APPENDIX E

Drainage Study

PRELIMINARY
DRAINAGE REPORT
THE TRAILS AT CARMEL MOUNTAIN RANCH

City of San Diego, CA
April 8, 2020
VTM PTS #652519

Prepared For:

NUWI – 2 CMR, LLC
2001 Wilshire Blvd, Suite 401
Santa Monica, California 90403
Phone: 925-708-3638

Prepared By:

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey

701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

PDC Job No. 4394.00



Prepared by: G. Anderson
Under the supervision of

Chelisa Pack, PE RCE 71026
Registration Expires 06/30/21

TABLE OF CONTENTS

1. INTRODUCTION 1

2. EXISTING AND PROPOSED DRAINAGE PATTERNS 2

2.1 Existing Drainage Patterns 3

2.2 Proposed Drainage Patterns and Storm Drain Improvements 4

3. HYDROLOGY CRITERIA, METHODOLOGY, AND RESULTS 4

3.1 Hydrology Criteria 4

3.2 Hydrology Methodology 5

3.3 Hydrology Results 7

4. CONCLUSION 8

FIGURES

Figure 1: Project Vicinity Map 2

TABLES

Table 1: Hydrology Criteria 5
Table 2: Summary of Hydrology Results 8

APPENDICES

1 Supporting Documentation (IDF Curve, Runoff Coefficients, FEMA Firmette)

2 Existing Conditions 100-year Rational Method Computer Output

3 Proposed Conditions 100-year Rational Method Computer Output

4 Backbone Study As-built Record Drawings

5 Detention Basin Routing Analysis

6 Exhibits

1. INTRODUCTION

This preliminary drainage report has been prepared in support of a Vesting Tentative Map Entitlement submittal for the Trails at Carmel Mountain Ranch Project (the Project), which is located in the City of San Diego, California. The purpose of this report is to determine the hydrologic impact, if any, to the existing storm drain facilities or natural drainage, and to provide peak 100-year discharge values for the project.

The drainage analysis presented herein reflects a Vesting Tentative Map level-of-effort, which includes peak 100-year storm event hydrologic analyses using preliminary grades. Hydraulic analyses for inlets, pipe sizes, inverts, and HGL's will be provided during final engineering. Therefore, the purpose of this report submittal is to acquire from the City of San Diego: 1) concept approval of the proposed storm drain layout, 2) approval of the methodology used in the evaluation of the project storm drain system hydrology, and 3) identification of critical path drainage issues that need to be addressed during final engineering.

The Trails at Carmel Mountain Ranch Project is a proposed residential community located in the City of San Diego. The site is approximately 164.5 acres in size and is located east of Interstate 15, west of Pomerado Road, and between Carmel Mountain Road and Ted Williams Parkway. The Property was formerly operated as a golf course and is currently owned by PACS Enterprises, LLC. The Proposed Project includes approximately 101.4 acres of open space (including natural open space, landscaped slopes, and parkland), and a total of approximately 1200 residential units. The vicinity map is shown in Figure 1.

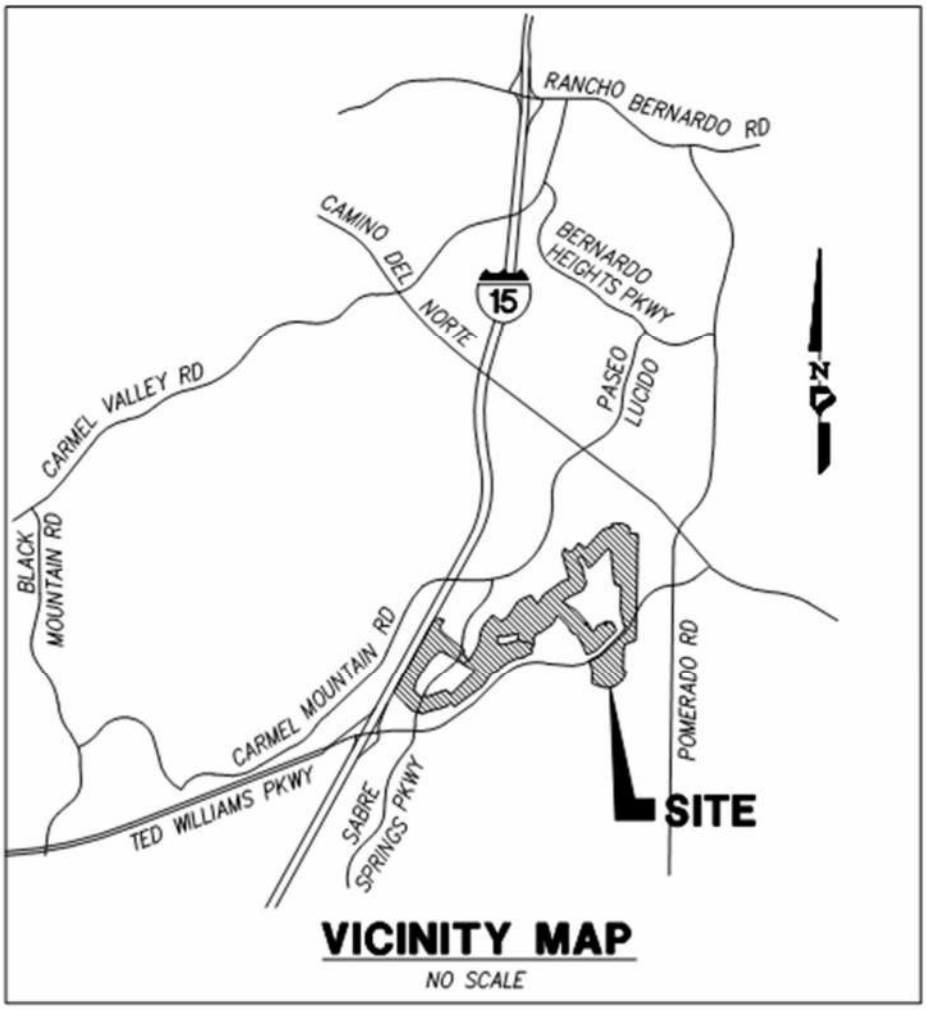


Figure 1: Project Vicinity Map

Redevelopment of the site will involve demolition of the existing golf course and regrading of the site to a usable condition compatible with future land uses. The project will not require a 401 Certification or an Army Corps of Engineers 404 permit. A blend of market rate homes, multi-family homes, and affordable housing is to be constructed including all associated landscaping, hardscaping, and utilities.

From a regional drainage perspective, the project's storm drain system will discharge into Los Penasquitos Creek. There is one FEMA special flood hazard area near the project site, see Appendix 1 for the full FEMA Firm.

Treatment of onsite storm water prior to discharging into the downstream systems will be facilitated by several biofiltration basins. For a detailed discussion of the project's stormwater quality BMPs and hydromodification management approach, refer to the Preliminary Stormwater Quality Management Plan (SWQMP) report. For the Southern California Coastal Water Research Project (SCCWRP) channel screening report for the project, refer to the SCCWRP report prepared by Chang Consultants and submitted under a separate cover. The SCCWRP report documents the channel erosivity analysis, which was used to document the low flow threshold to be used for design of the proposed hydromodification management facilities. The final post-construction BMP design will be provided during final engineering.

2. EXISTING AND PROPOSED DRAINAGE PATTERNS

2.1 Existing Drainage Patterns

The existing site is currently the location of the Carmel Mountain Ranch Golf Course and clubhouse. Generally the site drains to two different locations; the western half of the site drains west and is conveyed to outfalls in Chicarita Creek, and the eastern half of the site drains east and is conveyed to an outfall near Ted Williams Parkway on existing golf course hole 14. This water is then conveyed through natural canyons near Poway Fire Station 3 until it drains into Los Penasquitos Creek. Los Penasquitos Creek runs from east to west, and the runoff from Chicarita Creek eventually commingles with Los Penasquitos Creek at Cypress Canyon.

Because the majority of the area surrounding the project site is already developed, there is minimal run-on into the project site.

There are several existing private storm drain systems within the project site and two major public systems in the adjacent streets: a 72-inch CIP concrete storm drain per Drawing 22088-12-D on Shoal Creek Drive and a 72-inch RCP storm drain per Drawing 22745-23-D on Carmel Ridge Road. There are two additional storm drain system outlets near the project. A 48" RCP outlets into Chicarita Creek near Rancho Carmel Drive and a 54" RCP outlets into existing golf course hole 12 near Ted Williams Parkway.

Onsite, under existing conditions, the drainage from most holes generally sheetflows into a type F catch basin at the downhill side of the hole. A private storm drain attached to the type F CB then conveys water to one of the public storm drain systems listed above.

See Exhibit A in Appendix 6 for an existing conditions drainage map. Note that for some of the systems, the downstream limits of the onsite drainage areas were set to approximate the downstream limits of the proposed drainage areas, in order to compare similar areas in pre-project and post-project flows.

2.2 Proposed Drainage Patterns and Storm Drain Improvements

Redevelopment will disturb approximately 74 acres of the project site. Proposed development will not significantly alter ultimate discharge points of onsite and offsite runoff. There is minimal offsite runon onto the project site, and proposed onsite drainage patterns will mimic existing drainage patterns. Some local re-direction of runoff occurs onsite, however most flows converge in the storm drain systems that head to Chicarita Creek or Los Penasquitos Creek.

The west side of the project site (existing course holes 1, 2, 5, 6, 8, and 9) will continue to discharge to Chicarita Creek through either a 48" or 72" RCP. The east side of the site (existing holes 10, 11, 16, 17, and 18) will drain through a 72" RCP into natural canyons before converging with Los Penasquitos Creek. The proposed drainage improvements include private storm drains collecting rooftop and surface drainage and public storm drains in public roads that connect private pipes with the public storm drain system. Refer to Exhibit B in Appendix 6 for the proposed condition drainage map.

3. HYDROLOGY CRITERIA, METHODOLOGY, AND RESULTS

3.1 Hydrology Criteria

Table 1 summarizes the key hydrology assumptions and criteria used for the hydrologic modeling.

Table 1: Hydrology Criteria

Existing and Proposed Hydrology:	100-year storm frequency
Soil Type:	Hydrologic Soil Group D per Drainage Design Manual requirements
Runoff coefficients:	Based on land use in sub-drainage area, from C=0.45 to 0.95. See Rational Method output.
Rainfall intensity:	Based on the City of San Diego Intensity Frequency Duration Curves presented in the 2017 City of San Diego Drainage Design Manual.

3.2 Hydrology Methodology

Hydrology calculations were completed for existing and proposed conditions accounting for all areas draining to the onsite storm drain systems. Drainage areas were defined from existing and proposed topographic maps of the area. A hydrologic analysis was completed utilizing the Rational Method, outlined in the 2017 City of San Diego Drainage Design Manual. The goal of the Rational Method analysis was to determine the peak 100-year flow rates for the storm drain pipes by developing a node link model of the contributing drainage area and applying the intensity-duration-frequency (IDF) curve to the areas. See Appendix 1 for the City of San Diego IDF curve.

The Civil-D computer program was used to obtain peak flow rates for the offsite and onsite drainage areas under existing and proposed conditions. The Civil-D Modified Rational Method Hydrology Program is a computer-aided design program where the user develops a node link model of the watershed. Developing independent node link models for each interior watershed and linking these sub-models together at confluence points creates the node link model. The intensity-duration-frequency relationships are applied to each of the drainage areas in the model to get the peak flow rates at each point of interest.

The project drainage areas were split into multiple systems representing different outfall areas of concern. Generally, each existing course hole is a separate system. For the proposed condition, Systems 1000 and 2000 represent existing course holes 1 and 2, respectively. System 1000 drains to BMP 1, which is conveyed offsite by an 18" RCP per Drawing 22838-5-D, while System 2000

drains to BMP 2, which is conveyed offsite by an 18" RCP per Drawing 22088-3-D. System 5000 represents the area on existing hole 5 to the east of Chicarita Creek and outside of the environmental buffer. This area drains to BMP 5 and is conveyed offsite via a 48" RCP per Drawing 22917-5-D. System 6000 represents existing hole 6 and some run-on area from existing hole 7. This system drains to BMP 6 and is conveyed offsite via a 36" RCP per Drawing 22917-5-D. Both Systems 5000 and 6000 are conveyed to the Chicarita Creek point of compliance "A" (POC A) via the 48" RCP. System 8000 consists of the area that is existing condition course hole 8 and some hillside run-on. This area drains to BMP 8 and is conveyed offsite by a 48" RCP via Drawing 22939-3-D. System 9000 consists of a portion of existing hole 9 and the existing clubhouse parking lot. This system drains to BMP 9. System 9500 consists of the detained flow from BMP 9 and hillside bypass area from the remaining portion of existing hole 9. Systems 1000, 2000, 8000, and 9000 are all conveyed to the Chicarita Creek POC B within a 72" RCP via Drawing 22088-3-D.

System 11000 consists of existing course holes 10 and 11. This area drains to BMP 11 and is conveyed offsite by an 18" RCP pipe per Drawing 24565-2-D. The detained flow from BMP 11 is conveyed to the open space area POC E on existing hole 12. System 16000 consists of the existing course hole 16. This area drains to BMP 16 and is conveyed offsite and to the open space area POC C by a 72" RCP via Drawing 22745-21-D. System 17000 consists of the existing hole 17 and drains to BMP 17. System 18 consists of existing course hole 18 and the existing course clubhouse. This area drains to BMP 18. System 18500 consists of the detained flow from BMPs 17 and 18, and hillside bypass area on existing hole 18. This system is conveyed offsite by an 18" RCP via Drawing 26514-11-D. It eventually heads to natural canyon POC D. Flow from the 72" RCP at POC C is also conveyed through open space area to POC D.

Four systems are being planned as potential public city parks, and are pending City approval before a site plan is created. Because of this, a Civil D model for existing and proposed conditions for each system has been created based on the preliminary park footprints and assuming a proposed runoff coefficient of 0.45. Because the parks do not yet have site plans, the imperviousness of each park is currently unknown. Therefore, it is assumed that the stormwater quality approach for each park will be deferred until site plans are developed. The parks are anticipated to be almost exclusively pervious, with very little impervious area. There, this submittal includes no BMPs or

subsequent BMP calculations for water quality and hydromodification for these systems. System 7000 consists of existing course hole 7. This area drains to Chicarita Creek via POC B. System 13000 consists of a small portion of existing course hole 13, and flows to POC F. Systems 15000 (existing course hole 15) and 17500 (a portion of existing course hole 17) both drain to POC C which outlets into natural canyons on the east side of the site. Basin and/or BMP design for these systems will accompany a future submittal once each system land use is determined. However, as with all systems, flows for proposed conditions will be less than or equal to existing condition flows.

For comparison purposes, existing condition drainage systems are named similarly to the post-project drainage systems. For example, System 800 for existing conditions corresponds to System 8000 for proposed conditions. City of San Diego Drainage Design Manual runoff coefficients, based on land use, were assigned for each drainage sub-basin within CivilD. Additionally, site plans are still in development and therefore proposed conditions "C" values are estimated based on proposed land uses.

3.3 Hydrology Results

The results of the Rational Method hydrology modeling are provided in Appendices 2 and 3 and the results are summarized in this section. Redevelopment of the project site increased the 100-year runoff from the site, but peak flows after detention are less than either backbone storm drain system capacity or existing condition peak flow at the project outfall, whichever condition governs.

For all outfalls, proposed condition unmitigated peak flows are greater than existing condition peak flows. The existing condition 100-year peak flow of Outfall A near the southwest corner of the site is 15.7 cfs, whereas the proposed condition 100-year peak flow is 23.6 cfs. For outfall B (which represents flow from Systems 1000, 2000, 8000, and 9500), the unmitigated 100-year post-project flow rates are increased from 57.7 cfs to 101.9 cfs. Outfall E that represents flow from System 11000 increases 100-year post-project flow rates from 21.7 cfs to 39.6 cfs. Finally, Outfalls C and D (which represents flow in Systems 16000 and 18500, respectively) increase 100-year post-project flow rates from 8.3 cfs to 18.0 cfs and from 19.8 cfs to 31.0 cfs, respectively. However, preliminary detention modeling was performed for a couple of representative basins, and peak flows after detention are significantly less than the existing flows and backbone flows. During

final engineering, calculations will be prepared for all basins to show the final detained flow rates out of the detention basins. The combination of basins will be sufficient to ensure the graded total peak 100-year flow rate for the proposed condition is less than the maximum allowable peak flow rate. Therefore, there will be no adverse impact from a peak flow perspective.

For the results of the analysis, see Exhibit A for the existing conditions hydrology map and Exhibit B for the proposed conditions hydrology map in Appendix 6. Refer to the appendices for the hydrology calculations. Table 2 summarizes the hydrology results and compares existing and proposed conditions.

Table 2: Summary of Hydrology Results

	PRELIMINARY TRAILS AT CARMEL MOUNTAIN RANCH HYDROLOGY SUMMARY										
	EXISTING CONDITION				BACKBONE COMPARISON		PROPOSED CONDITION				
OUTFALL OF INTEREST	SYSTEM	AREA (ac)	TC (min)	Q100 (cfs)	BackboneQ [1] Q100 (cfs)	Qallowable If no backbone Q, Qallowable=Qexisting (cfs)	SYSTEM	AREA (ac)	TC (min)	Q100 (cfs)	w/ Detention Q100 [4] (cfs)
	100	8.6	14.5	11.5	10.6		1000	8.5	6.9	24.9	7.0
	200	8.6	14.1	11.6	9.7		2000	8.6	13.0	19.0	4.0
	700	4.1	9.4	6.4	-	6.4	7000	5.3	17.6	6.5	
	750	1.2	10.7	1.8	34.1						
	800	10.8	12.9	15.0	111.3		8000	10.8	8.0	29.1	10.9
	900	10.1	12.9	16.8	4.8		9000	7.0	6.6	23.0	
To POC B	950	0.8	6.4	2.8	-	2.8	9500 [2]	9.8	32.8	5.9	5.9
Outfall	***TOTAL***	***44.2***		***65.9***	***170.5***	***9.2***	***TOTAL***	***43.0***		***85.4***	**<65.9**
	500	2.6	11.9	3.7	2.9		5000	2.6	6.4	8.5	1.0
	600	6.4	8.2	10.5	10.1		6000	7.2	14.7	15.1	4.6
To POC A	650	0.9	8.0	1.5	1.1						
Outfall	***TOTAL***	***9.9***		***15.7***	***14.1***	-	***TOTAL***	***9.8***		***23.6***	**<15.7**
To POC E	1100	14.9	12.6	21.7	15.8		11000	14.9	9.4	39.6	2.0
Outfall	***TOTAL***	***14.9***		***21.7***	***15.8***	-	***TOTAL***	***14.9***		***39.6***	**<21.7**
To POC E	1300	1.3	7.1	2.2	-	2.2	13000	1.3	7.1	2.2	
Outfall	***TOTAL***	***1.3***		***2.2***	-	***2.2***	***TOTAL***	***1.3***		***2.2***	**<2.2**
	1500	3.3	9.8	5.1	-	5.1	15000	3.3	9.8	5.1	
To POC C	1600	5.8	13.5	8.3	-	8.3	16000	5.7	7.5	18.0	2.9
Outfall	***TOTAL***	***9.1***		***13.4***	-	***13.4***	***TOTAL***	***9.0***		***23.1***	**<13.4**
							17000	5.6	9.4	15.9	
	1800	12.6	11.6	18.2	18.1		18000	4.7	7.2	15.1	
To POC D	1850	1.0	8.3	1.6	-	1.6	18500 [3]	14.9	6.0	9.8	9.8
Outfall	**TOTAL**	**13.6**		**19.8**	**18.1**	**1.6**	**TOTAL**	**14.9**		**31.0**	**<19.8**
	GRAND TOTAL	**93.0**		**138.7**	**218.5**	**26.4**	**GRAND TOTAL**	**92.9**		**204.9**	**<138.7**

Notes:

1) Backbone flowrates are based on As-Built Drawings (see Appendix 4)

2) System 9500 represents the combined routing result of Systems 9000 and hillside bypass area

3) System 18500 represents the combined routing result of Systems 17000 and 18000

4) Q100 values are shown as "<x.x" to indicate detained flow rates. During final engineering, detention calculations will be prepared to show the final detained flow rates out of the the detention basins. The combination of basins will be sufficient to ensure the grand total Q100 for the proposed condition is less than the maximum allowable Q100. The preliminary

3.4 Detention Basins

There are 10 detention basins proposed for the project site for water quality treatment and hydromodification management. From the Rational Method results for each of the systems draining to a basin, the proposed condition peak inflow hydrographs were generated with Rick Engineering Rational Method Hydrograph Generator. This program develops a synthetic hydrograph per the 2003 County Hydrology Manual using the results of the Rational Method output.

The inflow hydrograph for each system was then entered into Haestad Method's PondPack software and the detention routing was performed with the design of the detention basin and the proposed outlet structure. The 100-year hydrograph was routed through the basin to demonstrate that the post-development peak flow rate will comply with the detention requirements and that the detention facility will not overtop during the 100-year peak event. The time of concentration coinciding with the basin outflow peak was established by adding the inflow hydrograph time of concentration plus the lag time of the detained flow within the basin. This combined time of concentration accounts for the time of concentration to get to the basin and the detention time within the basin. The riser for each basin was designed to ensure that riser size, rim elevation, and orifice placement will work in conjunction to properly mitigate the increased flow rate.

Preliminary detention modeling has been completed for representative basins Basin 9 and Basin 11. A complete set of detention models will be included during final engineering. The preliminary hydrograph routing calculations and detention models are included in Appendix 5. With detention, the proposed 100-year flow rates at the project outfalls are less than the existing 100-year flow rates.

3.5 Water Quality Calculations

The water quality calculations are included, under separate cover, in the Storm Water Quality Management Plan (SWQMP) prepared by PDC. The biofiltration basins will be combined hydromodification/biofiltration/detention basins.

3.6 Hydromodification Analysis

The biofiltration basins also address hydromodification requirements, since both biofiltration basins and hydromodification basins produce similar alterations to the flow regime for the smaller, more frequent storm events. Flow duration control is the most common form of hydromodification management. The majority of all onsite water will be treated with biofiltration/hydromodification basins, which will detain the smaller, more frequent events and therefore will mitigate the post-development onsite flows. Refer to the Hydromodification report prepared by PDC for detailed calculations.

4. CONCLUSION

This drainage report supports the VTM for the proposed Trails at Carmel Mountain Ranch development. This report was prepared to ensure that project development would not adversely affect existing drainage patterns. Hydrology calculations indicate that redevelopment will result in an overall increase in flows from the site, but the total flow rates after detention is less than or equal to existing flow. Small onsite re-direction of flows does not alter general drainage patterns as onsite storm drain systems ultimately discharge to the same location downstream of the project. As such, the project redevelopment should not have an adverse effect on local or global drainage patterns. The drainage system will be designed appropriately to accommodate the peak-flow conditions for the site. Detention calculations and pipe hydraulic calculations will be included during final engineering.

