Point/Station 202.000 to Point/Station 203.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 0.684(Ac.)

PR4BSOUTHRROUTE
 Runoff from this stream = 0.528(CFS)
 Time of concentration = 15.94 min.
 Rainfall intensity = 3.492(In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 302.000 to Point/Station 203.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

 User specified 'C' value of 0.350 given for subarea
 Rainfall intensity (I) = 5.243(In/Hr) for a 100.0 year storm
 User specified values are as follows:
 TC = 8.49 min. Rain intensity = 5.24(In/Hr)
 Total area = 1.734(Ac.) Total runoff = 3.182(CFS)

+++++
 Process from Point/Station 302.000 to Point/Station 203.000
 **** CONFLUENCE OF MAIN STREAMS ****

 The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 1.734(Ac.)
 Runoff from this stream = 3.182(CFS)
 Time of concentration = 8.49 min.
 Rainfall intensity = 5.243(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	0.528	15.94	3.492
2	3.182	8.49	5.243
Qmax(1) =			
	1.000 *	1.000 *	0.528) +
	0.666 *	1.000 *	3.182) + = 2.647
Qmax(2) =			
	1.000 *	0.533 *	0.528) +
	1.000 *	1.000 *	3.182) + = 3.463

Total of 2 main streams to confluence:

Flow rates before confluence point:

0.528 3.182

Maximum flow rates at confluence using above data:

2.647 3.463

Area of streams before confluence:

0.684 1.734

Results of confluence:

Total flow rate = 3.463(CFS)

Time of concentration = 8.490 min.

Effective stream area after confluence = 2.418(Ac.)

+++++
 Process from Point/Station 203.000 to Point/Station 204.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

 Depth of flow = 0.199(Ft.), Average velocity = 3.500(Ft/s)
 ***** Irregular Channel Data *****

PR4BSOUTHRROUTE

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.60
2	15.00	0.00
3	30.00	0.60

Manning's 'N' friction factor = 0.035

Sub-Channel flow = 3.463(CFS)
' ' flow top width = 9.947(Ft.)
' ' velocity= 3.500(Ft/s)
' ' area = 0.989(Sq.Ft)
' ' Froude number = 1.956

Upstream point elevation = 350.000(Ft.)
Downstream point elevation = 328.000(Ft.)
Flow length = 149.000(Ft.)
Travel time = 0.71 min.
Time of concentration = 9.20 min.
Depth of flow = 0.199(Ft.)
Average velocity = 3.500(Ft/s)
Total irregular channel flow = 3.463(CFS)
Irregular channel normal depth above invert elev. = 0.199(Ft.)
Average velocity of channel(s) = 3.500(Ft/s)

++++++
Process from Point/Station 203.000 to Point/Station 204.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 2.418(Ac.)
Runoff from this stream = 3.463(CFS)
Time of concentration = 9.20 min.
Rainfall intensity = 4.979(In/Hr)
Program is now starting with Main Stream No. 2

++++++
Process from Point/Station 101.000 to Point/Station 204.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.350
Initial subarea total flow distance = 1255.000(Ft.)
Highest elevation = 438.000(Ft.)
Lowest elevation = 328.000(Ft.)
Elevation difference = 110.000(Ft.) Slope = 8.765 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.77 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 6.55 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^0.5]/(% slope^(1/3))
TC = [1.8*(1.1-0.350)*(100.000^0.5)]/(8.765^(1/3))= 6.55

PR4BSOUTHRROUTE

The initial area total distance of 1255.00 (Ft.) entered leaves a remaining distance of 1155.00 (Ft.)
 Using Figure 3-4, the travel time for this distance is 4.55 minutes for a distance of 1155.00 (Ft.) and a slope of 8.77 %
 with an elevation difference of 101.24(Ft.) from the end of the top area
 $Tt = [11.9 * \text{length}(\text{Mi})^3 / (\text{elevation change}(\text{Ft.}))]^{.385} * 60(\text{min/hr})$
 = 4.548 Minutes
 $Tt = [(11.9 * 0.2188^3) / (101.24)]^{.385} = 4.55$
 Total initial area $Ti = 6.55$ minutes from Figure 3-3 formula plus
 4.55 minutes from the Figure 3-4 formula = 11.10 minutes
 Rainfall intensity (I) = 4.412(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is $C = 0.350$
 Subarea runoff = 24.709(CFS)
 Total initial stream area = 16.002(Ac.)

 Process from Point/Station 101.000 to Point/Station 204.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 16.002(Ac.)
 Runoff from this stream = 24.709(CFS)
 Time of concentration = 11.10 min.
 Rainfall intensity = 4.412(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	3.463	9.20	4.979
2	24.709	11.10	4.412
Qmax(1) =			
	1.000 *	1.000 *	3.463) +
	1.000 *	0.829 *	24.709) + = 23.949
Qmax(2) =			
	0.886 *	1.000 *	3.463) +
	1.000 *	1.000 *	24.709) + = 27.778

Total of 2 main streams to confluence:

Flow rates before confluence point:

3.463 24.709

Maximum flow rates at confluence using above data:

23.949 27.778

Area of streams before confluence:

2.418 16.002

Results of confluence:

Total flow rate = 27.778(CFS)

Time of concentration = 11.096 min.

Effective stream area after confluence = 18.420(Ac.)

End of computations, total study area = 18.420 (Ac.)

ATTACHMENT 5

HYDROLOGY MAP - EXISTING CONDITIONS

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