APPENDIX 1

Supporting Documentation

(IDF Curve, Runoff Coefficients, FEMA Firmette)

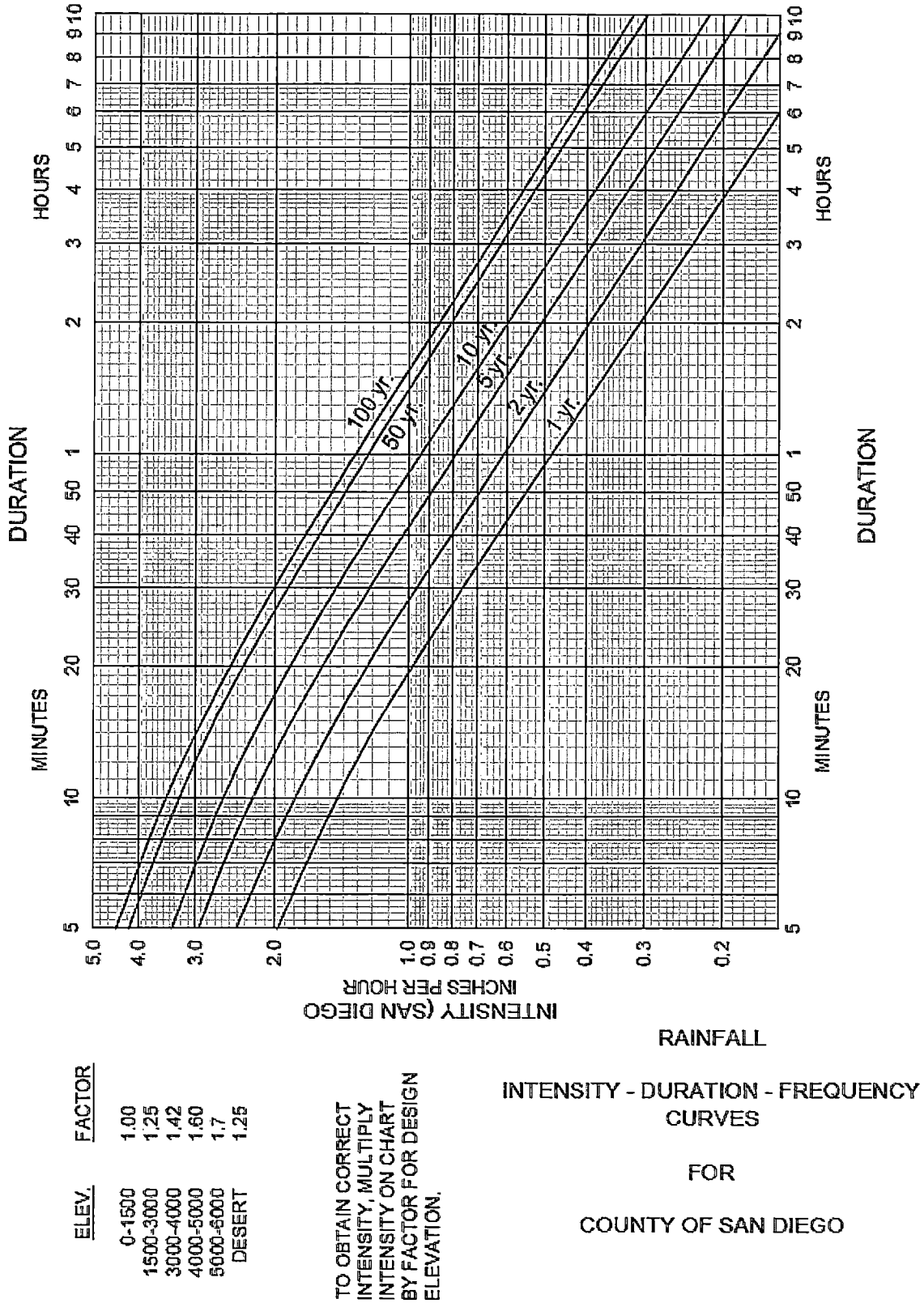


Figure A-1. Intensity-Duration-Frequency Design Chart

Table A-1. Runoff Coefficients for Rational Method

Land Use	Runoff Coefficient (C)
	Soil Type [1]
Residential:	
Single Family	0.55
Multi-Units	0.70
Mobile Homes	0.65
Rural (lots greater than ½ acre)	0.45
Commercial [2]	
80% Impervious	0.85
Industrial [2]	
90% Impervious	0.95

Note:
[1] Type D soil to be used for all areas.
[2] Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%
Tabulated imperviousness = 80%
Revised C = (50/80) x 0.85 = 0.53

The values in Table A–1 are typical for urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the City.



FLOOD HAZARD INFORMATION

E FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- OTHER AREAS OF FLOOD HAZARD
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- OTHER AREAS
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- GENERAL STRUCTURES
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- OTHER FEATURES
  - 20.2 Cross Sections with 1% Annual Chance
  - 17.5 Water Surface Elevation
  - Coastal Transect
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
  - 513 Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 5/6/2019 1:42:39 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980:
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

0 50 100 200 300 400 Meters

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 1352 OF 2300

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF SAN DIEGO CALIFORNIA	060295	1352
CITY OF POWAY CALIFORNIA	060702	1352

MAP NUMBER
06073C1352G
EFFECTIVE DATE
05/16/2012

National Flood Hazard Layer FIRMette

FEMA



0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainag areas of less than one square mile *Zone*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represe an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/6/2019 at 1:45:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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APPENDIX 2

Existing Conditions 100-year Rational Method Computer Output

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/23/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 100 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  106.000(Ft.)
Highest elevation =  801.000(Ft.)
Lowest elevation =  798.000(Ft.)
Elevation difference =    3.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     8.52 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 106.000^.5)/( 2.830^(1/3)]=   8.52
Rainfall intensity (I) =      3.577(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.290(CFS)
Total initial stream area =        0.180(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
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```
Upstream point elevation =   798.000(Ft.)
Downstream point elevation =   733.000(Ft.)
Channel length thru subarea  =  1190.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      7.090(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      7.090(CFS)
Depth of flow =   0.225(Ft.), Average velocity =   3.308(Ft/s)
Channel flow top width =   14.016(Ft.)
Flow Velocity =    3.31(Ft/s)
Travel time  =    5.99 min.
Time of concentration =   14.51 min.
Critical depth =      0.277(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      2.942(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =     11.188(CFS) for    8.450(Ac.)
Total runoff =     11.477(CFS)  Total area =        8.63(Ac.)
End of computations, total study area =          8.630 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 10/07/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 200 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  100.000(Ft.)
Highest elevation =  711.000(Ft.)
Lowest elevation =  706.500(Ft.)
Elevation difference =    4.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     7.09 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 100.000^.5)/( 4.500^(1/3)]=   7.09
Rainfall intensity (I) =      3.829(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.293(CFS)
Total initial stream area =        0.170(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
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```
Upstream point elevation =   706.500(Ft.)
Downstream point elevation =   610.000(Ft.)
Channel length thru subarea  =  1500.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      7.589(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      7.589(CFS)
Depth of flow =   0.224(Ft.), Average velocity =   3.577(Ft/s)
Channel flow top width =   13.955(Ft.)
Flow Velocity =    3.58(Ft/s)
Travel time  =    6.99 min.
Time of concentration =   14.08 min.
Critical depth =      0.287(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      2.976(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =     11.345(CFS) for    8.470(Ac.)
Total runoff =     11.638(CFS)  Total area =        8.64(Ac.)
End of computations, total study area =          8.640 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/19/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 500 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      500.000 to Point/Station      501.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  135.000(Ft.)
Highest elevation =  564.000(Ft.)
Lowest elevation =  561.000(Ft.)
Elevation difference =    3.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =    10.42 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 135.000^.5)/( 2.222^(1/3)]=  10.42
Rainfall intensity (I) =      3.325(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.344(CFS)
Total initial stream area =        0.230(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
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```
Upstream point elevation =   561.000(Ft.)
Downstream point elevation =   540.000(Ft.)
Channel length thru subarea  =   250.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      2.132(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      2.132(CFS)
Depth of flow =   0.109(Ft.), Average velocity =   2.738(Ft/s)
Channel flow top width =    9.343(Ft.)
Flow Velocity =    2.74(Ft/s)
Travel time  =    1.52 min.
Time of concentration =   11.94 min.
Critical depth =      0.146(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.164(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      3.403(CFS) for    2.390(Ac.)
Total runoff =      3.747(CFS)  Total area =        2.62(Ac.)
End of computations, total study area =          2.620 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/25/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 600 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      600.000 to Point/Station      601.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   83.000(Ft.)
Highest elevation =  641.000(Ft.)
Lowest elevation =  612.000(Ft.)
Elevation difference =   29.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.26 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  83.000^.5)/(  34.940^(1/3)]=   3.26
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.237(CFS)
Total initial stream area =        0.120(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      601.000 to Point/Station      602.000
**** IMPROVED CHANNEL TRAVEL TIME ****
```



```
------------------------------------------------------------------------
Upstream point elevation =   612.000(Ft.)
Downstream point elevation =   566.000(Ft.)
Channel length thru subarea  =   615.000(Ft.)
Channel base width       =     5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      4.859(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =     2.000(Ft.)
Flow(q) thru subarea =       4.859(CFS)
Depth of flow =   0.172(Ft.), Average velocity =   3.338(Ft/s)
Channel flow top width =   11.893(Ft.)
Flow Velocity =     3.34(Ft/s)
Travel time  =     3.07 min.
Time of concentration =     8.07 min.
Critical depth =       0.229(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =       3.648(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =       7.682(CFS) for     4.680(Ac.)
Total runoff =      7.919(CFS)  Total area =         4.80(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      604.000 to Point/Station      602.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =     8.07 min.
Rainfall intensity =       3.648(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =       1.707(CFS) for     1.040(Ac.)
Total runoff =      9.626(CFS)  Total area =         5.84(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      602.000 to Point/Station      603.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =   566.000(Ft.)
Downstream point/station elevation =   550.000(Ft.)
Pipe length  =   116.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =     9.626(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     9.626(CFS)
Normal flow depth in pipe =    8.41(In.)
Flow top width inside pipe =   10.99(In.)
Critical depth could not be calculated.
Pipe flow velocity =     16.36(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =     8.19 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      603.000 to Point/Station      603.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =     8.19 min.
Rainfall intensity =      3.628(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =       0.865(CFS) for    0.530(Ac.)
Total runoff =     10.492(CFS)  Total area =        6.37(Ac.)
End of computations, total study area =          6.370 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/25/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 650 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      650.000 to Point/Station      651.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   86.000(Ft.)
Highest elevation =  595.000(Ft.)
Lowest elevation =  576.000(Ft.)
Elevation difference =   19.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.87 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  86.000^.5)/(  22.093^(1/3)]=   3.87
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.435(CFS)
Total initial stream area =        0.220(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      651.000 to Point/Station      652.000
**** IMPROVED CHANNEL TRAVEL TIME ****
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--------------------------------------------------------------------------
Upstream point elevation =   576.000(Ft.)
Downstream point elevation =   563.000(Ft.)
Channel length thru subarea  =   320.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      1.076(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      1.076(CFS)
Depth of flow =   0.091(Ft.), Average velocity =   1.728(Ft/s)
Channel flow top width =    8.651(Ft.)
Flow Velocity =    1.73(Ft/s)
Travel time  =    3.09 min.
Time of concentration =    8.09 min.
Critical depth =      0.099(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.645(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      1.066(CFS) for    0.650(Ac.)
Total runoff =     1.501(CFS)  Total area =        0.87(Ac.)
End of computations, total study area =          0.870 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 700 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      700.000 to Point/Station      701.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   64.000(Ft.)
Highest elevation =  682.500(Ft.)
Lowest elevation =  675.000(Ft.)
Elevation difference =    7.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     4.12 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  64.000^.5)/(  11.719^(1/3)]=   4.12
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.454(CFS)
Total initial stream area =        0.230(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      701.000 to Point/Station      702.000
**** IMPROVED CHANNEL TRAVEL TIME ****
```



```
--------------------------------------------------------------------------
Upstream point elevation =   675.000(Ft.)
Downstream point elevation =   640.000(Ft.)
Channel length thru subarea  =   705.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      4.227(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      4.227(CFS)
Depth of flow =   0.172(Ft.), Average velocity =   2.647(Ft/s)
Channel flow top width =   13.590(Ft.)
Flow Velocity =    2.65(Ft/s)
Travel time  =    4.44 min.
Time of concentration =    9.44 min.
Critical depth =      0.203(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.445(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      5.922(CFS) for    3.820(Ac.)
Total runoff =      6.377(CFS)  Total area =        4.05(Ac.)
End of computations, total study area =          4.050 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 750 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      750.000 to Point/Station      751.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  120.000(Ft.)
Highest elevation =  657.000(Ft.)
Lowest elevation =  653.000(Ft.)
Elevation difference =    4.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     8.58 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 120.000^.5)/( 3.333^(1/3)]=   8.58
Rainfall intensity (I) =      3.567(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.385(CFS)
Total initial stream area =        0.240(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      751.000 to Point/Station      752.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
```



```
Upstream point elevation =   653.000(Ft.)
Downstream point elevation =   633.000(Ft.)
Channel length thru subarea  =   270.000(Ft.)
Channel base width       =     5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      1.156(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      1.156(CFS)
Depth of flow =   0.079(Ft.), Average velocity =   2.100(Ft/s)
Channel flow top width =    8.946(Ft.)
Flow Velocity =    2.10(Ft/s)
Travel time  =    2.14 min.
Time of concentration =   10.72 min.
Critical depth =      0.100(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.290(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      1.421(CFS) for    0.960(Ac.)
Total runoff =     1.807(CFS)  Total area =        1.20(Ac.)
End of computations, total study area =          1.200 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/24/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 800 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      800.000 to Point/Station      801.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  120.000(Ft.)
Highest elevation =  727.000(Ft.)
Lowest elevation =  713.500(Ft.)
Elevation difference =   13.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     5.72 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 120.000^.5)/(11.250^(1/3)]=   5.72
Rainfall intensity (I) =      4.158(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.243(CFS)
Total initial stream area =        0.130(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      801.000 to Point/Station      802.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
```



```
Upstream point elevation =   713.500(Ft.)
Downstream point elevation =   630.000(Ft.)
Channel length thru subarea  =  1560.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =     10.225(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     10.225(CFS)
Depth of flow =   0.271(Ft.), Average velocity =   3.626(Ft/s)
Channel flow top width =   15.830(Ft.)
Flow Velocity =    3.63(Ft/s)
Travel time  =    7.17 min.
Time of concentration =   12.89 min.
Critical depth =      0.336(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.076(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =     14.770(CFS) for   10.670(Ac.)
Total runoff =     15.013(CFS)  Total area =       10.80(Ac.)
End of computations, total study area =         10.800 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/24/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 900 - EXISTING CONDITION
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      900.000 to Point/Station      901.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   85.000(Ft.)
Highest elevation =  809.000(Ft.)
Lowest elevation =  804.500(Ft.)
Elevation difference =    4.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     6.19 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  85.000^.5)/( 5.294^(1/3)]=   6.19
Rainfall intensity (I) =     4.032(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.218(CFS)
Total initial stream area =        0.120(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      901.000 to Point/Station      902.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
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```
Upstream point elevation =   804.500(Ft.)
Downstream point elevation =   733.000(Ft.)
Channel length thru subarea  =  1400.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      9.289(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      9.289(CFS)
Depth of flow =   0.261(Ft.), Average velocity =   3.474(Ft/s)
Channel flow top width =   15.458(Ft.)
Flow Velocity =    3.47(Ft/s)
Travel time  =    6.72 min.
Time of concentration =   12.91 min.
Critical depth =      0.318(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.540 given for subarea
Rainfall intensity =      3.075(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.540
Subarea runoff =     16.603(CFS) for   10.000(Ac.)
Total runoff =     16.821(CFS)  Total area =       10.12(Ac.)
End of computations, total study area =          10.120 (Ac.)
```

Table 1: S900E100 Area Weighted Rational Method "C" Coefficient

Land Use Type	Area (SF)	% of DMA	Land Use "C" Coefficient	Area-Weighted "C" Coefficient
Parking Lot	102627	23.3%	0.85	**0.543**
Pervious Area	338409	76.7%	0.45	

Total Area (SF)=	441036
Total Area (AC)=	10.1

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/24/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 950 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)   =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      950.000 to Point/Station      951.000
**** 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
[COMMERCIAL area type                    ]
Note: user entry of impervious value, Ap = 0.850
Initial subarea flow distance  =  120.000(Ft.)
Highest elevation =  808.000(Ft.)
Lowest elevation =  802.000(Ft.)
Elevation difference =    6.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.27 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.9031)*( 120.000^.5)/(   5.000^(1/3)]=   2.27
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.903
Subarea runoff =      0.713(CFS)
Total initial stream area =        0.180(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      951.000 to Point/Station      952.000
```



```
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
--------------------------------------------------------------------------
Top of street segment elevation =   802.000(Ft.)
End of street segment elevation =   789.000(Ft.)
Length of street segment   =   255.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  10.000(Ft.)
Distance from crown to crossfall grade break  =   9.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  20.000(Ft.)
Slope from curb to property line (v/hz) =   0.000
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =      1.962(CFS)
Depth of flow =   0.279(Ft.), Average velocity =   3.115(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   5.611(Ft.)
Flow velocity =   3.12(Ft/s)
Travel time =    1.36 min.     TC =    6.36  min.
 Adding area flow to street
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
[COMMERCIAL area type                    ]
Rainfall intensity =      3.988(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      2.136(CFS) for    0.630(Ac.)
Total runoff =      2.849(CFS)  Total area =        0.81(Ac.)
Street flow at end of street =      2.849(CFS)
Half street flow at end of street =      1.425(CFS)
Depth of flow =   0.296(Ft.), Average velocity =   3.432(Ft/s)
Flow width (from curb towards crown)=   6.443(Ft.)
End of computations, total study area =          0.810 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/27/19
------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1100 - EXISTING CONDITION
100-YEAR STORM EVENT
EXISTING CONDITION
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1000.000 to Point/Station     1001.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  155.000(Ft.)
Highest elevation =  784.000(Ft.)
Lowest elevation =  757.000(Ft.)
Elevation difference =   27.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     5.62 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 155.000^.5)/(17.419^(1/3)]=   5.62
Rainfall intensity (I) =      4.187(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.678(CFS)
Total initial stream area =        0.360(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1001.000 to Point/Station     1002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =   757.000(Ft.)
```



```
Downstream point elevation =   641.000(Ft.)
Channel length thru subarea  =  1645.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =     11.654(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     11.654(CFS)
Depth of flow =   0.258(Ft.), Average velocity =   3.953(Ft/s)
Channel flow top width =   17.883(Ft.)
Flow Velocity =    3.95(Ft/s)
Travel time  =    6.94 min.
Time of concentration =   12.55 min.
Critical depth =      0.336(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.106(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =     16.284(CFS) for   11.650(Ac.)
Total runoff =     16.963(CFS)  Total area =       12.01(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1001.000 to Point/Station     1002.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     12.010(Ac.)
Runoff from this stream =     16.963(CFS)
Time of concentration =   12.55 min.
Rainfall intensity =     3.106(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1003.000 to Point/Station     1004.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  100.000(Ft.)
Highest elevation =  679.000(Ft.)
Lowest elevation =  663.000(Ft.)
Elevation difference =   16.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     4.64 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 100.000^.5)/(  16.000^(1/3)]=   4.64
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.257(CFS)
Total initial stream area =        0.130(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1004.000 to Point/Station     1005.000
**** IMPROVED CHANNEL TRAVEL TIME ****

------------------------------------------------------------------------------
Upstream point elevation =   663.000(Ft.)
Downstream point elevation =   654.000(Ft.)
Channel length thru subarea  =   380.000(Ft.)
Channel base width       =   5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      3.012(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      3.012(CFS)
Depth of flow =   0.181(Ft.), Average velocity =   1.930(Ft/s)
Channel flow top width =   12.241(Ft.)
Flow Velocity =    1.93(Ft/s)
Travel time  =    3.28 min.
Time of concentration =    8.28 min.
Critical depth =      0.176(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.613(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      4.537(CFS) for    2.790(Ac.)
Total runoff =      4.793(CFS)  Total area =        2.92(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1005.000 to Point/Station     1002.000
**** IMPROVED CHANNEL TRAVEL TIME ****

------------------------------------------------------------------------------
Upstream point elevation =   654.000(Ft.)
Downstream point elevation =   642.000(Ft.)
Channel length thru subarea  =   480.000(Ft.)
Channel base width       =   4.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      4.793(CFS)
Depth of flow =   0.240(Ft.), Average velocity =   2.264(Ft/s)
Channel flow top width =   13.617(Ft.)
Flow Velocity =    2.26(Ft/s)
Travel time  =    3.53 min.
Time of concentration =   11.82 min.
Critical depth =      0.242(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1005.000 to Point/Station     1002.000
**** CONFLUENCE OF MINOR STREAMS ****

------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.920(Ac.)
Runoff from this stream =      4.793(CFS)
Time of concentration =   11.82 min.
Rainfall intensity =     3.176(In/Hr)
```



```
Summary of stream data:

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


1       16.963     12.55                  3.106
2        4.793     11.82                  3.176
Qmax(1) =
          1.000 *    1.000 *    16.963) +
          0.978 *    1.000 *     4.793) + =      21.651
Qmax(2) =
          1.000 *    0.941 *    16.963) +
          1.000 *    1.000 *     4.793) + =      20.758

Total of 2 streams to confluence:
Flow rates before confluence point:
     16.963       4.793
Maximum flow rates at confluence using above data:
      21.651       20.758
Area of streams before confluence:
      12.010        2.920
Results of confluence:
Total flow rate =     21.651(CFS)
Time of concentration =    12.555 min.
Effective stream area after confluence =     14.930(Ac.)
End of computations, total study area =          14.930 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1300 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1300.000 to Point/Station     1301.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   81.000(Ft.)
Highest elevation =  586.000(Ft.)
Lowest elevation =  579.000(Ft.)
Elevation difference =    7.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     5.13 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  81.000^.5)/( 8.642^(1/3)]=   5.13
Rainfall intensity (I) =      4.343(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.371(CFS)
Total initial stream area =        0.190(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1301.000 to Point/Station     1302.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
```



```
Upstream point elevation =   579.000(Ft.)
Downstream point elevation =   577.000(Ft.)
Channel length thru subarea  =   143.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      1.427(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      1.427(CFS)
Depth of flow =   0.137(Ft.), Average velocity =   1.239(Ft/s)
Channel flow top width =   11.840(Ft.)
Flow Velocity =    1.24(Ft/s)
Travel time  =    1.92 min.
Time of concentration =    7.06 min.
Critical depth =      0.112(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.835(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      1.864(CFS) for    1.080(Ac.)
Total runoff =      2.235(CFS)  Total area =        1.27(Ac.)
End of computations, total study area =          1.270 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
       Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1500 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1500.000 to Point/Station     1501.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   77.000(Ft.)
Highest elevation =  647.000(Ft.)
Lowest elevation =  644.000(Ft.)
Elevation difference =    3.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     6.52 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  77.000^.5)/( 3.896^(1/3)]=   6.52
Rainfall intensity (I) =      3.951(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.427(CFS)
Total initial stream area =        0.240(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1501.000 to Point/Station     1502.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
```



```
Upstream point elevation =   644.000(Ft.)
Downstream point elevation =   620.000(Ft.)
Channel length thru subarea  =   480.000(Ft.)
Channel base width       =     5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      3.129(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =     2.000(Ft.)
Flow(q) thru subarea =      3.129(CFS)
Depth of flow =   0.148(Ft.), Average velocity =   2.442(Ft/s)
Channel flow top width =   12.375(Ft.)
Flow Velocity =    2.44(Ft/s)
Travel time  =    3.28 min.
Time of concentration =     9.80 min.
Critical depth =      0.172(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.399(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      4.649(CFS) for    3.040(Ac.)
Total runoff =      5.076(CFS)  Total area =        3.28(Ac.)
End of computations, total study area =          3.280 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/17/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1600 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1600.000 to Point/Station     1601.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =  105.000(Ft.)
Highest elevation =  667.000(Ft.)
Lowest elevation =  659.000(Ft.)
Elevation difference =    8.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     6.09 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 105.000^.5)/( 7.619^(1/3)]=   6.09
Rainfall intensity (I) =      4.056(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.602(CFS)
Total initial stream area =        0.330(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1601.000 to Point/Station     1602.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
```



```
Upstream point elevation =   659.000(Ft.)
Downstream point elevation =   652.600(Ft.)
Channel length thru subarea  =   190.000(Ft.)
Channel base width       =     5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      2.601(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =     2.000(Ft.)
Flow(q) thru subarea =       2.601(CFS)
Depth of flow =   0.153(Ft.), Average velocity =   2.101(Ft/s)
Channel flow top width =   11.138(Ft.)
Flow Velocity =    2.10(Ft/s)
Travel time  =    1.51 min.
Time of concentration =    7.60 min.
Critical depth =      0.162(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.730(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      3.676(CFS) for    2.190(Ac.)
Total runoff =      4.278(CFS)  Total area =        2.52(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1602.000 to Point/Station     1603.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =   652.600(Ft.)
Downstream point elevation =   620.000(Ft.)
Channel length thru subarea  =   670.000(Ft.)
Channel base width       =     4.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =     2.000(Ft.)
Flow(q) thru subarea =      4.278(CFS)
Depth of flow =   0.243(Ft.), Average velocity =   3.917(Ft/s)
Channel flow top width =    4.974(Ft.)
Flow Velocity =    3.92(Ft/s)
Travel time  =    2.85 min.
Time of concentration =   10.45 min.
Critical depth =      0.313(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1602.000 to Point/Station     1603.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.520(Ac.)
Runoff from this stream =      4.278(CFS)
Time of concentration =   10.45 min.
Rainfall intensity =     3.321(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1604.000 to Point/Station     1605.000
```

```
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   96.000(Ft.)
Highest elevation =  659.000(Ft.)
Lowest elevation =  657.500(Ft.)
Elevation difference =    1.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     9.88 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  96.000^.5)/( 1.563^(1/3)]=   9.88
Rainfall intensity (I) =      3.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.397(CFS)
Total initial stream area =        0.260(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1605.000 to Point/Station     1606.000
**** IMPROVED CHANNEL TRAVEL TIME ****
-------------------------------------------------------------------------
Upstream point elevation =   657.500(Ft.)
Downstream point elevation =   634.000(Ft.)
Channel length thru subarea  =   500.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      2.661(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      2.661(CFS)
Depth of flow =   0.138(Ft.), Average velocity =   2.282(Ft/s)
Channel flow top width =   11.901(Ft.)
Flow Velocity =    2.28(Ft/s)
Travel time  =    3.65 min.
Time of concentration =   13.53 min.
Critical depth =      0.158(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.021(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      4.038(CFS) for    2.970(Ac.)
Total runoff =      4.434(CFS)  Total area =       3.23(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1606.000 to Point/Station     1603.000
**** CONFLUENCE OF MINOR STREAMS ****
-------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =      4.434(CFS)
Time of concentration =   13.53 min.
Rainfall intensity =     3.021(In/Hr)
```



```
Summary of stream data:

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


1        4.278     10.45                  3.321
2        4.434     13.53                  3.021
Qmax(1) =
          1.000 *    1.000 *     4.278) +
          1.000 *    0.772 *     4.434) + =       7.703
Qmax(2) =
          0.910 *    1.000 *     4.278) +
          1.000 *    1.000 *     4.434) + =       8.326

Total of 2 streams to confluence:
Flow rates before confluence point:
      4.278       4.434
Maximum flow rates at confluence using above data:
      7.703       8.326
Area of streams before confluence:
      2.520       3.230
Results of confluence:
Total flow rate =      8.326(CFS)
Time of concentration =    13.531 min.
Effective stream area after confluence =      5.750(Ac.)
End of computations, total study area =          5.750 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1750 - EXISTING CONDITIONS
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1750.000 to Point/Station     1751.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   90.000(Ft.)
Highest elevation =  701.000(Ft.)
Lowest elevation =  700.000(Ft.)
Elevation difference =    1.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =    10.72 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  90.000^.5)/( 1.111^(1/3)]=  10.72
Rainfall intensity (I) =      3.291(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.237(CFS)
Total initial stream area =        0.160(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1751.000 to Point/Station     1752.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
```



```
Upstream point elevation =   700.000(Ft.)
Downstream point elevation =   693.000(Ft.)
Channel length thru subarea  =    68.000(Ft.)
Channel base width       =    4.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      0.437(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      0.437(CFS)
Depth of flow =   0.047(Ft.), Average velocity =   1.802(Ft/s)
Channel flow top width =    6.343(Ft.)
Flow Velocity =    1.80(Ft/s)
Travel time  =    0.63 min.
Time of concentration =   11.35 min.
Critical depth =      0.063(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.223(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.392(CFS) for    0.270(Ac.)
Total runoff =      0.629(CFS)  Total area =        0.43(Ac.)
End of computations, total study area =          0.430 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 04/01/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1800 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1800.000 to Point/Station     1801.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   80.000(Ft.)
Highest elevation =  805.000(Ft.)
Lowest elevation =  801.000(Ft.)
Elevation difference =    4.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     6.12 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  80.000^.5)/( 5.000^(1/3)]=   6.12
Rainfall intensity (I) =      4.049(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.401(CFS)
Total initial stream area =        0.220(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1801.000 to Point/Station     1802.000
**** IMPROVED CHANNEL TRAVEL TIME ****
__________________________________________________________________________
```



```
Upstream point elevation =   801.000(Ft.)
Downstream point elevation =   680.000(Ft.)
Channel length thru subarea  =  1300.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      6.615(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      6.615(CFS)
Depth of flow =   0.191(Ft.), Average velocity =   3.937(Ft/s)
Channel flow top width =   12.626(Ft.)
Flow Velocity =    3.94(Ft/s)
Travel time  =    5.50 min.
Time of concentration =   11.62 min.
Critical depth =      0.268(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.195(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      9.806(CFS) for    6.820(Ac.)
Total runoff =     10.207(CFS)  Total area =        7.04(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1803.000 to Point/Station     1802.000
**** SUBAREA FLOW ADDITION ****
__________________________________________________________________________
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =    11.62 min.
Rainfall intensity =      3.195(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      8.009(CFS) for    5.570(Ac.)
Total runoff =     18.215(CFS)  Total area =       12.61(Ac.)
End of computations, total study area =          12.610 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/24/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1850 - EXISTING CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1850.000 to Point/Station     1851.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   86.000(Ft.)
Highest elevation =  794.000(Ft.)
Lowest elevation =  791.000(Ft.)
Elevation difference =    3.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     7.15 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  86.000^.5)/( 3.488^(1/3)]=   7.15
Rainfall intensity (I) =      3.815(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.206(CFS)
Total initial stream area =        0.120(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1851.000 to Point/Station     1852.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
```



```
Upstream point elevation =   791.000(Ft.)
Downstream point elevation =   781.000(Ft.)
Channel length thru subarea  =   135.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      0.918(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      0.918(CFS)
Depth of flow =   0.071(Ft.), Average velocity =   2.020(Ft/s)
Channel flow top width =    7.834(Ft.)
Flow Velocity =    2.02(Ft/s)
Travel time  =    1.11 min.
Time of concentration =    8.27 min.
Critical depth =      0.090(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.616(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      1.350(CFS) for    0.830(Ac.)
Total runoff =      1.556(CFS)  Total area =        0.95(Ac.)
End of computations, total study area =          0.950 (Ac.)
```

APPENDIX 3

Proposed Conditions 100-year Rational Method Computer Output

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 10/01/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 1000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1000.000 to Point/Station     1001.000
**** INITIAL AREA EVALUATION ****
--------------------------------------------------------------------------
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   83.000(Ft.)
Highest elevation =  792.000(Ft.)
Lowest elevation =  776.500(Ft.)
Elevation difference =   15.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     1.55 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  83.000^.5)/(  18.675^(1/3)]=   1.55
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.672(CFS)
Total initial stream area =        0.180(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1001.000 to Point/Station     1003.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
Upstream point elevation =   776.500(Ft.)
Downstream point elevation =   730.000(Ft.)
Channel length thru subarea  =   770.000(Ft.)
```



```
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =     12.460(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     12.460(CFS)
Depth of flow =   0.206(Ft.), Average velocity =   6.623(Ft/s)
Channel flow top width =   13.248(Ft.)
Flow Velocity =    6.62(Ft/s)
Travel time  =    1.94 min.
Time of concentration =    6.94 min.
Critical depth =      0.367(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.859(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     20.732(CFS) for    6.320(Ac.)
Total runoff =     21.404(CFS)  Total area =        6.50(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1002.000 to Point/Station     1003.000
**** SUBAREA FLOW ADDITION ****
--------------------------------------------------------------------------
User specified 'C' value of 0.450 given for subarea
Time of concentration =    6.94 min.
Rainfall intensity =      3.859(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      2.622(CFS) for    1.510(Ac.)
Total runoff =     24.026(CFS)  Total area =        8.01(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1003.000 to Point/Station     1003.000
**** SUBAREA FLOW ADDITION ****
--------------------------------------------------------------------------
User specified 'C' value of 0.450 given for subarea
Time of concentration =    6.94 min.
Rainfall intensity =      3.859(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.834(CFS) for    0.480(Ac.)
Total runoff =     24.860(CFS)  Total area =        8.49(Ac.)
End of computations, total study area =          8.490 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 10/07/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 2000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)   =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     2000.000 to Point/Station     2001.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Initial subarea flow distance  =  100.000(Ft.)
Highest elevation =  711.000(Ft.)
Lowest elevation =  706.500(Ft.)
Elevation difference =    4.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     7.09 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 100.000^.5)/( 4.500^(1/3)]=   7.09
Rainfall intensity (I) =      3.829(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.293(CFS)
Total initial stream area =        0.170(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     2001.000 to Point/Station     2002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =   706.500(Ft.)
Downstream point elevation =   690.000(Ft.)
Channel length thru subarea  =   470.000(Ft.)
Channel base width      =    5.000(Ft.)
```



```
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      2.498(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      2.498(CFS)
Depth of flow =   0.149(Ft.), Average velocity =   2.108(Ft/s)
Channel flow top width =   10.947(Ft.)
Flow Velocity =    2.11(Ft/s)
Travel time  =    3.72 min.
Time of concentration =   10.80 min.
Critical depth =      0.158(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.450 given for subarea
Rainfall intensity =      3.281(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      3.780(CFS) for    2.560(Ac.)
Total runoff =      4.073(CFS)  Total area =        2.73(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     2002.000 to Point/Station     2003.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =   690.000(Ft.)
Downstream point elevation =   620.000(Ft.)
Channel length thru subarea  =   855.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      8.198(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      8.198(CFS)
Depth of flow =   0.154(Ft.), Average velocity =   6.571(Ft/s)
Channel flow top width =   11.172(Ft.)
Flow Velocity =    6.57(Ft/s)
Travel time  =    2.17 min.
Time of concentration =   12.97 min.
Critical depth =      0.299(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.069(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     14.425(CFS) for    5.530(Ac.)
Total runoff =     18.498(CFS)  Total area =        8.26(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     2003.000 to Point/Station     2003.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =    12.97 min.
Rainfall intensity =      3.069(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.525(CFS) for    0.380(Ac.)
Total runoff =     19.023(CFS)  Total area =        8.64(Ac.)
End of computations, total study area =          8.640 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/19/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 5000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     5000.000 to Point/Station     5001.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   88.000(Ft.)
Highest elevation =  564.000(Ft.)
Lowest elevation =  560.000(Ft.)
Elevation difference =    4.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.55 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  88.000^.5)/(   4.545^(1/3)]=   2.55
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.858(CFS)
Total initial stream area =        0.230(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     5001.000 to Point/Station     5002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =   560.000(Ft.)
Downstream point elevation =   550.000(Ft.)
Channel length thru subarea  =   335.000(Ft.)
```



```
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      4.794(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      4.794(CFS)
Depth of flow =   0.152(Ft.), Average velocity =   3.931(Ft/s)
Channel flow top width =   11.070(Ft.)
Flow Velocity =    3.93(Ft/s)
Travel time  =    1.42 min.
Time of concentration =    6.42 min.
Critical depth =      0.227(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.975(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method, Q=KCIA, C = 0.850
Subarea runoff =      7.129(CFS) for    2.110(Ac.)
Total runoff =      7.987(CFS)  Total area =        2.34(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     5002.000 to Point/Station     5002.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =     6.42 min.
Rainfall intensity =      3.975(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method, Q=KCIA, C = 0.450
Subarea runoff =      0.501(CFS) for    0.280(Ac.)
Total runoff =      8.488(CFS)  Total area =        2.62(Ac.)
End of computations, total study area =          2.620 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 04/06/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 6000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     6000.000 to Point/Station     6001.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Initial subarea flow distance  =  110.000(Ft.)
Highest elevation =  677.000(Ft.)
Lowest elevation =  675.000(Ft.)
Elevation difference =    2.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =    10.05 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 110.000^.5)/( 1.818^(1/3)]=  10.05
Rainfall intensity (I) =      3.368(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.303(CFS)
Total initial stream area =        0.200(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     6001.000 to Point/Station     6002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
__________________________________________________________________________
Upstream point elevation =   675.000(Ft.)
Downstream point elevation =   615.000(Ft.)
Channel length thru subarea  =   505.000(Ft.)
Channel base width      =    5.000(Ft.)
```



```
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      1.887(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      1.887(CFS)
Depth of flow =   0.093(Ft.), Average velocity =   2.977(Ft/s)
Channel flow top width =    8.701(Ft.)
Flow Velocity =    2.98(Ft/s)
Travel time  =    2.83 min.
Time of concentration =   12.88 min.
Critical depth =      0.136(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.450 given for subarea
Rainfall intensity =      3.077(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      2.894(CFS) for    2.090(Ac.)
Total runoff =      3.197(CFS)  Total area =        2.29(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     6002.000 to Point/Station     6003.000
**** IMPROVED CHANNEL TRAVEL TIME ****
__________________________________________________________________________
Upstream point elevation =   615.000(Ft.)
Downstream point elevation =   560.000(Ft.)
Channel length thru subarea  =   670.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      6.450(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      6.450(CFS)
Depth of flow =   0.136(Ft.), Average velocity =   6.138(Ft/s)
Channel flow top width =   10.443(Ft.)
Flow Velocity =    6.14(Ft/s)
Travel time  =    1.82 min.
Time of concentration =   14.70 min.
Critical depth =      0.266(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      2.928(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     11.596(CFS) for    4.660(Ac.)
Total runoff =     14.793(CFS)  Total area =        6.95(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     6003.000 to Point/Station     6003.000
**** SUBAREA FLOW ADDITION ****
__________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =    14.70 min.
Rainfall intensity =      2.928(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.303(CFS) for    0.230(Ac.)
Total runoff =     15.096(CFS)  Total area =        7.18(Ac.)
End of computations, total study area =           7.180 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 7000 - PROPOSED CONDITIONS
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     7000.000 to Point/Station     7001.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
User specified 'C' value of 0.450 given for subarea
Initial subarea flow distance  =  110.000(Ft.)
Highest elevation =  660.000(Ft.)
Lowest elevation =  658.900(Ft.)
Elevation difference =    1.100(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =    12.27 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*( 110.000^.5)/( 1.000^(1/3)]=  12.27
Rainfall intensity (I) =      3.132(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.423(CFS)
Total initial stream area =        0.300(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     7001.000 to Point/Station     7002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =   658.900(Ft.)
Downstream point elevation =   636.000(Ft.)
Channel length thru subarea  =   650.000(Ft.)
Channel base width      =    5.000(Ft.)
```



```
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      2.544(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      2.544(CFS)
Depth of flow =   0.145(Ft.), Average velocity =   2.031(Ft/s)
Channel flow top width =   12.258(Ft.)
Flow Velocity =    2.03(Ft/s)
Travel time  =    5.33 min.
Time of concentration =   17.60 min.
Critical depth =      0.154(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.450 given for subarea
Rainfall intensity =      2.725(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      3.691(CFS) for    3.010(Ac.)
Total runoff =      4.114(CFS)  Total area =        3.31(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     7003.000 to Point/Station     7002.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =    17.60 min.
Rainfall intensity =      2.725(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      2.379(CFS) for    1.940(Ac.)
Total runoff =      6.493(CFS)  Total area =        5.25(Ac.)
End of computations, total study area =          5.250 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 10/01/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 8000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)   =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     8000.000 to Point/Station     8001.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =  120.000(Ft.)
Highest elevation =  700.000(Ft.)
Lowest elevation =  688.000(Ft.)
Elevation difference =   12.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.29 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*( 120.000^.5)/(  10.000^(1/3)]=   2.29
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.746(CFS)
Total initial stream area =        0.200(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     8001.000 to Point/Station     8002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =   688.000(Ft.)
Downstream point elevation =   640.000(Ft.)
Channel length thru subarea  =  1100.000(Ft.)
```



```
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =     14.550(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     14.550(CFS)
Depth of flow =   0.241(Ft.), Average velocity =   6.140(Ft/s)
Channel flow top width =   14.648(Ft.)
Flow Velocity =    6.14(Ft/s)
Travel time  =    2.99 min.
Time of concentration =    7.99 min.
Critical depth =      0.398(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.662(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     23.035(CFS) for    7.400(Ac.)
Total runoff =     23.781(CFS)  Total area =        7.60(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     8003.000 to Point/Station     8002.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =     7.99 min.
Rainfall intensity =      3.662(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      4.449(CFS) for    2.700(Ac.)
Total runoff =     28.230(CFS)  Total area =       10.30(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     8002.000 to Point/Station     8002.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =     7.99 min.
Rainfall intensity =      3.662(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.824(CFS) for    0.500(Ac.)
Total runoff =     29.054(CFS)  Total area =       10.80(Ac.)
End of computations, total study area =         10.800 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/30/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 9000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9000.000 to Point/Station     9001.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   90.000(Ft.)
Highest elevation =  802.000(Ft.)
Lowest elevation =  799.000(Ft.)
Elevation difference =    3.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.86 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  90.000^.5)/(   3.333^(1/3)]=   2.86
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      1.492(CFS)
Total initial stream area =        0.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9001.000 to Point/Station     9002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =   799.000(Ft.)
Downstream point elevation =   764.000(Ft.)
Channel length thru subarea  =   560.000(Ft.)
```



```
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =     12.945(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     12.945(CFS)
Depth of flow =   0.208(Ft.), Average velocity =   6.777(Ft/s)
Channel flow top width =   13.335(Ft.)
Flow Velocity =    6.78(Ft/s)
Travel time  =    1.38 min.
Time of concentration =    6.38 min.
Critical depth =      0.375(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.985(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     20.799(CFS) for    6.140(Ac.)
Total runoff =     22.292(CFS)  Total area =        6.54(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9002.000 to Point/Station     9003.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =   764.000(Ft.)
Downstream point/station elevation =   735.000(Ft.)
Pipe length  =   210.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =    22.292(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    22.292(CFS)
Normal flow depth in pipe =   10.66(In.)
Flow top width inside pipe =   17.69(In.)
Critical depth could not be calculated.
Pipe flow velocity =     20.44(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     6.55 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9003.000 to Point/Station     9003.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =     6.55 min.
Rainfall intensity =      3.945(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.746(CFS) for    0.420(Ac.)
Total runoff =     23.037(CFS)  Total area =        6.96(Ac.)
End of computations, total study area =          6.960 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 10/23/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 9500 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9003.000 to Point/Station     9003.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
--------------------------------------------------------------------------
User specified 'C' value of 0.830 given for subarea
Rainfall intensity (I) =      2.001(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  32.55 min.  Rain intensity =       2.00(In/Hr)
Total area =        6.960(Ac.)  Total runoff =     3.300(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9003.000 to Point/Station     9004.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
--------------------------------------------------------------------------
Upstream point/station elevation =   732.000(Ft.)
Downstream point/station elevation =   730.000(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =     3.300(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.300(CFS)
Normal flow depth in pipe =    7.79(In.)
Flow top width inside pipe =   11.45(In.)
Critical Depth =    9.33(In.)
Pipe flow velocity =      6.11(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    32.82 min.
```



```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9003.000 to Point/Station     9004.000
**** CONFLUENCE OF MINOR STREAMS ****
--------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      6.960(Ac.)
Runoff from this stream =      3.300(CFS)
Time of concentration =   32.82 min.
Rainfall intensity =     1.991(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9005.000 to Point/Station     9006.000
**** INITIAL AREA EVALUATION ****
--------------------------------------------------------------------------
User specified 'C' value of 0.450 given for subarea
Initial subarea flow distance  =   55.000(Ft.)
Highest elevation =  762.000(Ft.)
Lowest elevation =  758.000(Ft.)
Elevation difference =    4.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     4.48 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  55.000^.5)/(   7.273^(1/3)]=   4.48
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.217(CFS)
Total initial stream area =       0.110(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     9006.000 to Point/Station     9004.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
Upstream point elevation =   758.000(Ft.)
Downstream point elevation =   733.000(Ft.)
Channel length thru subarea  =   430.000(Ft.)
Channel base width       =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      2.933(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      2.933(CFS)
Depth of flow =   0.142(Ft.), Average velocity =   2.641(Ft/s)
Channel flow top width =   10.669(Ft.)
Flow Velocity =    2.64(Ft/s)
Travel time  =    2.71 min.
Time of concentration =    7.71 min.
Critical depth =      0.174(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.450 given for subarea
Rainfall intensity =      3.709(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      4.590(CFS) for    2.750(Ac.)
Total runoff =      4.808(CFS)  Total area =       2.86(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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```
Process from Point/Station     9006.000 to Point/Station     9004.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.860(Ac.)
Runoff from this stream =      4.808(CFS)
Time of concentration =    7.71 min.
Rainfall intensity =     3.709(In/Hr)
Summary of stream data:

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


1         3.300      32.82                 1.991
2         4.808       7.71                 3.709
Qmax(1) =
            1.000 *    1.000 *     3.300) +
            0.537 *    1.000 *     4.808) + =       5.881
Qmax(2) =
            1.000 *    0.235 *     3.300) +
            1.000 *    1.000 *     4.808) + =       5.583

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.300        4.808
Maximum flow rates at confluence using above data:
       5.881        5.583
Area of streams before confluence:
       6.960        2.860
Results of confluence:
Total flow rate =      5.881(CFS)
Time of concentration =    32.823 min.
Effective stream area after confluence =      9.820(Ac.)
End of computations, total study area =          9.820 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/27/19
------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 11000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    10000.000 to Point/Station    10001.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   95.000(Ft.)
Highest elevation =  767.000(Ft.)
Lowest elevation =  758.000(Ft.)
Elevation difference =    9.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.07 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  95.000^.5)/(   9.474^(1/3)]=   2.07
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.522(CFS)
Total initial stream area =        0.140(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    10001.000 to Point/Station    10002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =   758.000(Ft.)
Downstream point elevation =   650.000(Ft.)
Channel length thru subarea  =  1975.000(Ft.)
```



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Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =     22.328(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    3.000(Ft.)
Flow(q) thru subarea =     22.328(CFS)
Depth of flow =   0.281(Ft.), Average velocity =   7.483(Ft/s)
Channel flow top width =   16.239(Ft.)
Flow Velocity =    7.48(Ft/s)
Travel time  =    4.40 min.
Time of concentration =    9.40 min.
Critical depth =      0.492(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.451(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     34.288(CFS) for   11.690(Ac.)
Total runoff =     34.810(CFS)  Total area =       11.83(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    10003.000 to Point/Station    10002.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =     9.40 min.
Rainfall intensity =      3.451(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      1.630(CFS) for    1.050(Ac.)
Total runoff =     36.441(CFS)  Total area =       12.88(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    10002.000 to Point/Station    10002.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
User specified 'C' value of 0.450 given for subarea
Time of concentration =     9.40 min.
Rainfall intensity =      3.451(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.901(CFS) for    0.580(Ac.)
Total runoff =     37.341(CFS)  Total area =       13.46(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    10004.000 to Point/Station    10002.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =     9.40 min.
Rainfall intensity =      3.451(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      2.283(CFS) for    1.470(Ac.)
```

```
Total runoff =     39.624(CFS)  Total area =      14.93(Ac.)
End of computations, total study area =         14.930 (Ac.)
```

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                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 13000 - PROPOSED CONDITIONS
100-YEAR STORM EVENT


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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    13000.000 to Point/Station    13001.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   81.000(Ft.)
Highest elevation =  586.000(Ft.)
Lowest elevation =  578.600(Ft.)
Elevation difference =    7.400(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     5.04 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  81.000^.5)/( 9.136^(1/3)]=   5.04
Rainfall intensity (I) =      4.376(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.374(CFS)
Total initial stream area =        0.190(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    13001.000 to Point/Station    13002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
```



```
Upstream point elevation =   578.600(Ft.)
Downstream point elevation =   577.000(Ft.)
Channel length thru subarea  =   143.000(Ft.)
Channel base width       =     5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      1.437(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =     2.000(Ft.)
Flow(q) thru subarea =      1.437(CFS)
Depth of flow =   0.145(Ft.), Average velocity =   1.146(Ft/s)
Channel flow top width =   12.267(Ft.)
Flow Velocity =    1.15(Ft/s)
Travel time  =    2.08 min.
Time of concentration =    7.12 min.
Critical depth =      0.112(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.822(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      1.858(CFS) for    1.080(Ac.)
Total runoff =     2.232(CFS)  Total area =        1.27(Ac.)
End of computations, total study area =          1.270 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 15000 - PROPOSED CONDITIONS
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    15000.000 to Point/Station    15001.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   77.000(Ft.)
Highest elevation =  647.000(Ft.)
Lowest elevation =  644.400(Ft.)
Elevation difference =    2.600(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     6.84 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  77.000^.5)/( 3.377^(1/3)]=   6.84
Rainfall intensity (I) =      3.879(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.419(CFS)
Total initial stream area =       0.240(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    15001.000 to Point/Station    15002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
_____________________________________________________________________________
```



```
Upstream point elevation =   644.400(Ft.)
Downstream point elevation =   620.000(Ft.)
Channel length thru subarea  =   480.000(Ft.)
Channel base width       =     5.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      3.072(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      3.072(CFS)
Depth of flow =   0.146(Ft.), Average velocity =   2.444(Ft/s)
Channel flow top width =   12.277(Ft.)
Flow Velocity =    2.44(Ft/s)
Travel time  =    3.27 min.
Time of concentration =   10.12 min.
Critical depth =      0.170(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.360(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      4.596(CFS) for    3.040(Ac.)
Total runoff =      5.015(CFS)  Total area =        3.28(Ac.)
End of computations, total study area =          3.280 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/17/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 16000
PROPOSED CONDITION
100-YEAR STORM EVENT
--------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    16000.000 to Point/Station    16001.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   75.000(Ft.)
Highest elevation =  666.000(Ft.)
Lowest elevation =  664.000(Ft.)
Elevation difference =    2.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.81 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  75.000^.5)/(   2.667^(1/3)]=   2.81
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.746(CFS)
Total initial stream area =        0.200(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    16001.000 to Point/Station    16002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
____________________________________________________________________________
Upstream point elevation =   664.000(Ft.)
Downstream point elevation =   635.000(Ft.)
Channel length thru subarea  =   800.000(Ft.)
Channel base width      =    5.000(Ft.)
```



```
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =     10.577(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     10.577(CFS)
Depth of flow =   0.216(Ft.), Average velocity =   5.262(Ft/s)
Channel flow top width =   13.631(Ft.)
Flow Velocity =    5.26(Ft/s)
Travel time  =    2.53 min.
Time of concentration =    7.53 min.
Critical depth =      0.340(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.742(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     16.762(CFS) for    5.270(Ac.)
Total runoff =     17.508(CFS)  Total area =        5.47(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    16002.000 to Point/Station    16002.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =     7.53 min.
Rainfall intensity =      3.742(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.455(CFS) for    0.270(Ac.)
Total runoff =     17.963(CFS)  Total area =        5.74(Ac.)
End of computations, total study area =          5.740 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 04/02/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 17000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17000.000 to Point/Station    17001.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   60.000(Ft.)
Highest elevation =  702.000(Ft.)
Lowest elevation =  701.500(Ft.)
Elevation difference =    0.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.70 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  60.000^.5)/(   0.833^(1/3)]=   3.70
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.448(CFS)
Total initial stream area =        0.120(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17001.000 to Point/Station    17002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
__________________________________________________________________________
Upstream point elevation =   701.500(Ft.)
Downstream point elevation =   690.000(Ft.)
Channel length thru subarea  =   920.000(Ft.)
```



```
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      9.868(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      9.868(CFS)
Depth of flow =   0.271(Ft.), Average velocity =   3.503(Ft/s)
Channel flow top width =   15.822(Ft.)
Flow Velocity =    3.50(Ft/s)
Travel time  =    4.38 min.
Time of concentration =    9.38 min.
Critical depth =      0.328(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.454(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     14.825(CFS) for    5.050(Ac.)
Total runoff =     15.272(CFS)  Total area =        5.17(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17002.000 to Point/Station    17002.000
**** SUBAREA FLOW ADDITION ****
__________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Time of concentration =     9.38 min.
Rainfall intensity =      3.454(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.606(CFS) for    0.390(Ac.)
Total runoff =     15.878(CFS)  Total area =        5.56(Ac.)
End of computations, total study area =          5.560 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 01/28/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 17500 - PROPOSED CONDITIONS
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)   =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17500.000 to Point/Station    17501.000
**** 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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Initial subarea flow distance  =   90.000(Ft.)
Highest elevation =  696.000(Ft.)
Lowest elevation =  692.000(Ft.)
Elevation difference =    4.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     6.75 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  90.000^.5)/( 4.444^(1/3)]=   6.75
Rainfall intensity (I) =      3.899(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.281(CFS)
Total initial stream area =        0.160(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17501.000 to Point/Station    17502.000
**** IMPROVED CHANNEL TRAVEL TIME ****
--------------------------------------------------------------------------
```



```
Upstream point elevation =   692.000(Ft.)
Downstream point elevation =   691.300(Ft.)
Channel length thru subarea  =    68.000(Ft.)
Channel base width       =    4.000(Ft.)
Slope or 'Z' of left channel bank =  25.000
Slope or 'Z' of right channel bank =  25.000
Estimated mean flow rate at midpoint of channel =      0.518(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      0.518(CFS)
Depth of flow =   0.095(Ft.), Average velocity =   0.849(Ft/s)
Channel flow top width =    8.773(Ft.)
Flow Velocity =    0.85(Ft/s)
Travel time  =    1.33 min.
Time of concentration =    8.09 min.
Critical depth =      0.069(Ft.)
 Adding area flow to channel
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
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      3.645(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.443(CFS) for    0.270(Ac.)
Total runoff =     0.724(CFS)  Total area =        0.43(Ac.)
End of computations, total study area =          0.430 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/30/19
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 18000 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18000.000 to Point/Station    18001.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   90.000(Ft.)
Highest elevation =  802.000(Ft.)
Lowest elevation =  799.000(Ft.)
Elevation difference =    3.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.86 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  90.000^.5)/(   3.333^(1/3)]=   2.86
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      1.492(CFS)
Total initial stream area =        0.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18001.000 to Point/Station    18002.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =   799.000(Ft.)
Downstream point elevation =   795.000(Ft.)
Channel length thru subarea  =   410.000(Ft.)
```



```
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  20.000
Slope or 'Z' of right channel bank =  20.000
Estimated mean flow rate at midpoint of channel =      9.103(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      9.103(CFS)
Depth of flow =   0.276(Ft.), Average velocity =   3.131(Ft/s)
Channel flow top width =   16.050(Ft.)
Flow Velocity =    3.13(Ft/s)
Travel time  =    2.18 min.
Time of concentration =    7.18 min.
Critical depth =      0.316(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.809(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =     13.211(CFS) for    4.080(Ac.)
Total runoff =     14.703(CFS)  Total area =        4.48(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18002.000 to Point/Station    18002.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
User specified 'C' value of 0.450 given for subarea
Time of concentration =     7.18 min.
Rainfall intensity =      3.809(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      0.411(CFS) for    0.240(Ac.)
Total runoff =     15.114(CFS)  Total area =        4.72(Ac.)
End of computations, total study area =          4.720 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2003 Version 6.3

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 04/02/20
--------------------------------------------------------------------------
CARMEL MOUNTAIN RANCH
SYSTEM 18500 - PROPOSED CONDITION
100-YEAR STORM EVENT


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

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


Program License Serial Number 4049

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

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18002.000 to Point/Station    18002.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
__________________________________________________________________________
User specified 'C' value of 0.830 given for subarea
Rainfall intensity (I) =      2.133(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  29.20 min.  Rain intensity =       2.13(In/Hr)
Total area =        4.720(Ac.)  Total runoff =     2.000(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18002.000 to Point/Station    18003.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
__________________________________________________________________________
Upstream point/station elevation =   789.000(Ft.)
Downstream point/station elevation =   672.580(Ft.)
Pipe length  =  1085.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =     2.000(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.000(CFS)
Normal flow depth in pipe =    4.10(In.)
Flow top width inside pipe =    8.96(In.)
Critical Depth =    7.71(In.)
Pipe flow velocity =     10.20(Ft/s)
Travel time through pipe =    1.77 min.
Time of concentration (TC) =    30.97 min.
```



```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18003.000 to Point/Station    18003.000
**** CONFLUENCE OF MINOR STREAMS ****
__________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      4.720(Ac.)
Runoff from this stream =      2.000(CFS)
Time of concentration =   30.97 min.
Rainfall intensity =     2.062(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18004.000 to Point/Station    18005.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________________
User specified 'C' value of 0.450 given for subarea
Initial subarea flow distance  =   85.000(Ft.)
Highest elevation =  794.000(Ft.)
Lowest elevation =  772.000(Ft.)
Elevation difference =   22.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.65 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4500)*(  85.000^.5)/(  25.882^(1/3)]=   3.65
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      0.178(CFS)
Total initial stream area =        0.090(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    18005.000 to Point/Station    18003.000
**** IMPROVED CHANNEL TRAVEL TIME ****
__________________________________________________________________________
Upstream point elevation =   772.000(Ft.)
Downstream point elevation =   679.000(Ft.)
Channel length thru subarea  =   900.000(Ft.)
Channel base width      =    4.560(Ft.)
Slope or 'Z' of left channel bank =   0.000
Slope or 'Z' of right channel bank =   0.000
Estimated mean flow rate at midpoint of channel =      4.681(CFS)
Manning's 'N'    = 0.005
Maximum depth of channel  =    0.100(Ft.)
Flow(q) thru subarea =      4.681(CFS)
Depth of flow =   0.067(Ft.), Average velocity =  15.404(Ft/s)
Channel flow top width =    4.560(Ft.)
Flow Velocity =   15.40(Ft/s)
Travel time  =    0.97 min.
Time of concentration =    5.97 min.
Critical depth =      0.320(Ft.)
 Adding area flow to channel
User specified 'C' value of 0.450 given for subarea
Rainfall intensity =      4.088(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      8.388(CFS) for    4.560(Ac.)
Total runoff =      8.566(CFS)  Total area =        4.65(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station    18005.000 to Point/Station    18003.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.650(Ac.)
Runoff from this stream =      8.566(CFS)
Time of concentration =    5.97 min.
Rainfall intensity =     4.088(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17002.000 to Point/Station    17002.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
____________________________________________________________________________
User specified 'C' value of 0.830 given for subarea
Rainfall intensity (I) =      2.675(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  18.40 min.  Rain intensity =       2.68(In/Hr)
Total area =        5.560(Ac.)  Total runoff =     2.600(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17002.000 to Point/Station    18003.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   672.580(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =     2.600(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.600(CFS)
Normal flow depth in pipe =    6.29(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    8.30(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    18.67 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station    17002.000 to Point/Station    18003.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      5.560(Ac.)
Runoff from this stream =      2.600(CFS)
Time of concentration =   18.67 min.
Rainfall intensity =     2.659(In/Hr)
Summary of stream data:

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


1        2.000     30.97                2.062
2        8.566      5.97                4.088
3        2.600     18.67                2.659
Qmax(1) =
           1.000 *    1.000 *     2.000) +
           0.504 *    1.000 *     8.566) +
           0.775 *    1.000 *     2.600) + =       8.336
Qmax(2) =
```

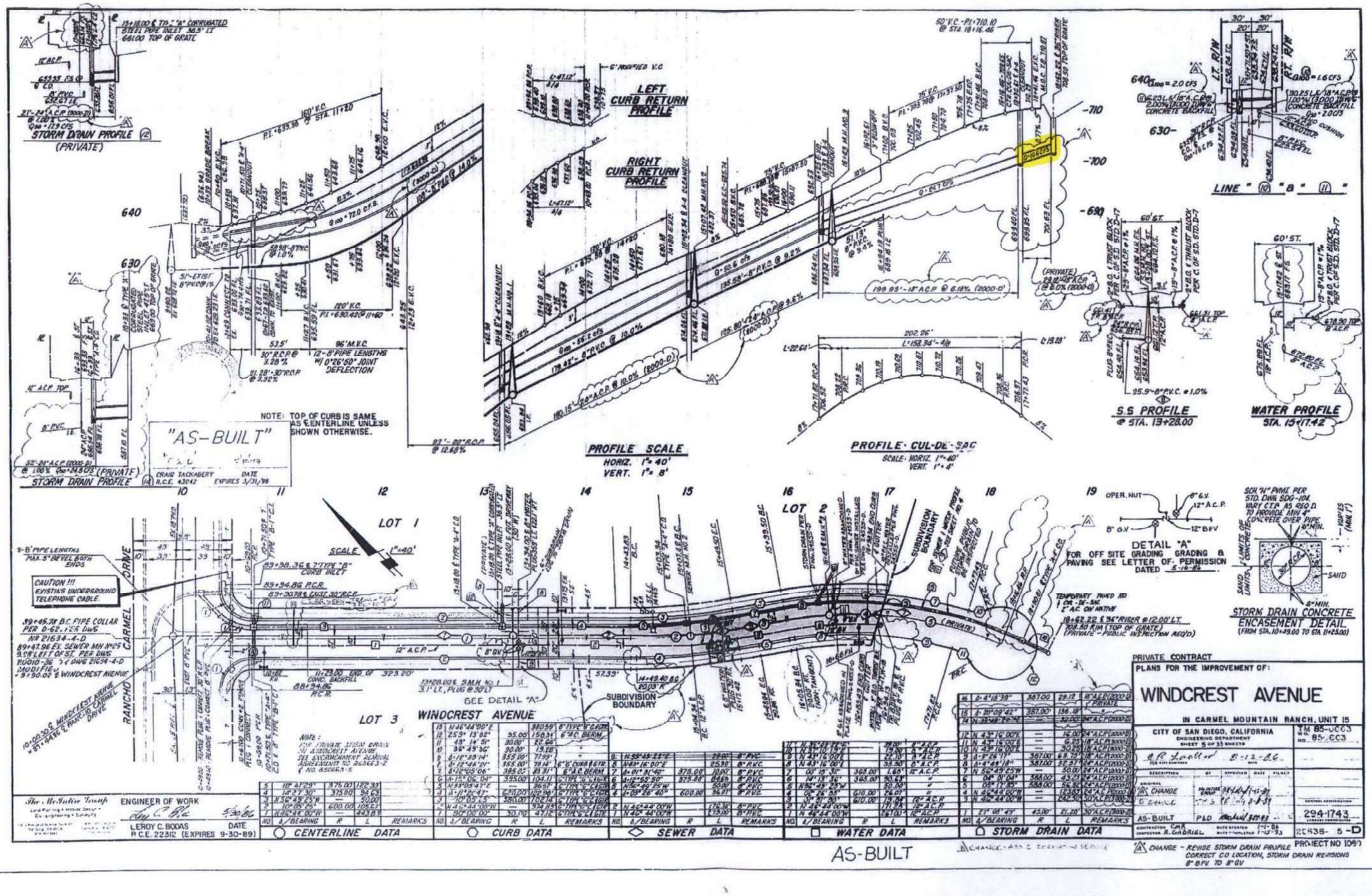


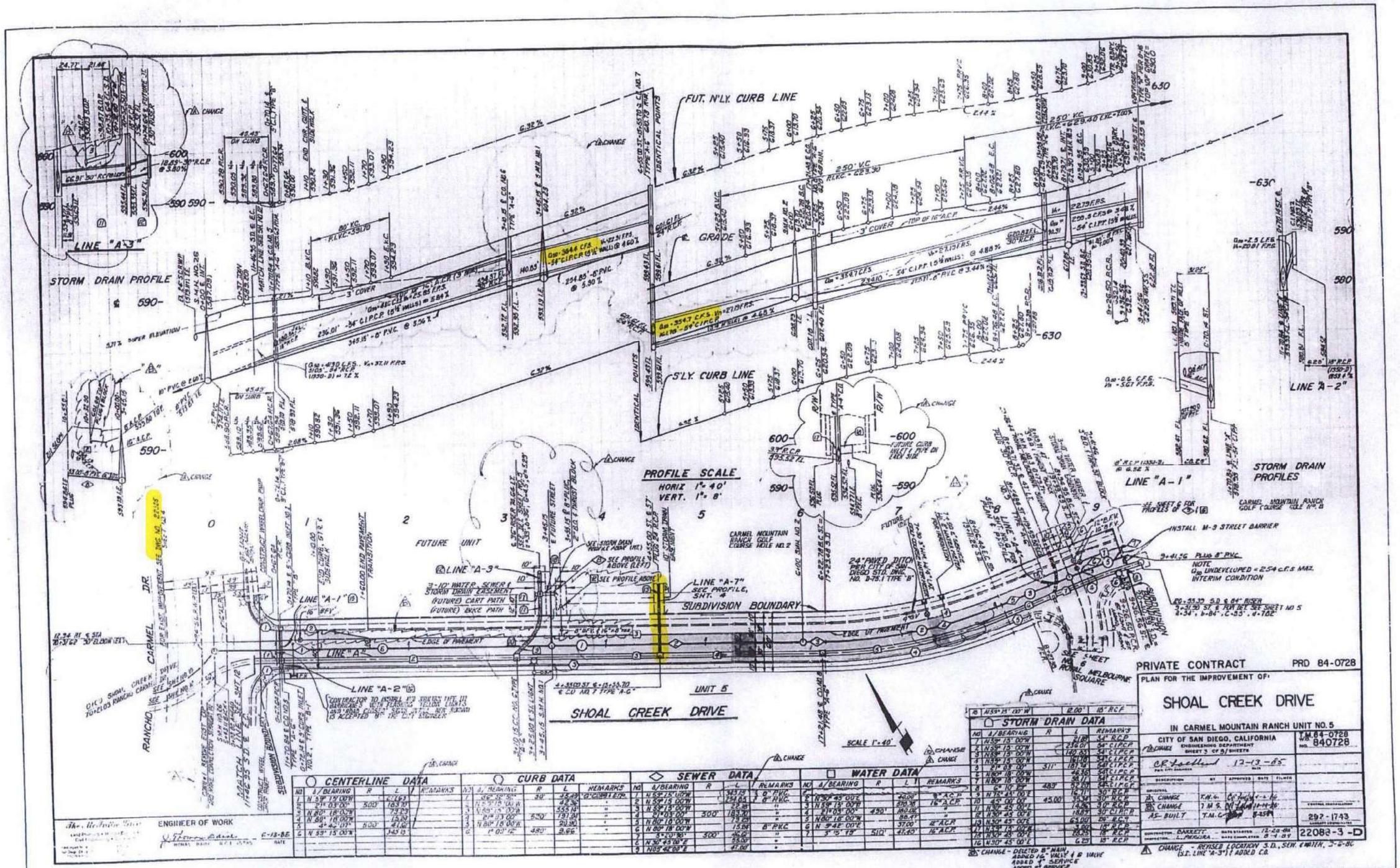
```
           1.000 *    0.193 *     2.000) +
           1.000 *    1.000 *     8.566) +
           1.000 *    0.320 *     2.600) + =       9.783
Qmax(3) =
           1.000 *    0.603 *     2.000) +
           0.650 *    1.000 *     8.566) +
           1.000 *    1.000 *     2.600) + =       9.377

Total of 3 streams to confluence:
Flow rates before confluence point:
       2.000       8.566       2.600
Maximum flow rates at confluence using above data:
       8.336       9.783       9.377
Area of streams before confluence:
       4.720       4.650       5.560
Results of confluence:
Total flow rate =      9.783(CFS)
Time of concentration =     5.974 min.
Effective stream area after confluence =     14.930(Ac.)
End of computations, total study area =          14.930 (Ac.)
```

APPENDIX 4

Backbone Study As-Built Record Drawings


STORM DRAIN PROFILE (PRIVATE)
LEFT CURB RETURN PROFILE
RIGHT CURB RETURN PROFILE
PROFILE SCALE
HORIZ. 1"=40'
VERT. 1"=8'
PROFILE - CUL-DE-SAC
SCALE: HORIZ. 1"=40'
VERT. 1"=4'
"AS-BUILT"
NOTE: TOP OF CURB IS SAME AS ℄ENTERLINE UNLESS SHOWN OTHERWISE.
CRAIG TACKABERY R.C.E. 43042 DATE EXPIRES 3/31/96
STORM DRAIN PROFILE
SCALE 1"=40'
LOT 1
LOT 2
LOT 3
SUBDIVISION BOUNDARY
WINDCREST AVENUE
RANCHO CARMEL DRIVE
CAUTION !!! EXISTING UNDERGROUND TELEPHONE CABLE.
SEE DETAIL "A"
DETAIL "A"
FOR OFF SITE GRADING GRADING & PAVING SEE LETTER OF PERMISSION DATED 5-16-85
S.S PROFILE @ STA. 13+28.00
WATER PROFILE STA. 15+17.42
LINE "10" "a" "11"
STORM DRAIN CONCRETE ENCASEMENT DETAIL
(FROM STA. 10+49.00 TO STA 11+23.00)
PRIVATE CONTRACT
PLANS FOR THE IMPROVEMENT OF:
WINDCREST AVENUE
IN CARMEL MOUNTAIN RANCH, UNIT 15
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 5 OF 33 SHEETS
TM 85-0663
MAP NO. 85-0C3
294-1743
22938-5-D
PROJECT NO 1080
AS-BUILT
CHANGE - REVISE STORM DRAIN PROFILE CORRECT CO LOCATION, STORM DRAIN REVISIONS 8" BFV TO 8" GV
ENGINEER OF WORK
LEROY C. BODAS
R.C.E. 22312 (EXPIRES 9-30-89)
DATE
CENTERLINE DATA
CURB DATA
SEWER DATA
WATER DATA
STORM DRAIN DATA



CENTERLINE DATA

NO	Δ/BEARING	R	L	REMARKS
1	N 59° 15' 00"W		42.43	
2	21° 03' 00"	500'	183.77	
3	N 80° 18' 00"W		73.23	
4	N 59° 15' 00"W	500'	151.34	
5	4° 44' 07"	500'	41.40	
6	N 53° 15' 00"W		345.13	

CURB DATA

NO	Δ/BEARING	R	L	REMARKS
1	90° 00' 00"	30'	47.12	(2'-CURB) EITH.
2	N 59° 15' 00"W		42.43	"
3	21° 03' 00"	500'	183.77	"
4	N 80° 18' 00"W		73.23	"
5	4° 44' 07"	500'	41.40	"
6	N 53° 15' 00"W		345.13	"
7	1° 03' 12"	480'	8.82	"

SEWER DATA

NO	Δ/BEARING	R	L	REMARKS
1	N 59° 15' 00"W		143.28	8" P.V.C.
2	N 59° 15' 00"W		294.84	8" P.V.C.
3	N 59° 15' 00"W		22.98	"
4	21° 03' 00"	300'	183.70	"
5	N 80° 18' 00"W		73.23	"
6	N 80° 18' 00"W		151.34	8" P.V.C.
7	3° 20' 30"	500'	46.82	"
8	N 30° 45' 00"E		55.00	"
9	N 09° 42' 08"E		47.00	"

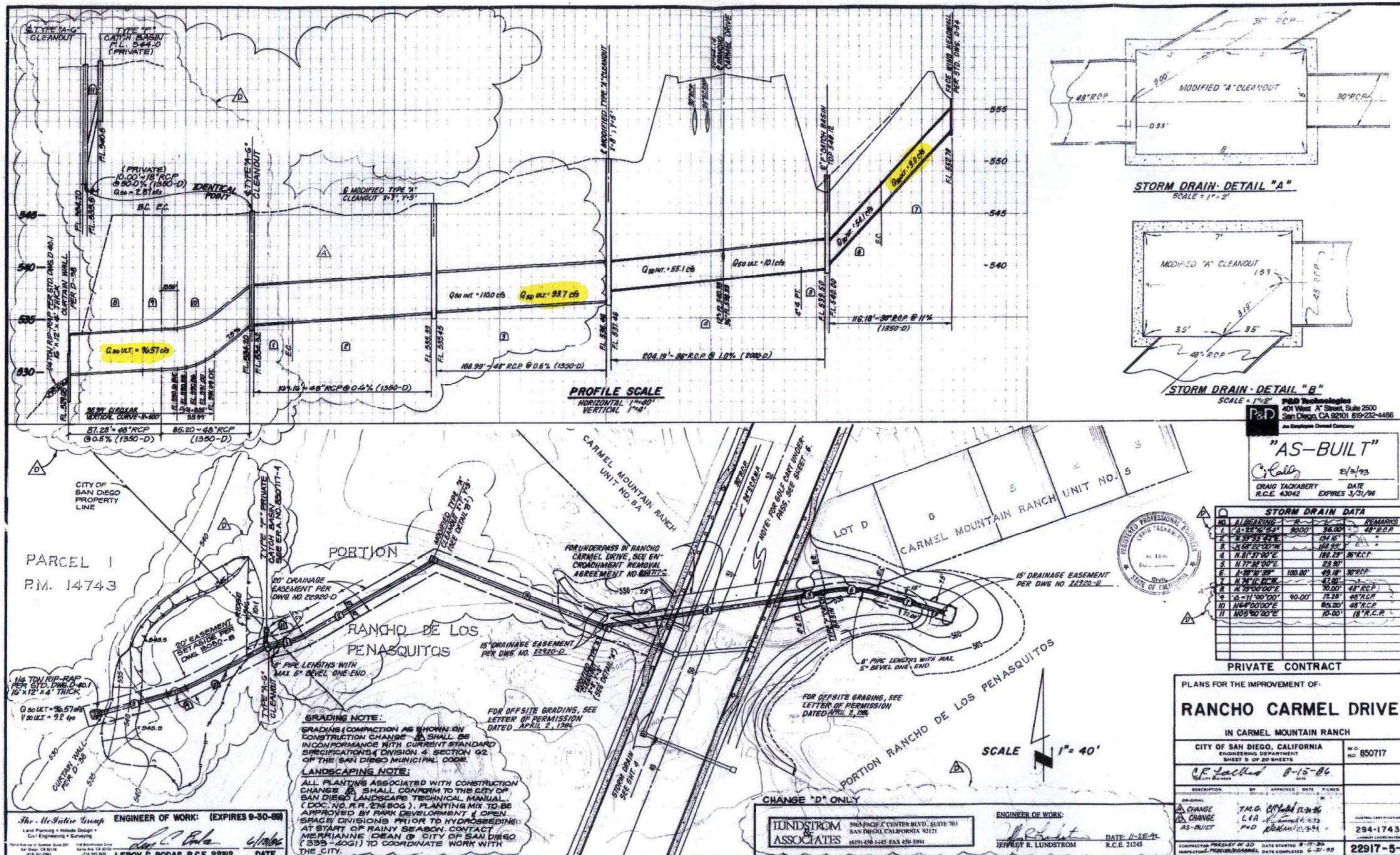
WATER DATA

NO	Δ/BEARING	R	L	REMARKS
1			42.00'	8" R.C.P.
2	N 30° 45' 00"E		110.00'	16" A.C.P.
3	N 59° 15' 00"W		870.38	"
4	21° 03' 00"	450'	165.32	"
5	N 80° 18' 00"W		86.47	"
6	N 9° 42' 00"E		37.00'	12" A.C.P.
7	3° 15' 19"	510'	41.45'	16" A.C.P.

STORM DRAIN DATA

NO	Δ/BEARING	R	L	REMARKS
1	N 59° 15' 00"W		21.80'	54" R.C.P.
2	N 59° 15' 00"W		236.01'	54" C.I.P.C.P.
3	N 59° 15' 00"W		140.80'	54" C.I.P.C.P.
4	N 59° 15' 00"W		161.00'	54" C.I.P.C.P.
5	PI 03° 00"W	311'	181.30'	54" C.I.P.C.P.
6	N 80° 18' 00"W		46.36'	54" C.I.P.C.P.
7	N 80° 18' 00"W		96.10'	54" C.I.P.C.P.
8	6° 10' 24"	489'	52.80'	54" C.I.P.C.P.
9	N 74° 21' 00"E		16.41'	30" R.C.P.
10	45° 00' 00"	45.00'	35.34'	30" R.C.P.
11	N 30° 45' 00"E		14.00'	30" R.C.P.
12	N 30° 45' 00"E		18.81'	30" C.I.P.C.P.
13	N 30° 45' 00"E		63.00'	24" R.C.P.
14	N 74° 21' 00"E		3.00'	18" R.C.P.
15	N 30° 45' 00"E		28.05'	18" R.C.P.
16	N 30° 45' 00"E		6.25'	15" R.C.P.

CHANGE - REVISED LOCATION S.D., SEW. & WATER, 5-6-86
CHANGE - DELETED 8" MAIN ADDED 12" - VALVE & 8" VALVE ADDED 1" SERVICE ADDED 2" SERVICE



GRADING NOTE:

GRADING & COMPACTION AS SHOWN ON CONSTRUCTION CHANGE (B) SHALL BE IN CONFORMANCE WITH CURRENT STANDARD SPECIFICATIONS & DIVISION 4 SECTION 62 OF THE SAN DIEGO MUNICIPAL CODE.

LANDSCAPING NOTE:

ALL PLANTING ASSOCIATED WITH CONSTRUCTION CHANGE (B) SHALL CONFORM TO THE CITY OF SAN DIEGO LANDSCAPE TECHNICAL MANUAL. (DOC. NO. R.R. 274806). PLANTING MIX TO BE APPROVED BY PARK DEVELOPMENT & OPEN SPACE DIVISIONS PRIOR TO HYDROSEEDING AT START OF RAINY SEASON. CONTACT MERRIANNE DEAN @ CITY OF SAN DIEGO (533-4061) TO COORDINATE WORK WITH THE CITY.

STORM DRAIN DATA

NO.	Δ/BEARING	R	L	REMARKS
1.	Δ-22°16'54"	90.00'	36.00'	48" R.C.P.
2.	N.39°33'42"E.		134.16'	"
3.	N.68°22'00"W.		168.99'	"
4.	N.81°31'00"E.		180.29'	36" R.C.P.
5.	N.77°38'00"E.		23.90'	
6.	Δ-28°10'39"	100.00'	49.18'	30" RCP
7.	N.74°11'27"W.		67.00'	"
8.	N.75°00'00"E.		70.00'	48" RCP
9.	Δ-11°00'00"	90.00'	17.28'	48" RCP
10	N64°00'00"E		85.20'	48" R.C.P.
11	N05°00'00"E		10.00'	18" R.C.P.

PRIVATE CONTRACT

PLANS FOR THE IMPROVEMENT OF:

RANCHO CARMEL DRIVE

IN CARMEL MOUNTAIN RANCH

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 5 OF 20 SHEETS

W.O. NO. 850717

8-15-86

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
(A) CHANGE	T.M.G.		12-30-86	
(D) CHANGE	L&A			
AS-BUILT	P&D			

CONTRACTOR PRESLEY OF SD — DATE STARTED 8-15-86
INSPECTOR — DATE COMPLETED 6-21-93

294-1743

22917-5-D

J.N.1088

The McIntire Group — Land Planning • Hillside Design • Civil Engineering • Surveying

ENGINEER OF WORK: (EXPIRES 9-30-89)
LEROY C. BODAS, R.C.E. 22312 — DATE 6/13/86

LUNDSTROM & ASSOCIATES — 5965 PACIFIC CENTER BLVD., SUITE 703, SAN DIEGO, CALIFORNIA 92121 (619) 450-1445 FAX 450-1094

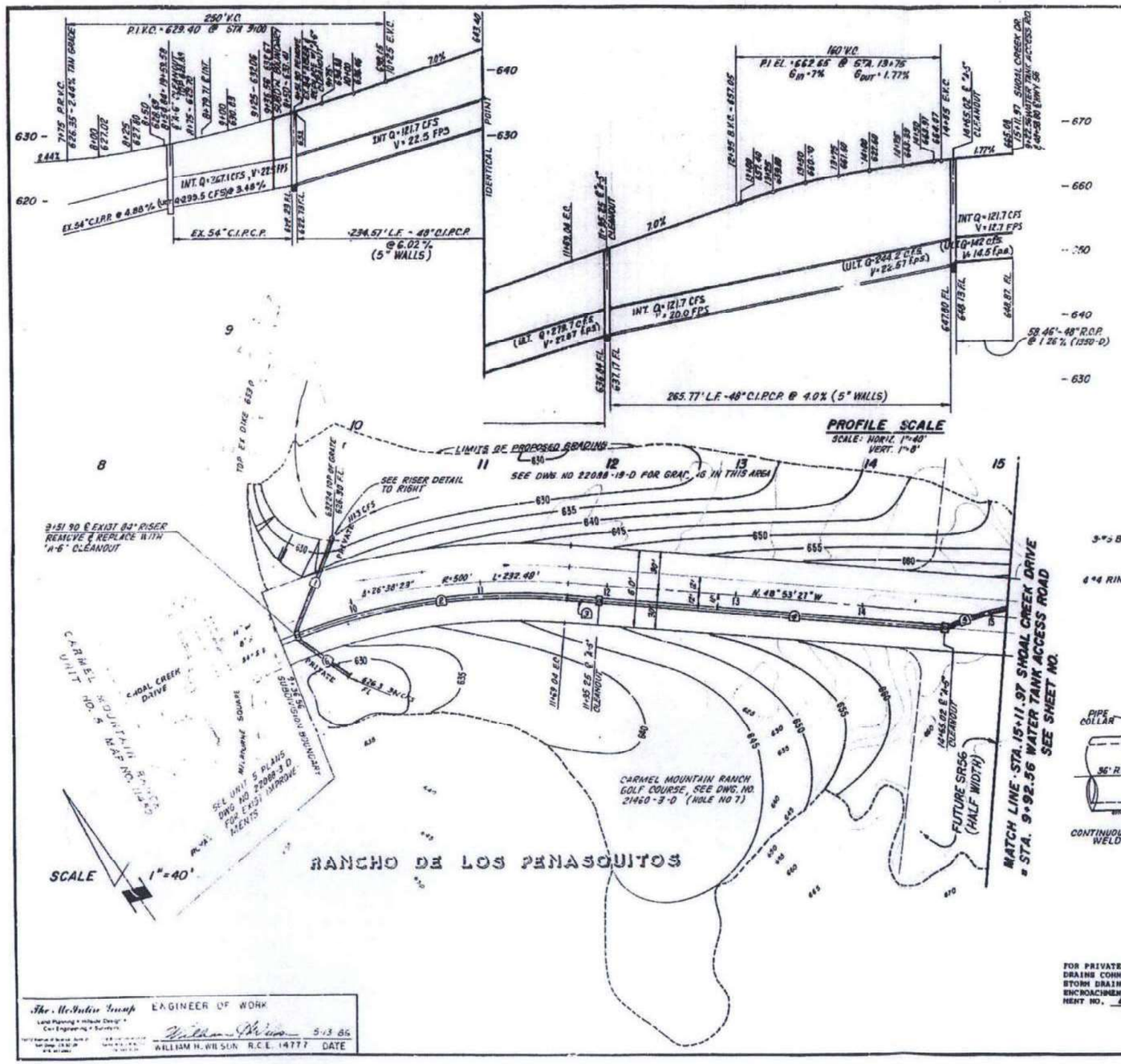
ENGINEER OF WORK:
JEFFREY R. LUNDSTROM R.C.E. 21245 — DATE: 11-25-92

AS-BUILT

(D) REMOVE DESILTING BASIN AND CONNECT STORM DRAIN, ADD ENGR LOGO.

(A) MOVED STORM DRAIN, HEADWALL & CLEANOUT LOCATIONS & ADD DETAILS TO PROFILE.

0 1 2 3 4IN.



STORM DRAIN DATA				
NO	Δ / BEARING	R	L	REMARKS
1	N 09°17'09"E		88'±	36" R.C.P.
2	N 24°30'54"	489.00'	210.37	48" R.C.P.C.P.
3	N 48°53'21"W		64.51'	"
4	N 48°53'21"W		236.99	"
5	N 41°06'39"	200.00'	53.46	48" R.C.P.
6	N 17°41'25"W		90'±	24" R.C.P.

FOR PRIVATE TEMPORARY STORM DRAINS CONNECTING TO PUBLIC STORM DRAIN SYSTEM, SEE ENCROACHMENT REMOVAL AGREEMENT NO. 840728-7

The McIntire Group — ENGINEER OF WORK
William H. Wilson 5-13-86
WILLIAM H. WILSON R.C.E. 14777 DATE

PRIVATE CONTRACT

GRADING PLANS FOR:

ACCESS EASEMENT FOR WATER TANK SITE

IN CARMEL MOUNTAIN RANCH

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 6 SHEETS

W.O. NO. 840728

U.S. Rackley 9-2-86
RECOMMENDED FOR APPROVAL — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
"AS-BUILT"	LAA	[illegible]	7-8-87	

294-1743
LOCATION COORDINATES

CONSTRUCTION: PRESLEY — DATE STARTED: 1986
INSPECTOR: P. MANELA — DATE COMPLETED: 8-19-87

22939-3-D
DRAWING NO.

"AS-BUILT"

NOTE: TOP OF CURB ELEVATIONS ARE 0.04' ABOVE CORRESPONDING POINTS ON ℄ GRADE UNLESS OTHERWISE NOTED.

PROFILE
SCALE: HORIZ. 1"=40' VERT. 1"=8'

NW CURB RETURN PROFILE
BOULTON AVE & MONTFORT CT.
SCALE: HORIZ. 1"=20' VERT. 1"=4'

NE CURB RETURN PROFILE
BOULTON AVE & MONTFORT CT.
SCALE: HORIZ. 1"=20' VERT. 1"=4'

PROFILE 'A' (10+48.57 & 13' R.C.P.)
SHT. G
SCALE: HORIZ. 1"=20' VERT. 1"=4'

BOULTON AVENUE

CURB DATA

NO.	DELTA	RADIUS	LENGTH	REMARKS
1			102.10'	6"H.C.B.
2	Δ=28°25'25"	182'	90.29'	"
3			130.00'	"
4	Δ=4°37'11"	82'	6.61'	"
5			307.63'	"
6			59.40'	"
7			139.91'	"
8			72.28'	"
9			266.62'	"
10			9.51'	"
11	Δ=26°25'28"	218'	100.56'	"
12	Δ=89°11'05"	30'	46.69	"

SEWER DATA

NO.	DELTA	RADIUS	LENGTH	REMARKS
1			150.00'	8" P.V.C.
2	Δ=2°25'28"	200'	92.24'	"
3			130.00'	"
4	Δ=4°37'11"	100'	8.06'	"
5			307.63'	"
6	Δ=11°22'57"	500'	99.33'	"
7	Δ=20°17'24"	500'	177.06'	"
8			10.67'	"

WATER DATA

NO.	DELTA	RADIUS	LENGTH	REMARKS
1			140.00'	12" A.C.P.
2	Δ=26°25'28"	210'	96.85'	"
3			130.00'	"
4	Δ=4°37'11"	110'	8.87'	"
5			307.63'	"
6	Δ=31°09'21"	490'	270.87'	"
7			72.28'	"

STORM DRAIN DATA

NO.	DELTA	RADIUS	LENGTH	REMARKS
1			47.51'	24" R.C.P.
2			50.01'	24" R.C.P.
3	Δ=8°02'02"	180'	88.71'	24" R.C.P.
4			132.00'	24" R.C.P.
5	Δ=4°37'11"	88'	7.10'	24" R.C.P.
6			47.81'	24" R.C.P.
7			162.53'	21" R.C.P.
8	Δ 10°02'22"	512'	89.71	21" R.C.P.
9	Δ=21°11 01"	512'	189.30'	18" R.C.P.
10			10.70	18" R.C.P.

SAMUEL F. SAFINO R.C.E. 13177 CIVIL — STATE OF CALIFORNIA
SAMUEL F. SAFINO RCE 13177

AS-BUILT ADD G.V., DELETE IRRIG METER 5-28-98

PRIVATE CONTRACT

PLANS FOR THE IMPROVEMENT OF:

BOULTON AVENUE
IN CARMEL MOUNTAIN RANCH UNIT 17

CITY OF SAN DIEGO, CALIFORNIA
ENGINEER'S DEPARTMENT
SHEET 5 OF 20 SHEETS

R.E. Zo-8hwd 3-16-88

CHANGE 5810 — AS BUILT 5810

I.M. 88-0376
No. 860376

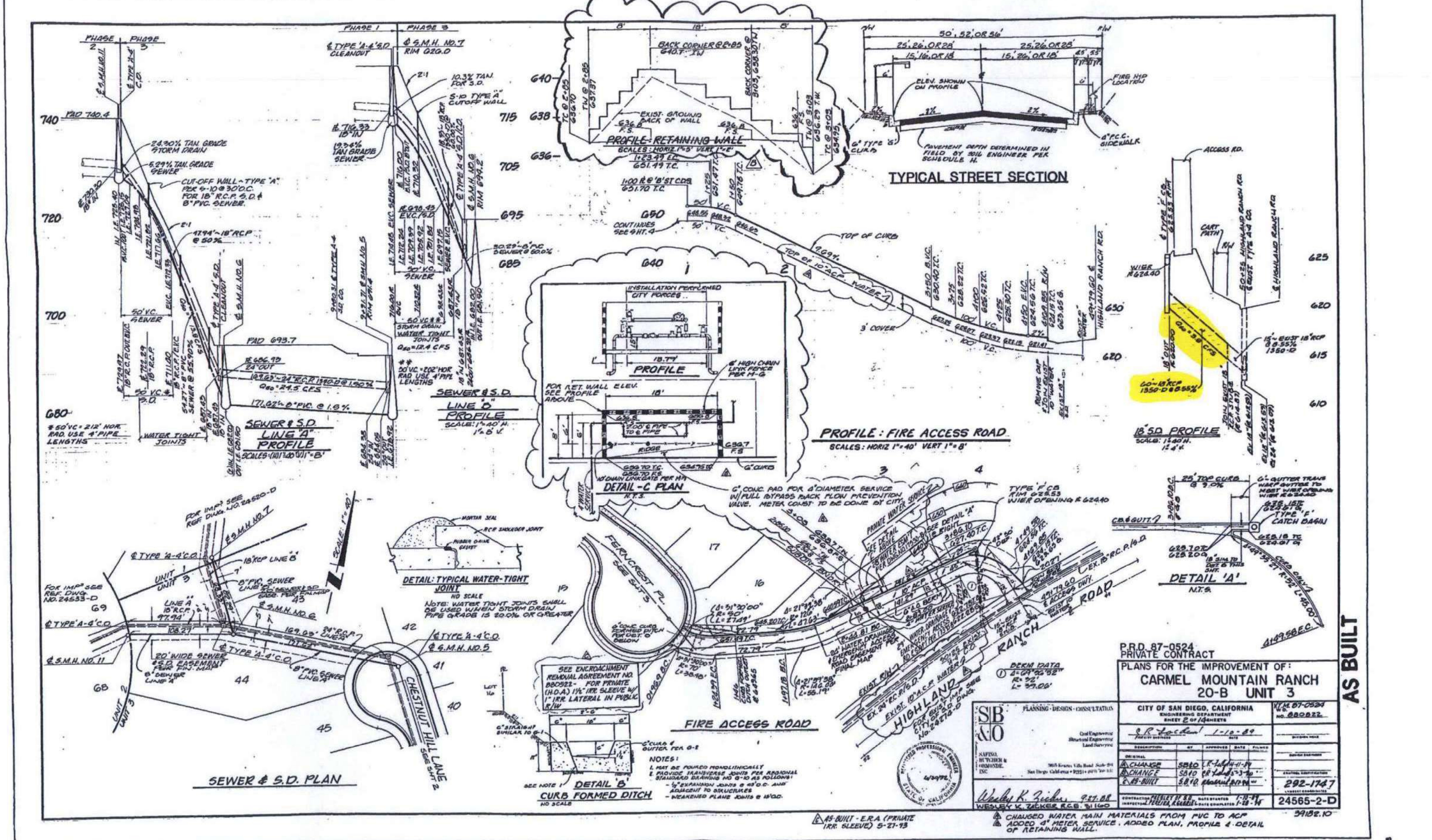
292-1743

25805-5-D

37422.10

CHANGE: ADDED 3' SIDEWALK UNDERDRAIN (FROM 6' WIDE) PER D-27 / ENCROACHMENT NOTE

AS BUILT



5/23/88 7-27-92
7/17/89

WERRIS CREEK LANE

Cb. INLET @ STA. 11+13.83

WERRIS CREEK LANE

Cb IN FT AT STA. 10+83.19

WERRIS CREEK LANE

Cb. INLET AT STA. 10+49.19 (RT)

SCALE: HOR. 1"=20'
VER. 1"=2'

EASTBOURNE ROAD

Cb. INLET AT STA. 22+40.80

WERRIS CREEK LANE

Cb. INLET AT STA. 10+49.19 (LT)

GABLE RIDGE ROAD

Cb. INLET AT STA. 36+36.52

GABLE RIDGE ROAD

Cb. INLET AT STA. 36+08.59

GABLE RIDGE ROAD

Cb. INLET AT STA. 37+06.59

EASTBOURNE ROAD

Cb. INLET AT STA. 22+13.97

Cb. INLET AT STA. 23+14.97

SCALE: HOR. 1"=20'
VER. 1"=4'

F/S & PROFILE 3.393 %

TOP 8"A.C.P. WATER

12"P.V.C. @ 3.1% SAN. SEW.

12"P.V.C. SAN. SEW.

634.±0 F.L.

Qpeak = 486 C.F.S.
Vn = F.R.S.

24+03.09 SAN. MH. 22

34+43.09 B.C.
624.70± F.L.

35+43.41 E.C.
624.30± F.L.

606.56' - 72" C.I.P.C.P. @ 2.12% (7"WALLS)

PROFILE SCALE
HORIZ. 1"=40'
VERT. 1"=4'

37+06.69 E "A" CLEANOUT
635.61 RIM

37+49.09 E "A" CLEANOUT
634.80 RIM, MOD. X=7'; Y=5'

8"P.V.C.
626.70±L.

626.07 F.L.
18" R.C.P.

624.14 F.L.
18" R.C.P.

Qpeak = 196 C.F.S.
Vn =

621.60 F.L.
48" R.C.P.

619.60 F.L.
36" R.C.P.

619.17 F.L.

615.69 F.L.

618.47 F.L.

618.11 F.L.

38.00'-72" C.I.P.C.P.
@ 4.96% (7"WALLS)

622.21 F.L.
18" R.C.P.
SEE SHEET 22
FOR PROFILE

Qpeak = 676 cfs
Vn = 28.2 fps

39+09 INSIDE FACE
WING HEADWALL

TO BE "A" BUILT

40'-58.00 CAYLIGHT JOIN
& NATURAL CHANNEL

0-676 cfs
V= 13.55 fps

FL 612.50

FL 609.99

217.50' - 72" R.C.P. @ 2.76%
(1350-D)

RIP RAP ENERGY DISSIPATOR TO ELEVATION
612.5 MIN PER D-401 TYPE 2 2 TON ROCK
54" THICK MIN & 12" FILTER BLANKET
(10" OF 3" AGGREGATE & 12" SAND)

2300' - 78" R.C.P.
@ 1.68 % (1350-D)

66.0'

49.41'±

39+71.09 8"A-8"
CLEANOUT

MATCH EXIST
CHANNEL

39+96.09 WING
HEADWALL PER
STD D-35

SEE SHEET NO. 20
MATCH LINE STA. 31+00

SCALE: 1"=40'

"AS-BUILT"

BRUCE A. ROBERTSON
R.C.E. 48523

DATE
EXPIRES 6-30-90

AS OF 2-19-87 I AM THE ENGINEER OF RECORD. TO THE BEST OF MY KNOWLEDGE, THIS PLAN SHOWS THE FACILITIES AND THEIR LOCATION BASED ON DATA FURNISHED BY THE CONTRACTOR AND INSPECTED BY THE CITY'S RESIDENT ENGINEER. FOR PURPOSES OF FUTURE CONSTRUCTION LOCATION OF FACILITIES MUST BE VERIFIED IN THE FIELD.

P&D CONSULTANTS, INC.

The McMullin Group ENGINEER OF WORK (EXPIRES 9-30-89)

LEROY C. BODAS, R.C.E. 22312 DATE 7/10/86

SEE SHT. NO. 13 FOR INLETS

23+14.97 - 5' TYPE 8 CURB INLET

S.M.H. NO. 5
37+39.09
EASTBOURNE R.B.

11G 37+49.09 E "A-7"
CLEANOUT
MODIFIED X=7'; Y=5'

20' STORM DRAIN EASEMENT

EASTBOURNE ROAD

CONCRETE LUG PER
STD DRAWING D-C3

NOTE: FOR STREET IMPROVEMENT
SEE SHEET NO 12

STORM DRAIN DATA

NO	BEARING	R	L	REMARKS
1	N 01°02'00"E		34.09	72" CIP PIPE (7" WALLS)
2	N 11°16'00"E	510.00'	107.33'	"
3	N 10°14'00"W		137.18'	"
4	N 10°14'00"W		38.00'	"
5	N 10°14'00"W		217.50'	72" R.C.P.
6	N 10°14'00"W		23.00'	78" R.C.P.

PRIVATE CONTRACT

PLAN FOR THE IMPROVEMENT OF:

STORM DRAIN
GABLE RIDGE ROAD
CARMEL MOUNTAIN RANCH UNIT NO. 10

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 21 OF 45 SHEETS

T.M. 85-0401
W.O. NO. 850401

C.R. Stoddard 9-17-86
FOR CITY ENGINEER DATE

DESCRIPTION	BY	L.A. ROVED	DATE	FILMED
ORIGINAL				
"A" CHANGE	MULTIPLE ERROR	CR Stoddard	12-8-87	
AS-BUILT	P&D	Rhamlet	3/1/88	

296-1767
LAMBERT COORDINATES

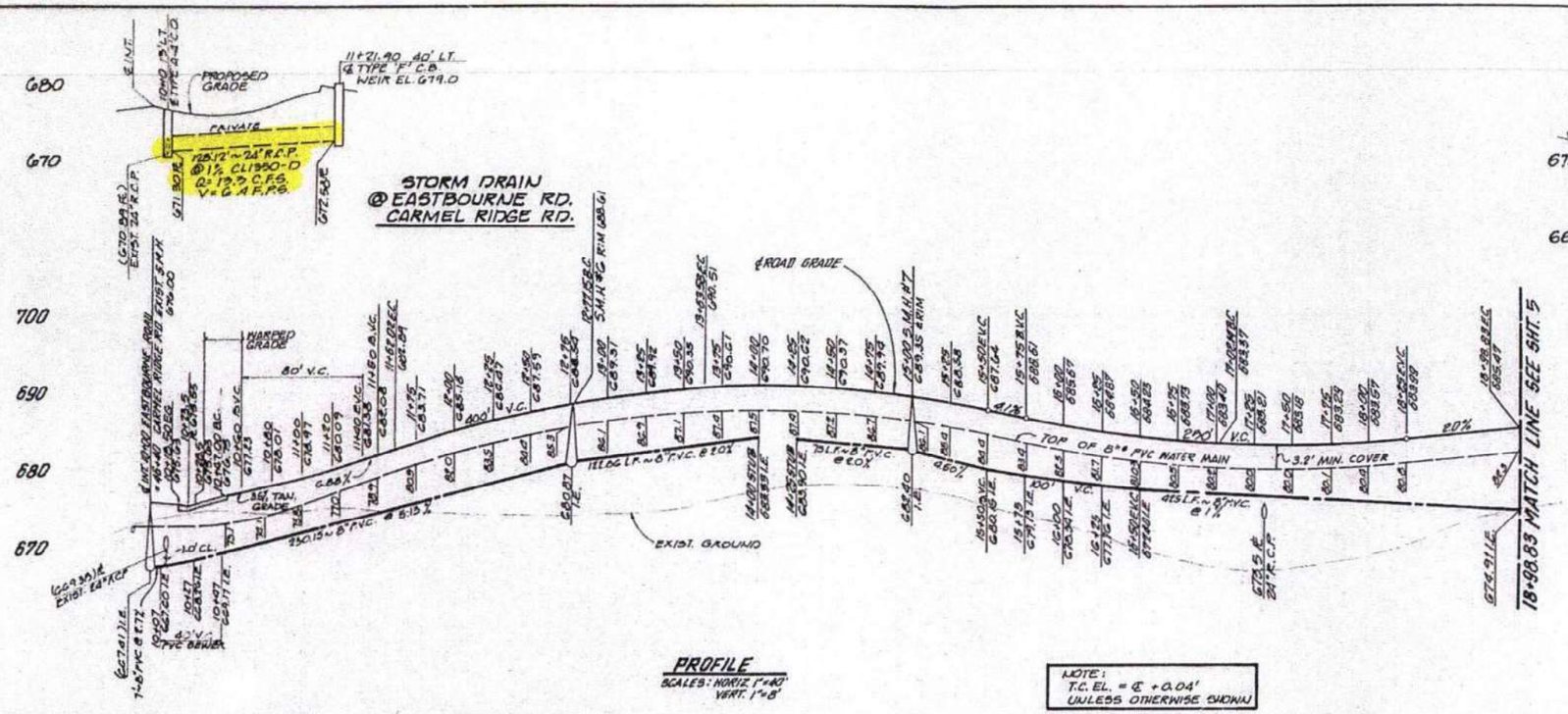
CONTRACTOR PERSLEY
INSPECTOR R. GABRIEL
DATE STARTED 10-1-86
DATE COMPLETED 1-6-88

22745-21-D
PROJECT NO. 1065

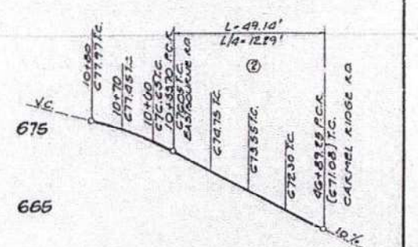
AS BUILT

A CHANGE - ADD STORM DRAIN

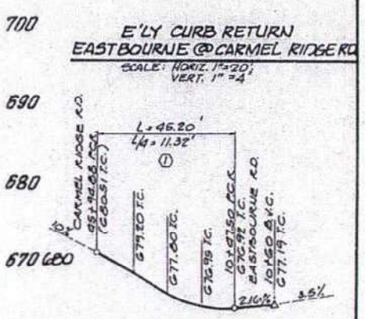
STORM DRAIN @ EASTBOURNE RD. CARMEL RIDGE RD.



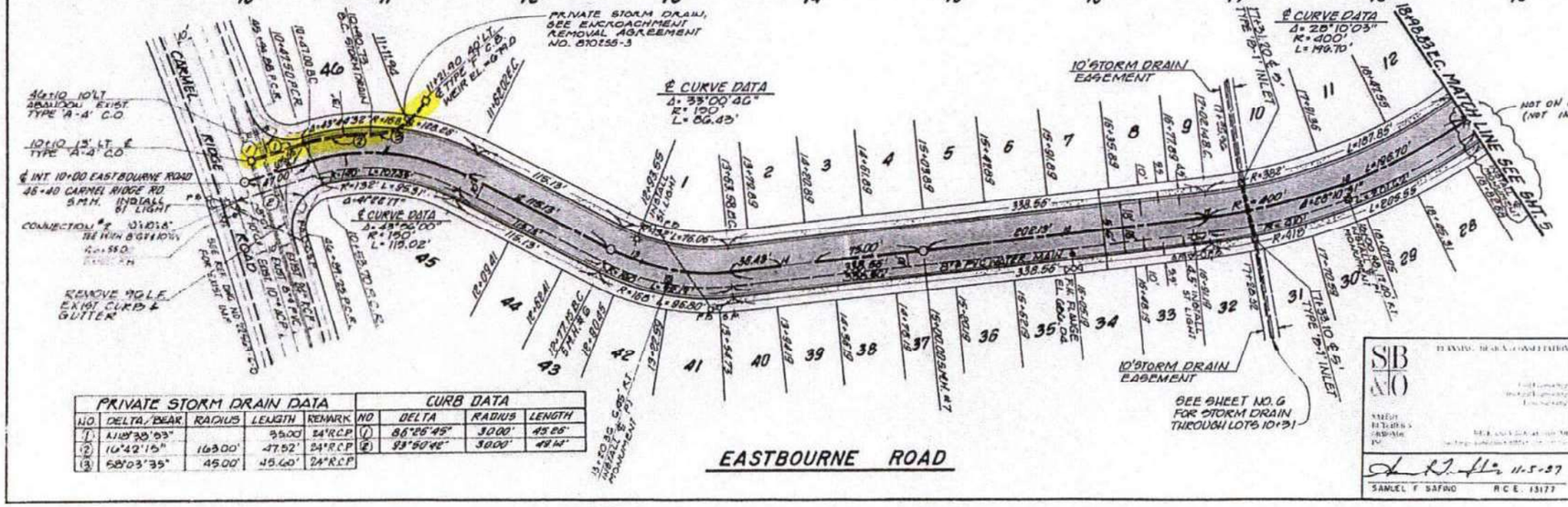
NOTE:
T.C. EL. = ℄ + 0.04'
UNLESS OTHERWISE SHOWN



E'LY CURB RETURN
EASTBOURNE @ CARMEL RIDGE RD.
SCALE: HORIZ. 1"=20', VERT. 1"=4'



W'LY CURB RETURN
EASTBOURNE @ CARMEL RIDGE RD.
SCALE: HORIZ. 1"=20', VERT. 1"=4'



PRIVATE STORM DRAIN DATA					CURB DATA			
NO	DELTA/BEAR	RADIUS	LENGTH	REMARK	NO	DELTA	RADIUS	LENGTH
(1)	N18°38'03"W		95.00	24"RCP	(1)	86°26'45"	30.00'	45.26'
(2)	16°42'15"	160.00'	47.52'	24"RCP	(2)	93°50'46"	30.00'	49.14'
(3)	68°03'35"	45.00'	46.60'	24"RCP				

PRIVATE CONTRACT

PLANS FOR THE IMPROVEMENT OF:

CARMEL MOUNTAIN RANCH UNIT 20-A

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 4 OF 25 SHEETS

T.M. 87-0255
M.P. 870258
NO

C.R. Stoddard 2-17-88

AS-BUILT 58+0 plotted 05-95

294-1745

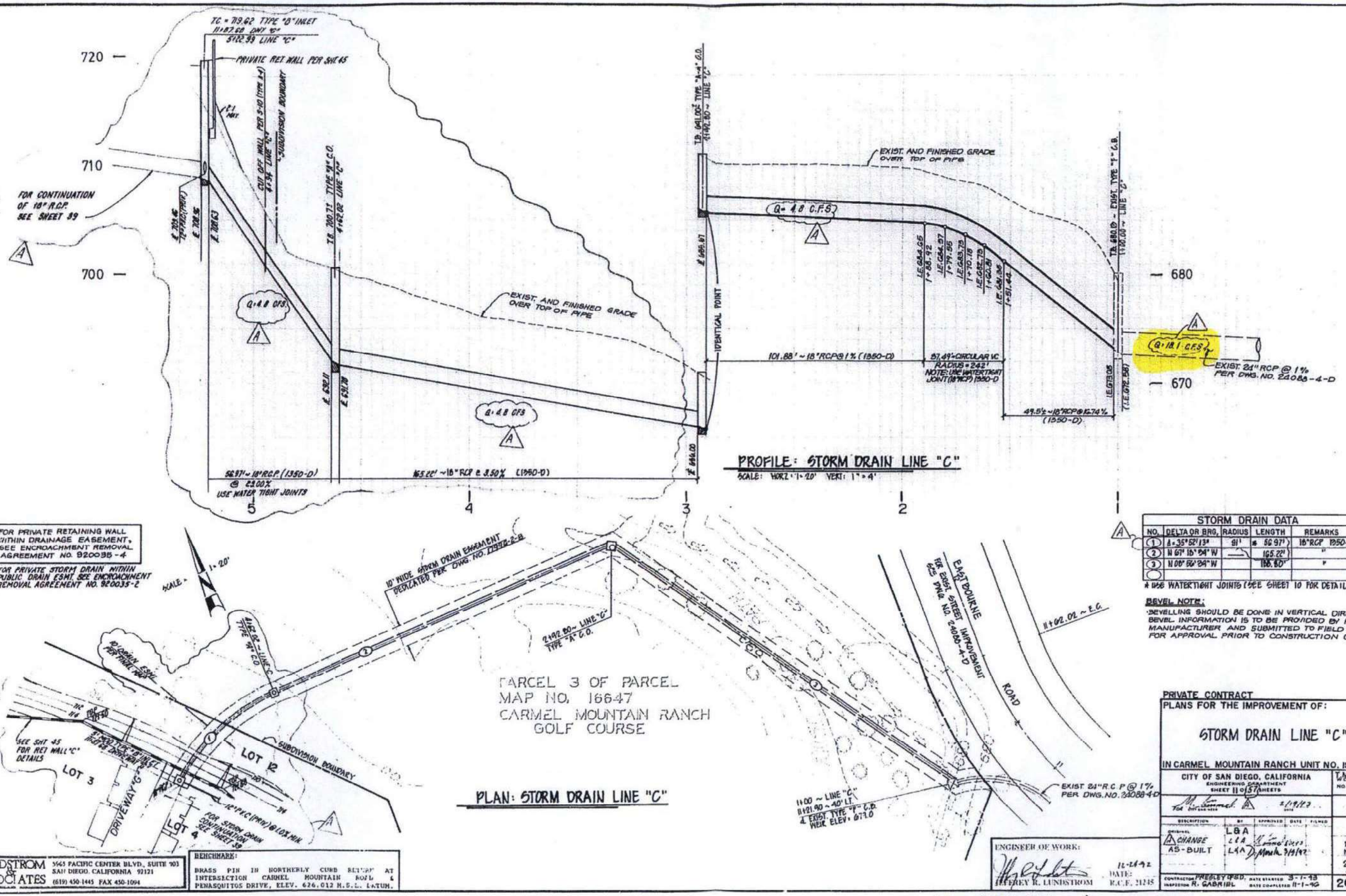
SAMUEL F. SAFINO R.C.E. 13177 — 11-5-87

20088-4-D

AS-BUILT - 8-17-95

AS BUILT

38842.10



STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	Δ = 35°52'13"	91'	# 56.97'	18" RCP 1950-D
(2)	N 61° 18' 34" W		165.22'	"
(3)	N 08° 56' 34" W		186.80'	"

USE WATERTIGHT JOINTS (SEE SHEET 10 FOR DETAIL)

BEVEL NOTE:
BEVELLING SHOULD BE DONE IN VERTICAL DIRECTION. BEVEL INFORMATION IS TO BE PROVIDED BY PIPE MANUFACTURER AND SUBMITTED TO FIELD INSPECTOR FOR APPROVAL PRIOR TO CONSTRUCTION OF PIPE

BENCHMARK:
BRASS PIN IN NORTHERLY CURB RETURN AT INTERSECTION CARMEL MOUNTAIN ROAD & PENASQUITOS DRIVE, ELEV. 626.012 M.S.L. DATUM.

LUNDSTROM & ASSOCIATES
3665 PACIFIC CENTER BLVD., SUITE 703
SAN DIEGO, CALIFORNIA 92121
(619) 450-1445 FAX 450-1094

ENGINEER OF WORK:
JEFFREY R. LUNDSTROM
R.C.E. 21245
DATE: 11-24-92

PRIVATE CONTRACT
PLANS FOR THE IMPROVEMENT OF:

STORM DRAIN LINE "C"

IN CARMEL MOUNTAIN RANCH UNIT NO. 19

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 11 OF 57 SHEETS

T.M. 90-1148
W.O. NO. 920035

DESCRIPTION	BY	APPROVED	DATE	FILED
ORIGINAL	L&A			
A CHANGE	L&A			
AS-BUILT	L&A	D. Mark	3/19/93	

1936-6305
NAD 83C
296-1745

CONTRACTOR PRESLEY DSD, DATE STARTED 3-1-93
INSPECTOR R. GABRIEL, DATE COMPLETED 11-1-93

26514-11-D

"AS-BUILT"

A CHANGE: REVISE GRADING, REVISE STORM DRAIN

APPENDIX 5

Detention Basin Routing Analysis

PROJECT DESIGN CONSULTANTS

PLANNING | LANDSCAPE ARCHITECTURE
ENGINEERING | SURVEY

WWW.PROJECTDESIGN.COM

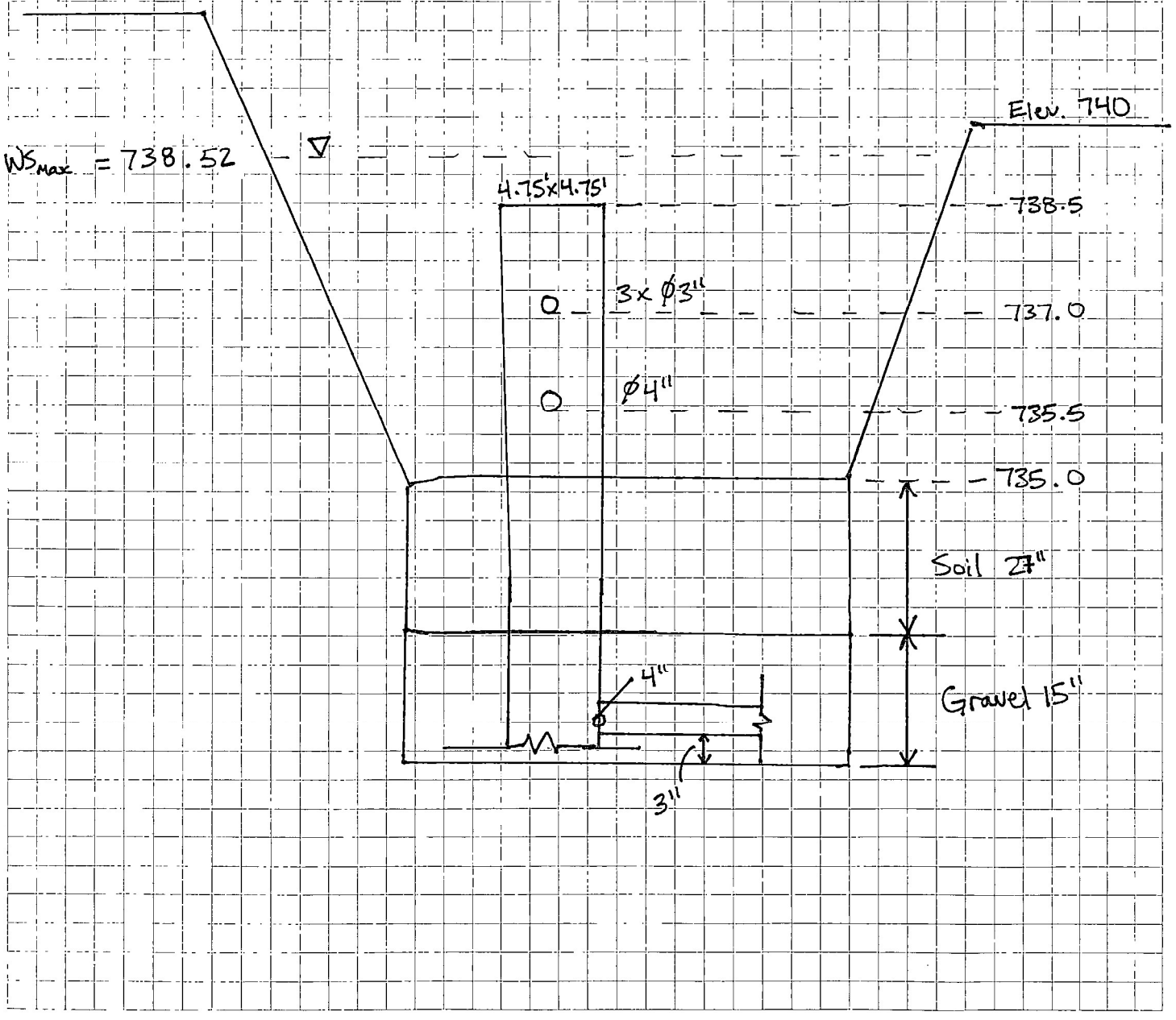
PROJECT The Hills at CMR
SUBJECT BMP Basin 9

PAGE : _____ OF _____ JOB NO. : 4394.00
DRAWN BY : G. Anderson DATE : _____
CHECKED BY : _____ DATE : _____

$Q_{max\ in} = 23.0$ cfs

$Q_{out} = 2.93$ cfs

$WS_{max} = 738.52$



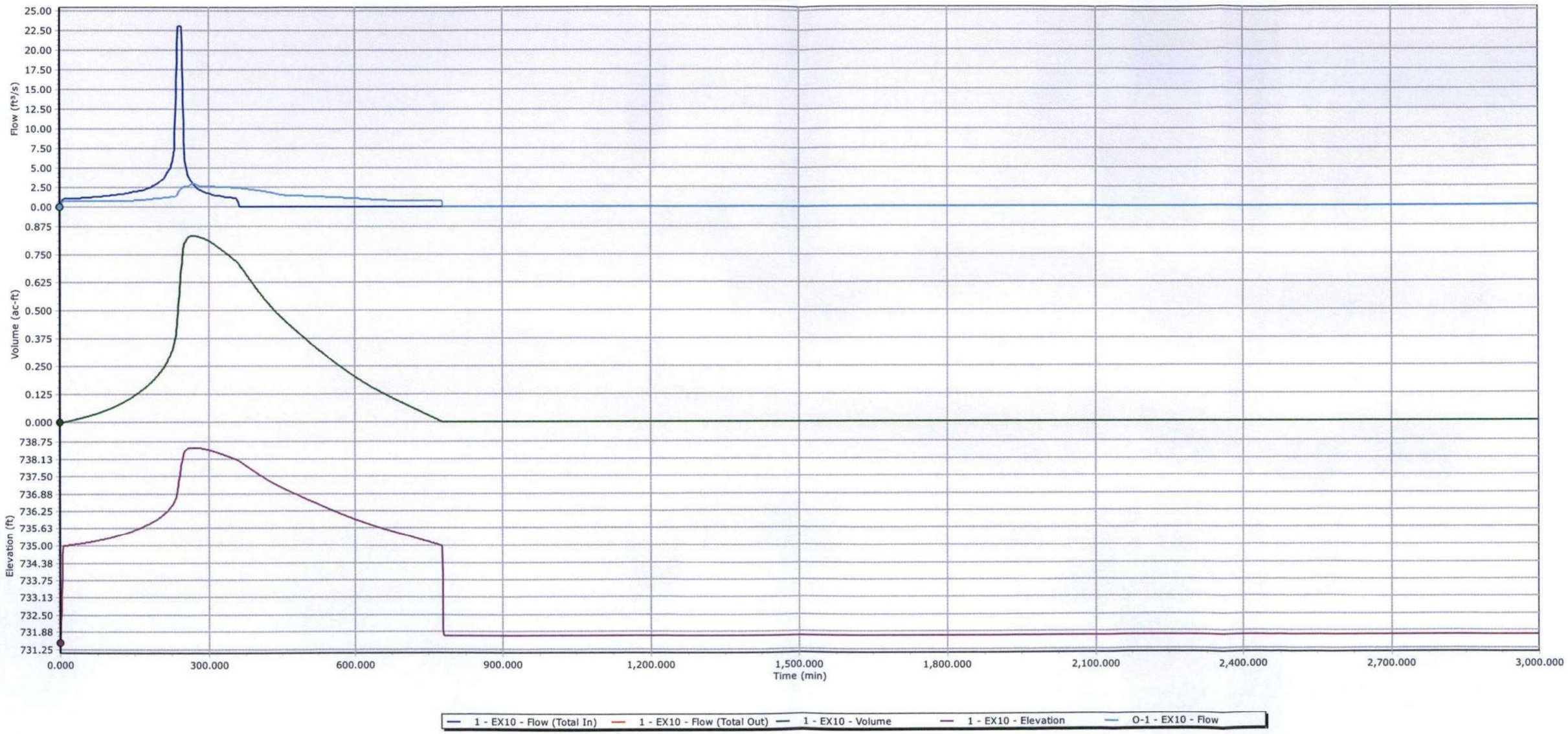
RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 9/30/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 6.96 ACRES
RUNOFF COEFFICIENT 0.83
PEAK DISCHARGE 23 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 1
TIME (MIN) = 14	DISCHARGE (CFS) = 1.1
TIME (MIN) = 21	DISCHARGE (CFS) = 1.1
TIME (MIN) = 28	DISCHARGE (CFS) = 1.1
TIME (MIN) = 35	DISCHARGE (CFS) = 1.1
TIME (MIN) = 42	DISCHARGE (CFS) = 1.1
TIME (MIN) = 49	DISCHARGE (CFS) = 1.2
TIME (MIN) = 56	DISCHARGE (CFS) = 1.2
TIME (MIN) = 63	DISCHARGE (CFS) = 1.2
TIME (MIN) = 70	DISCHARGE (CFS) = 1.3
TIME (MIN) = 77	DISCHARGE (CFS) = 1.3
TIME (MIN) = 84	DISCHARGE (CFS) = 1.3
TIME (MIN) = 91	DISCHARGE (CFS) = 1.4
TIME (MIN) = 98	DISCHARGE (CFS) = 1.4
TIME (MIN) = 105	DISCHARGE (CFS) = 1.5
TIME (MIN) = 112	DISCHARGE (CFS) = 1.5
TIME (MIN) = 119	DISCHARGE (CFS) = 1.6
TIME (MIN) = 126	DISCHARGE (CFS) = 1.6
TIME (MIN) = 133	DISCHARGE (CFS) = 1.7
TIME (MIN) = 140	DISCHARGE (CFS) = 1.8
TIME (MIN) = 147	DISCHARGE (CFS) = 1.9
TIME (MIN) = 154	DISCHARGE (CFS) = 1.9
TIME (MIN) = 161	DISCHARGE (CFS) = 2.1
TIME (MIN) = 168	DISCHARGE (CFS) = 2.1
TIME (MIN) = 175	DISCHARGE (CFS) = 2.3
TIME (MIN) = 182	DISCHARGE (CFS) = 2.4
TIME (MIN) = 189	DISCHARGE (CFS) = 2.7
TIME (MIN) = 196	DISCHARGE (CFS) = 2.9
TIME (MIN) = 203	DISCHARGE (CFS) = 3.3
TIME (MIN) = 210	DISCHARGE (CFS) = 3.6
TIME (MIN) = 217	DISCHARGE (CFS) = 4.4
TIME (MIN) = 224	DISCHARGE (CFS) = 5
TIME (MIN) = 231	DISCHARGE (CFS) = 7.3
TIME (MIN) = 238	DISCHARGE (CFS) = 24
TIME (MIN) = 245	DISCHARGE (CFS) = 23
TIME (MIN) = 252	DISCHARGE (CFS) = 5.8
TIME (MIN) = 259	DISCHARGE (CFS) = 3.9

TIME (MIN) = 266	DISCHARGE (CFS) = 3.1
TIME (MIN) = 273	DISCHARGE (CFS) = 2.6
TIME (MIN) = 280	DISCHARGE (CFS) = 2.2
TIME (MIN) = 287	DISCHARGE (CFS) = 2
TIME (MIN) = 294	DISCHARGE (CFS) = 1.8
TIME (MIN) = 301	DISCHARGE (CFS) = 1.7
TIME (MIN) = 308	DISCHARGE (CFS) = 1.5
TIME (MIN) = 315	DISCHARGE (CFS) = 1.4
TIME (MIN) = 322	DISCHARGE (CFS) = 1.4
TIME (MIN) = 329	DISCHARGE (CFS) = 1.3
TIME (MIN) = 336	DISCHARGE (CFS) = 1.2
TIME (MIN) = 343	DISCHARGE (CFS) = 1.2
TIME (MIN) = 350	DISCHARGE (CFS) = 1.1
TIME (MIN) = 357	DISCHARGE (CFS) = 1.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0

Basin 9


Flow (ft³/s)
25.00
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Volume (ac-ft)
0.875
0.750
0.625
0.500
0.375
0.250
0.125
0.000
Elevation (ft)
738.75
738.13
737.50
736.88
736.25
735.63
735.00
734.38
733.75
733.13
732.50
731.88
731.25
0.000
300.000
600.000
900.000
1,200.000
1,500.000
1,800.000
2,100.000
2,400.000
2,700.000
3,000.000
Time (min)
1 - EX10 - Flow (Total In)
1 - EX10 - Flow (Total Out)
1 - EX10 - Volume
1 - EX10 - Elevation
O-1 - EX10 - Flow

Basin 9

Project Summary	
Title	Basin 9
Engineer	PDC
Company	PDC
Date	9/30/2019

Notes

Basin 9

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
CM-1	EX10	0	1.424	238.000	23.00

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
O-1	EX10	0	1.424	268.000	2.93

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
1 (IN)	EX10	0	1.424	238.000	23.00	(N/A)	(N/A)
1 (OUT)	EX10	0	1.424	268.000	2.93	738.52	0.833

Basin 9

Subsection: Read Hydrograph
Label: CM-1

Return Event: 100 years
Storm Event:

Peak Discharge	23.00 ft³/s
Time to Peak	245.000 min
Hydrograph Volume	1.424 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 7.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.000	0.00	1.00	1.10	1.10	1.10
35.000	1.10	1.10	1.20	1.20	1.20
70.000	1.30	1.30	1.30	1.40	1.40
105.000	1.50	1.50	1.60	1.60	1.70
140.000	1.80	1.90	1.90	2.10	2.10
175.000	2.30	2.40	2.70	2.90	3.30
210.000	3.60	4.40	5.00	7.30	23.00
245.000	23.00	5.80	3.90	3.10	2.60
280.000	2.20	2.00	1.80	1.70	1.50
315.000	1.40	1.40	1.30	1.20	1.20
350.000	1.10	1.10	0.00	(N/A)	(N/A)

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.000	0.000	0.000
5.000	0.001	0.001	0.001	0.001	0.001
10.000	0.001	0.001	0.002	0.002	0.003
15.000	0.003	0.004	0.004	0.005	0.006
20.000	0.006	0.007	0.007	0.008	0.008
25.000	0.009	0.009	0.010	0.010	0.011
30.000	0.011	0.012	0.012	0.013	0.013
35.000	0.014	0.015	0.015	0.016	0.016
40.000	0.017	0.017	0.018	0.018	0.019
45.000	0.019	0.020	0.021	0.021	0.022
50.000	0.022	0.023	0.024	0.024	0.025
55.000	0.025	0.026	0.027	0.027	0.028
60.000	0.028	0.029	0.030	0.030	0.031
65.000	0.032	0.032	0.033	0.034	0.034
70.000	0.035	0.036	0.037	0.037	0.038
75.000	0.039	0.040	0.040	0.041	0.042
80.000	0.043	0.043	0.044	0.045	0.046
85.000	0.046	0.047	0.048	0.049	0.049
90.000	0.050	0.051	0.052	0.053	0.054
95.000	0.055	0.056	0.056	0.057	0.058
100.000	0.059	0.060	0.061	0.062	0.063
105.000	0.064	0.065	0.066	0.067	0.068
110.000	0.069	0.070	0.071	0.072	0.073
115.000	0.074	0.075	0.076	0.077	0.078
120.000	0.079	0.081	0.082	0.083	0.084
125.000	0.085	0.086	0.087	0.088	0.090
130.000	0.091	0.092	0.093	0.094	0.096
135.000	0.097	0.098	0.100	0.101	0.102
140.000	0.104	0.105	0.107	0.108	0.109
145.000	0.111	0.112	0.114	0.115	0.117
150.000	0.118	0.120	0.121	0.123	0.124
155.000	0.126	0.127	0.129	0.131	0.132
160.000	0.134	0.136	0.137	0.139	0.141
165.000	0.142	0.144	0.146	0.147	0.149
170.000	0.151	0.153	0.154	0.156	0.158
175.000	0.160	0.162	0.164	0.166	0.168
180.000	0.170	0.172	0.173	0.175	0.178
185.000	0.180	0.182	0.184	0.186	0.188
190.000	0.191	0.193	0.195	0.198	0.200
195.000	0.203	0.205	0.208	0.210	0.213
200.000	0.216	0.219	0.222	0.225	0.228

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
205.000	0.231	0.234	0.237	0.240	0.244
210.000	0.247	0.250	0.254	0.258	0.262
215.000	0.266	0.270	0.274	0.279	0.283
220.000	0.288	0.293	0.298	0.303	0.308
225.000	0.313	0.319	0.325	0.332	0.339
230.000	0.347	0.355	0.364	0.377	0.393
235.000	0.412	0.434	0.459	0.487	0.517
240.000	0.546	0.575	0.604	0.632	0.661
245.000	0.689	0.716	0.739	0.759	0.776
250.000	0.789	0.798	0.804	0.809	0.812
255.000	0.816	0.819	0.822	0.824	0.826
260.000	0.828	0.829	0.830	0.831	0.832
265.000	0.833	0.833	0.833	0.833	0.833
270.000	0.833	0.833	0.833	0.833	0.832
275.000	0.832	0.831	0.831	0.830	0.829
280.000	0.829	0.828	0.828	0.827	0.826
285.000	0.825	0.825	0.824	0.823	0.822
290.000	0.821	0.820	0.819	0.818	0.817
295.000	0.816	0.815	0.814	0.813	0.811
300.000	0.810	0.809	0.808	0.807	0.805
305.000	0.804	0.803	0.801	0.800	0.798
310.000	0.797	0.795	0.794	0.792	0.791
315.000	0.789	0.787	0.786	0.784	0.783
320.000	0.781	0.780	0.778	0.777	0.775
325.000	0.774	0.772	0.770	0.769	0.767
330.000	0.765	0.764	0.762	0.760	0.759
335.000	0.757	0.755	0.753	0.752	0.750
340.000	0.748	0.746	0.745	0.743	0.741
345.000	0.740	0.738	0.736	0.734	0.732
350.000	0.731	0.729	0.727	0.725	0.723
355.000	0.722	0.720	0.718	0.716	0.714
360.000	0.712	0.709	0.707	0.704	0.700
365.000	0.697	0.694	0.691	0.688	0.684
370.000	0.681	0.678	0.675	0.672	0.669
375.000	0.666	0.662	0.659	0.656	0.653
380.000	0.650	0.647	0.644	0.641	0.638
385.000	0.635	0.632	0.629	0.626	0.623
390.000	0.620	0.617	0.614	0.611	0.608
395.000	0.605	0.602	0.599	0.597	0.594
400.000	0.591	0.588	0.585	0.582	0.580
405.000	0.577	0.574	0.571	0.569	0.566

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
410.000	0.563	0.560	0.558	0.555	0.552
415.000	0.550	0.547	0.544	0.542	0.539
420.000	0.536	0.534	0.531	0.529	0.526
425.000	0.524	0.521	0.519	0.516	0.514
430.000	0.511	0.509	0.507	0.504	0.502
435.000	0.499	0.497	0.495	0.493	0.490
440.000	0.488	0.486	0.484	0.482	0.479
445.000	0.477	0.475	0.473	0.471	0.469
450.000	0.467	0.465	0.463	0.461	0.459
455.000	0.457	0.455	0.453	0.451	0.449
460.000	0.447	0.445	0.443	0.441	0.439
465.000	0.437	0.435	0.433	0.431	0.429
470.000	0.427	0.425	0.423	0.421	0.419
475.000	0.417	0.415	0.414	0.412	0.410
480.000	0.408	0.406	0.404	0.402	0.400
485.000	0.398	0.396	0.395	0.393	0.391
490.000	0.389	0.387	0.385	0.383	0.381
495.000	0.380	0.378	0.376	0.374	0.372
500.000	0.370	0.368	0.367	0.365	0.363
505.000	0.361	0.359	0.357	0.356	0.354
510.000	0.352	0.350	0.348	0.347	0.345
515.000	0.343	0.341	0.339	0.338	0.336
520.000	0.334	0.332	0.330	0.329	0.327
525.000	0.325	0.323	0.322	0.320	0.318
530.000	0.316	0.315	0.313	0.311	0.309
535.000	0.308	0.306	0.304	0.303	0.301
540.000	0.299	0.297	0.296	0.294	0.292
545.000	0.291	0.289	0.287	0.286	0.284
550.000	0.282	0.281	0.279	0.277	0.276
555.000	0.274	0.272	0.271	0.269	0.267
560.000	0.266	0.264	0.262	0.261	0.259
565.000	0.258	0.256	0.254	0.253	0.251
570.000	0.250	0.248	0.246	0.245	0.243
575.000	0.242	0.240	0.239	0.237	0.235
580.000	0.234	0.232	0.231	0.229	0.228
585.000	0.226	0.225	0.223	0.222	0.220
590.000	0.219	0.217	0.215	0.214	0.213
595.000	0.211	0.210	0.208	0.207	0.205
600.000	0.204	0.202	0.201	0.199	0.198
605.000	0.196	0.195	0.193	0.192	0.191
610.000	0.189	0.188	0.186	0.185	0.184

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	0.182	0.181	0.179	0.178	0.177
620.000	0.175	0.174	0.173	0.171	0.170
625.000	0.169	0.167	0.166	0.165	0.163
630.000	0.162	0.161	0.160	0.158	0.157
635.000	0.156	0.154	0.153	0.152	0.151
640.000	0.150	0.148	0.147	0.146	0.145
645.000	0.144	0.142	0.141	0.140	0.139
650.000	0.138	0.136	0.135	0.134	0.133
655.000	0.132	0.131	0.129	0.128	0.127
660.000	0.126	0.125	0.124	0.123	0.122
665.000	0.120	0.119	0.118	0.117	0.116
670.000	0.115	0.114	0.113	0.111	0.110
675.000	0.109	0.108	0.107	0.106	0.105
680.000	0.104	0.103	0.102	0.101	0.099
685.000	0.098	0.097	0.096	0.095	0.094
690.000	0.093	0.092	0.091	0.090	0.089
695.000	0.087	0.086	0.085	0.084	0.083
700.000	0.082	0.081	0.080	0.079	0.078
705.000	0.077	0.076	0.075	0.073	0.072
710.000	0.071	0.070	0.069	0.068	0.067
715.000	0.066	0.065	0.064	0.063	0.062
720.000	0.061	0.060	0.059	0.058	0.056
725.000	0.055	0.054	0.053	0.052	0.051
730.000	0.050	0.049	0.048	0.047	0.046
735.000	0.045	0.044	0.043	0.042	0.041
740.000	0.040	0.039	0.038	0.036	0.035
745.000	0.034	0.033	0.032	0.031	0.030
750.000	0.029	0.028	0.027	0.026	0.025
755.000	0.024	0.023	0.022	0.021	0.020
760.000	0.019	0.018	0.017	0.015	0.014
765.000	0.013	0.012	0.011	0.010	0.009
770.000	0.008	0.007	0.006	0.005	0.003
775.000	0.002	0.001	0.001	0.001	0.000
780.000	0.000	0.000	0.000	0.000	0.000
785.000	0.000	0.000	0.000	0.000	0.000
790.000	0.000	0.000	0.000	0.000	0.000
795.000	0.000	0.000	0.000	0.000	0.000
800.000	0.000	0.000	0.000	0.000	0.000
805.000	0.000	0.000	0.000	0.000	0.000
810.000	0.000	0.000	0.000	0.000	0.000
815.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
820.000	0.000	0.000	0.000	0.000	0.000
825.000	0.000	0.000	0.000	0.000	0.000
830.000	0.000	0.000	0.000	0.000	0.000
835.000	0.000	0.000	0.000	0.000	0.000
840.000	0.000	0.000	0.000	0.000	0.000
845.000	0.000	0.000	0.000	0.000	0.000
850.000	0.000	0.000	0.000	0.000	0.000
855.000	0.000	0.000	0.000	0.000	0.000
860.000	0.000	0.000	0.000	0.000	0.000
865.000	0.000	0.000	0.000	0.000	0.000
870.000	0.000	0.000	0.000	0.000	0.000
875.000	0.000	0.000	0.000	0.000	0.000
880.000	0.000	0.000	0.000	0.000	0.000
885.000	0.000	0.000	0.000	0.000	0.000
890.000	0.000	0.000	0.000	0.000	0.000
895.000	0.000	0.000	0.000	0.000	0.000
900.000	0.000	0.000	0.000	0.000	0.000
905.000	0.000	0.000	0.000	0.000	0.000
910.000	0.000	0.000	0.000	0.000	0.000
915.000	0.000	0.000	0.000	0.000	0.000
920.000	0.000	0.000	0.000	0.000	0.000
925.000	0.000	0.000	0.000	0.000	0.000
930.000	0.000	0.000	0.000	0.000	0.000
935.000	0.000	0.000	0.000	0.000	0.000
940.000	0.000	0.000	0.000	0.000	0.000
945.000	0.000	0.000	0.000	0.000	0.000
950.000	0.000	0.000	0.000	0.000	0.000
955.000	0.000	0.000	0.000	0.000	0.000
960.000	0.000	0.000	0.000	0.000	0.000
965.000	0.000	0.000	0.000	0.000	0.000
970.000	0.000	0.000	0.000	0.000	0.000
975.000	0.000	0.000	0.000	0.000	0.000
980.000	0.000	0.000	0.000	0.000	0.000
985.000	0.000	0.000	0.000	0.000	0.000
990.000	0.000	0.000	0.000	0.000	0.000
995.000	0.000	0.000	0.000	0.000	0.000
1,000.000	0.000	0.000	0.000	0.000	0.000
1,005.000	0.000	0.000	0.000	0.000	0.000
1,010.000	0.000	0.000	0.000	0.000	0.000
1,015.000	0.000	0.000	0.000	0.000	0.000
1,020.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,025.000	0.000	0.000	0.000	0.000	0.000
1,030.000	0.000	0.000	0.000	0.000	0.000
1,035.000	0.000	0.000	0.000	0.000	0.000
1,040.000	0.000	0.000	0.000	0.000	0.000
1,045.000	0.000	0.000	0.000	0.000	0.000
1,050.000	0.000	0.000	0.000	0.000	0.000
1,055.000	0.000	0.000	0.000	0.000	0.000
1,060.000	0.000	0.000	0.000	0.000	0.000
1,065.000	0.000	0.000	0.000	0.000	0.000
1,070.000	0.000	0.000	0.000	0.000	0.000
1,075.000	0.000	0.000	0.000	0.000	0.000
1,080.000	0.000	0.000	0.000	0.000	0.000
1,085.000	0.000	0.000	0.000	0.000	0.000
1,090.000	0.000	0.000	0.000	0.000	0.000
1,095.000	0.000	0.000	0.000	0.000	0.000
1,100.000	0.000	0.000	0.000	0.000	0.000
1,105.000	0.000	0.000	0.000	0.000	0.000
1,110.000	0.000	0.000	0.000	0.000	0.000
1,115.000	0.000	0.000	0.000	0.000	0.000
1,120.000	0.000	0.000	0.000	0.000	0.000
1,125.000	0.000	0.000	0.000	0.000	0.000
1,130.000	0.000	0.000	0.000	0.000	0.000
1,135.000	0.000	0.000	0.000	0.000	0.000
1,140.000	0.000	0.000	0.000	0.000	0.000
1,145.000	0.000	0.000	0.000	0.000	0.000
1,150.000	0.000	0.000	0.000	0.000	0.000
1,155.000	0.000	0.000	0.000	0.000	0.000
1,160.000	0.000	0.000	0.000	0.000	0.000
1,165.000	0.000	0.000	0.000	0.000	0.000
1,170.000	0.000	0.000	0.000	0.000	0.000
1,175.000	0.000	0.000	0.000	0.000	0.000
1,180.000	0.000	0.000	0.000	0.000	0.000
1,185.000	0.000	0.000	0.000	0.000	0.000
1,190.000	0.000	0.000	0.000	0.000	0.000
1,195.000	0.000	0.000	0.000	0.000	0.000
1,200.000	0.000	0.000	0.000	0.000	0.000
1,205.000	0.000	0.000	0.000	0.000	0.000
1,210.000	0.000	0.000	0.000	0.000	0.000
1,215.000	0.000	0.000	0.000	0.000	0.000
1,220.000	0.000	0.000	0.000	0.000	0.000
1,225.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	0.000	0.000	0.000	0.000	0.000
1,235.000	0.000	0.000	0.000	0.000	0.000
1,240.000	0.000	0.000	0.000	0.000	0.000
1,245.000	0.000	0.000	0.000	0.000	0.000
1,250.000	0.000	0.000	0.000	0.000	0.000
1,255.000	0.000	0.000	0.000	0.000	0.000
1,260.000	0.000	0.000	0.000	0.000	0.000
1,265.000	0.000	0.000	0.000	0.000	0.000
1,270.000	0.000	0.000	0.000	0.000	0.000
1,275.000	0.000	0.000	0.000	0.000	0.000
1,280.000	0.000	0.000	0.000	0.000	0.000
1,285.000	0.000	0.000	0.000	0.000	0.000
1,290.000	0.000	0.000	0.000	0.000	0.000
1,295.000	0.000	0.000	0.000	0.000	0.000
1,300.000	0.000	0.000	0.000	0.000	0.000
1,305.000	0.000	0.000	0.000	0.000	0.000
1,310.000	0.000	0.000	0.000	0.000	0.000
1,315.000	0.000	0.000	0.000	0.000	0.000
1,320.000	0.000	0.000	0.000	0.000	0.000
1,325.000	0.000	0.000	0.000	0.000	0.000
1,330.000	0.000	0.000	0.000	0.000	0.000
1,335.000	0.000	0.000	0.000	0.000	0.000
1,340.000	0.000	0.000	0.000	0.000	0.000
1,345.000	0.000	0.000	0.000	0.000	0.000
1,350.000	0.000	0.000	0.000	0.000	0.000
1,355.000	0.000	0.000	0.000	0.000	0.000
1,360.000	0.000	0.000	0.000	0.000	0.000
1,365.000	0.000	0.000	0.000	0.000	0.000
1,370.000	0.000	0.000	0.000	0.000	0.000
1,375.000	0.000	0.000	0.000	0.000	0.000
1,380.000	0.000	0.000	0.000	0.000	0.000
1,385.000	0.000	0.000	0.000	0.000	0.000
1,390.000	0.000	0.000	0.000	0.000	0.000
1,395.000	0.000	0.000	0.000	0.000	0.000
1,400.000	0.000	0.000	0.000	0.000	0.000
1,405.000	0.000	0.000	0.000	0.000	0.000
1,410.000	0.000	0.000	0.000	0.000	0.000
1,415.000	0.000	0.000	0.000	0.000	0.000
1,420.000	0.000	0.000	0.000	0.000	0.000
1,425.000	0.000	0.000	0.000	0.000	0.000
1,430.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,435.000	0.000	0.000	0.000	0.000	0.000
1,440.000	0.000	0.000	0.000	0.000	0.000
1,445.000	0.000	0.000	0.000	0.000	0.000
1,450.000	0.000	0.000	0.000	0.000	0.000
1,455.000	0.000	0.000	0.000	0.000	0.000
1,460.000	0.000	0.000	0.000	0.000	0.000
1,465.000	0.000	0.000	0.000	0.000	0.000
1,470.000	0.000	0.000	0.000	0.000	0.000
1,475.000	0.000	0.000	0.000	0.000	0.000
1,480.000	0.000	0.000	0.000	0.000	0.000
1,485.000	0.000	0.000	0.000	0.000	0.000
1,490.000	0.000	0.000	0.000	0.000	0.000
1,495.000	0.000	0.000	0.000	0.000	0.000
1,500.000	0.000	0.000	0.000	0.000	0.000
1,505.000	0.000	0.000	0.000	0.000	0.000
1,510.000	0.000	0.000	0.000	0.000	0.000
1,515.000	0.000	0.000	0.000	0.000	0.000
1,520.000	0.000	0.000	0.000	0.000	0.000
1,525.000	0.000	0.000	0.000	0.000	0.000
1,530.000	0.000	0.000	0.000	0.000	0.000
1,535.000	0.000	0.000	0.000	0.000	0.000
1,540.000	0.000	0.000	0.000	0.000	0.000
1,545.000	0.000	0.000	0.000	0.000	0.000
1,550.000	0.000	0.000	0.000	0.000	0.000
1,555.000	0.000	0.000	0.000	0.000	0.000
1,560.000	0.000	0.000	0.000	0.000	0.000
1,565.000	0.000	0.000	0.000	0.000	0.000
1,570.000	0.000	0.000	0.000	0.000	0.000
1,575.000	0.000	0.000	0.000	0.000	0.000
1,580.000	0.000	0.000	0.000	0.000	0.000
1,585.000	0.000	0.000	0.000	0.000	0.000
1,590.000	0.000	0.000	0.000	0.000	0.000
1,595.000	0.000	0.000	0.000	0.000	0.000
1,600.000	0.000	0.000	0.000	0.000	0.000
1,605.000	0.000	0.000	0.000	0.000	0.000
1,610.000	0.000	0.000	0.000	0.000	0.000
1,615.000	0.000	0.000	0.000	0.000	0.000
1,620.000	0.000	0.000	0.000	0.000	0.000
1,625.000	0.000	0.000	0.000	0.000	0.000
1,630.000	0.000	0.000	0.000	0.000	0.000
1,635.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,640.000	0.000	0.000	0.000	0.000	0.000
1,645.000	0.000	0.000	0.000	0.000	0.000
1,650.000	0.000	0.000	0.000	0.000	0.000
1,655.000	0.000	0.000	0.000	0.000	0.000
1,660.000	0.000	0.000	0.000	0.000	0.000
1,665.000	0.000	0.000	0.000	0.000	0.000
1,670.000	0.000	0.000	0.000	0.000	0.000
1,675.000	0.000	0.000	0.000	0.000	0.000
1,680.000	0.000	0.000	0.000	0.000	0.000
1,685.000	0.000	0.000	0.000	0.000	0.000
1,690.000	0.000	0.000	0.000	0.000	0.000
1,695.000	0.000	0.000	0.000	0.000	0.000
1,700.000	0.000	0.000	0.000	0.000	0.000
1,705.000	0.000	0.000	0.000	0.000	0.000
1,710.000	0.000	0.000	0.000	0.000	0.000
1,715.000	0.000	0.000	0.000	0.000	0.000
1,720.000	0.000	0.000	0.000	0.000	0.000
1,725.000	0.000	0.000	0.000	0.000	0.000
1,730.000	0.000	0.000	0.000	0.000	0.000
1,735.000	0.000	0.000	0.000	0.000	0.000
1,740.000	0.000	0.000	0.000	0.000	0.000
1,745.000	0.000	0.000	0.000	0.000	0.000
1,750.000	0.000	0.000	0.000	0.000	0.000
1,755.000	0.000	0.000	0.000	0.000	0.000
1,760.000	0.000	0.000	0.000	0.000	0.000
1,765.000	0.000	0.000	0.000	0.000	0.000
1,770.000	0.000	0.000	0.000	0.000	0.000
1,775.000	0.000	0.000	0.000	0.000	0.000
1,780.000	0.000	0.000	0.000	0.000	0.000
1,785.000	0.000	0.000	0.000	0.000	0.000
1,790.000	0.000	0.000	0.000	0.000	0.000
1,795.000	0.000	0.000	0.000	0.000	0.000
1,800.000	0.000	0.000	0.000	0.000	0.000
1,805.000	0.000	0.000	0.000	0.000	0.000
1,810.000	0.000	0.000	0.000	0.000	0.000
1,815.000	0.000	0.000	0.000	0.000	0.000
1,820.000	0.000	0.000	0.000	0.000	0.000
1,825.000	0.000	0.000	0.000	0.000	0.000
1,830.000	0.000	0.000	0.000	0.000	0.000
1,835.000	0.000	0.000	0.000	0.000	0.000
1,840.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,845.000	0.000	0.000	0.000	0.000	0.000
1,850.000	0.000	0.000	0.000	0.000	0.000
1,855.000	0.000	0.000	0.000	0.000	0.000
1,860.000	0.000	0.000	0.000	0.000	0.000
1,865.000	0.000	0.000	0.000	0.000	0.000
1,870.000	0.000	0.000	0.000	0.000	0.000
1,875.000	0.000	0.000	0.000	0.000	0.000
1,880.000	0.000	0.000	0.000	0.000	0.000
1,885.000	0.000	0.000	0.000	0.000	0.000
1,890.000	0.000	0.000	0.000	0.000	0.000
1,895.000	0.000	0.000	0.000	0.000	0.000
1,900.000	0.000	0.000	0.000	0.000	0.000
1,905.000	0.000	0.000	0.000	0.000	0.000
1,910.000	0.000	0.000	0.000	0.000	0.000
1,915.000	0.000	0.000	0.000	0.000	0.000
1,920.000	0.000	0.000	0.000	0.000	0.000
1,925.000	0.000	0.000	0.000	0.000	0.000
1,930.000	0.000	0.000	0.000	0.000	0.000
1,935.000	0.000	0.000	0.000	0.000	0.000
1,940.000	0.000	0.000	0.000	0.000	0.000
1,945.000	0.000	0.000	0.000	0.000	0.000
1,950.000	0.000	0.000	0.000	0.000	0.000
1,955.000	0.000	0.000	0.000	0.000	0.000
1,960.000	0.000	0.000	0.000	0.000	0.000
1,965.000	0.000	0.000	0.000	0.000	0.000
1,970.000	0.000	0.000	0.000	0.000	0.000
1,975.000	0.000	0.000	0.000	0.000	0.000
1,980.000	0.000	0.000	0.000	0.000	0.000
1,985.000	0.000	0.000	0.000	0.000	0.000
1,990.000	0.000	0.000	0.000	0.000	0.000
1,995.000	0.000	0.000	0.000	0.000	0.000
2,000.000	0.000	0.000	0.000	0.000	0.000
2,005.000	0.000	0.000	0.000	0.000	0.000
2,010.000	0.000	0.000	0.000	0.000	0.000
2,015.000	0.000	0.000	0.000	0.000	0.000
2,020.000	0.000	0.000	0.000	0.000	0.000
2,025.000	0.000	0.000	0.000	0.000	0.000
2,030.000	0.000	0.000	0.000	0.000	0.000
2,035.000	0.000	0.000	0.000	0.000	0.000
2,040.000	0.000	0.000	0.000	0.000	0.000
2,045.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,050.000	0.000	0.000	0.000	0.000	0.000
2,055.000	0.000	0.000	0.000	0.000	0.000
2,060.000	0.000	0.000	0.000	0.000	0.000
2,065.000	0.000	0.000	0.000	0.000	0.000
2,070.000	0.000	0.000	0.000	0.000	0.000
2,075.000	0.000	0.000	0.000	0.000	0.000
2,080.000	0.000	0.000	0.000	0.000	0.000
2,085.000	0.000	0.000	0.000	0.000	0.000
2,090.000	0.000	0.000	0.000	0.000	0.000
2,095.000	0.000	0.000	0.000	0.000	0.000
2,100.000	0.000	0.000	0.000	0.000	0.000
2,105.000	0.000	0.000	0.000	0.000	0.000
2,110.000	0.000	0.000	0.000	0.000	0.000
2,115.000	0.000	0.000	0.000	0.000	0.000
2,120.000	0.000	0.000	0.000	0.000	0.000
2,125.000	0.000	0.000	0.000	0.000	0.000
2,130.000	0.000	0.000	0.000	0.000	0.000
2,135.000	0.000	0.000	0.000	0.000	0.000
2,140.000	0.000	0.000	0.000	0.000	0.000
2,145.000	0.000	0.000	0.000	0.000	0.000
2,150.000	0.000	0.000	0.000	0.000	0.000
2,155.000	0.000	0.000	0.000	0.000	0.000
2,160.000	0.000	0.000	0.000	0.000	0.000
2,165.000	0.000	0.000	0.000	0.000	0.000
2,170.000	0.000	0.000	0.000	0.000	0.000
2,175.000	0.000	0.000	0.000	0.000	0.000
2,180.000	0.000	0.000	0.000	0.000	0.000
2,185.000	0.000	0.000	0.000	0.000	0.000
2,190.000	0.000	0.000	0.000	0.000	0.000
2,195.000	0.000	0.000	0.000	0.000	0.000
2,200.000	0.000	0.000	0.000	0.000	0.000
2,205.000	0.000	0.000	0.000	0.000	0.000
2,210.000	0.000	0.000	0.000	0.000	0.000
2,215.000	0.000	0.000	0.000	0.000	0.000
2,220.000	0.000	0.000	0.000	0.000	0.000
2,225.000	0.000	0.000	0.000	0.000	0.000
2,230.000	0.000	0.000	0.000	0.000	0.000
2,235.000	0.000	0.000	0.000	0.000	0.000
2,240.000	0.000	0.000	0.000	0.000	0.000
2,245.000	0.000	0.000	0.000	0.000	0.000
2,250.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,255.000	0.000	0.000	0.000	0.000	0.000
2,260.000	0.000	0.000	0.000	0.000	0.000
2,265.000	0.000	0.000	0.000	0.000	0.000
2,270.000	0.000	0.000	0.000	0.000	0.000
2,275.000	0.000	0.000	0.000	0.000	0.000
2,280.000	0.000	0.000	0.000	0.000	0.000
2,285.000	0.000	0.000	0.000	0.000	0.000
2,290.000	0.000	0.000	0.000	0.000	0.000
2,295.000	0.000	0.000	0.000	0.000	0.000
2,300.000	0.000	0.000	0.000	0.000	0.000
2,305.000	0.000	0.000	0.000	0.000	0.000
2,310.000	0.000	0.000	0.000	0.000	0.000
2,315.000	0.000	0.000	0.000	0.000	0.000
2,320.000	0.000	0.000	0.000	0.000	0.000
2,325.000	0.000	0.000	0.000	0.000	0.000
2,330.000	0.000	0.000	0.000	0.000	0.000
2,335.000	0.000	0.000	0.000	0.000	0.000
2,340.000	0.000	0.000	0.000	0.000	0.000
2,345.000	0.000	0.000	0.000	0.000	0.000
2,350.000	0.000	0.000	0.000	0.000	0.000
2,355.000	0.000	0.000	0.000	0.000	0.000
2,360.000	0.000	0.000	0.000	0.000	0.000
2,365.000	0.000	0.000	0.000	0.000	0.000
2,370.000	0.000	0.000	0.000	0.000	0.000
2,375.000	0.000	0.000	0.000	0.000	0.000
2,380.000	0.000	0.000	0.000	0.000	0.000
2,385.000	0.000	0.000	0.000	0.000	0.000
2,390.000	0.000	0.000	0.000	0.000	0.000
2,395.000	0.000	0.000	0.000	0.000	0.000
2,400.000	0.000	0.000	0.000	0.000	0.000
2,405.000	0.000	0.000	0.000	0.000	0.000
2,410.000	0.000	0.000	0.000	0.000	0.000
2,415.000	0.000	0.000	0.000	0.000	0.000
2,420.000	0.000	0.000	0.000	0.000	0.000
2,425.000	0.000	0.000	0.000	0.000	0.000
2,430.000	0.000	0.000	0.000	0.000	0.000
2,435.000	0.000	0.000	0.000	0.000	0.000
2,440.000	0.000	0.000	0.000	0.000	0.000
2,445.000	0.000	0.000	0.000	0.000	0.000
2,450.000	0.000	0.000	0.000	0.000	0.000
2,455.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,460.000	0.000	0.000	0.000	0.000	0.000
2,465.000	0.000	0.000	0.000	0.000	0.000
2,470.000	0.000	0.000	0.000	0.000	0.000
2,475.000	0.000	0.000	0.000	0.000	0.000
2,480.000	0.000	0.000	0.000	0.000	0.000
2,485.000	0.000	0.000	0.000	0.000	0.000
2,490.000	0.000	0.000	0.000	0.000	0.000
2,495.000	0.000	0.000	0.000	0.000	0.000
2,500.000	0.000	0.000	0.000	0.000	0.000
2,505.000	0.000	0.000	0.000	0.000	0.000
2,510.000	0.000	0.000	0.000	0.000	0.000
2,515.000	0.000	0.000	0.000	0.000	0.000
2,520.000	0.000	0.000	0.000	0.000	0.000
2,525.000	0.000	0.000	0.000	0.000	0.000
2,530.000	0.000	0.000	0.000	0.000	0.000
2,535.000	0.000	0.000	0.000	0.000	0.000
2,540.000	0.000	0.000	0.000	0.000	0.000
2,545.000	0.000	0.000	0.000	0.000	0.000
2,550.000	0.000	0.000	0.000	0.000	0.000
2,555.000	0.000	0.000	0.000	0.000	0.000
2,560.000	0.000	0.000	0.000	0.000	0.000
2,565.000	0.000	0.000	0.000	0.000	0.000
2,570.000	0.000	0.000	0.000	0.000	0.000
2,575.000	0.000	0.000	0.000	0.000	0.000
2,580.000	0.000	0.000	0.000	0.000	0.000
2,585.000	0.000	0.000	0.000	0.000	0.000
2,590.000	0.000	0.000	0.000	0.000	0.000
2,595.000	0.000	0.000	0.000	0.000	0.000
2,600.000	0.000	0.000	0.000	0.000	0.000
2,605.000	0.000	0.000	0.000	0.000	0.000
2,610.000	0.000	0.000	0.000	0.000	0.000
2,615.000	0.000	0.000	0.000	0.000	0.000
2,620.000	0.000	0.000	0.000	0.000	0.000
2,625.000	0.000	0.000	0.000	0.000	0.000
2,630.000	0.000	0.000	0.000	0.000	0.000
2,635.000	0.000	0.000	0.000	0.000	0.000
2,640.000	0.000	0.000	0.000	0.000	0.000
2,645.000	0.000	0.000	0.000	0.000	0.000
2,650.000	0.000	0.000	0.000	0.000	0.000
2,655.000	0.000	0.000	0.000	0.000	0.000
2,660.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,665.000	0.000	0.000	0.000	0.000	0.000
2,670.000	0.000	0.000	0.000	0.000	0.000
2,675.000	0.000	0.000	0.000	0.000	0.000
2,680.000	0.000	0.000	0.000	0.000	0.000
2,685.000	0.000	0.000	0.000	0.000	0.000
2,690.000	0.000	0.000	0.000	0.000	0.000
2,695.000	0.000	0.000	0.000	0.000	0.000
2,700.000	0.000	0.000	0.000	0.000	0.000
2,705.000	0.000	0.000	0.000	0.000	0.000
2,710.000	0.000	0.000	0.000	0.000	0.000
2,715.000	0.000	0.000	0.000	0.000	0.000
2,720.000	0.000	0.000	0.000	0.000	0.000
2,725.000	0.000	0.000	0.000	0.000	0.000
2,730.000	0.000	0.000	0.000	0.000	0.000
2,735.000	0.000	0.000	0.000	0.000	0.000
2,740.000	0.000	0.000	0.000	0.000	0.000
2,745.000	0.000	0.000	0.000	0.000	0.000
2,750.000	0.000	0.000	0.000	0.000	0.000
2,755.000	0.000	0.000	0.000	0.000	0.000
2,760.000	0.000	0.000	0.000	0.000	0.000
2,765.000	0.000	0.000	0.000	0.000	0.000
2,770.000	0.000	0.000	0.000	0.000	0.000
2,775.000	0.000	0.000	0.000	0.000	0.000
2,780.000	0.000	0.000	0.000	0.000	0.000
2,785.000	0.000	0.000	0.000	0.000	0.000
2,790.000	0.000	0.000	0.000	0.000	0.000
2,795.000	0.000	0.000	0.000	0.000	0.000
2,800.000	0.000	0.000	0.000	0.000	0.000
2,805.000	0.000	0.000	0.000	0.000	0.000
2,810.000	0.000	0.000	0.000	0.000	0.000
2,815.000	0.000	0.000	0.000	0.000	0.000
2,820.000	0.000	0.000	0.000	0.000	0.000
2,825.000	0.000	0.000	0.000	0.000	0.000
2,830.000	0.000	0.000	0.000	0.000	0.000
2,835.000	0.000	0.000	0.000	0.000	0.000
2,840.000	0.000	0.000	0.000	0.000	0.000
2,845.000	0.000	0.000	0.000	0.000	0.000
2,850.000	0.000	0.000	0.000	0.000	0.000
2,855.000	0.000	0.000	0.000	0.000	0.000
2,860.000	0.000	0.000	0.000	0.000	0.000
2,865.000	0.000	0.000	0.000	0.000	0.000

Basin 9

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,870.000	0.000	0.000	0.000	0.000	0.000
2,875.000	0.000	0.000	0.000	0.000	0.000
2,880.000	0.000	0.000	0.000	0.000	0.000
2,885.000	0.000	0.000	0.000	0.000	0.000
2,890.000	0.000	0.000	0.000	0.000	0.000
2,895.000	0.000	0.000	0.000	0.000	0.000
2,900.000	0.000	0.000	0.000	0.000	0.000
2,905.000	0.000	0.000	0.000	0.000	0.000
2,910.000	0.000	0.000	0.000	0.000	0.000
2,915.000	0.000	0.000	0.000	0.000	0.000
2,920.000	0.000	0.000	0.000	0.000	0.000
2,925.000	0.000	0.000	0.000	0.000	0.000
2,930.000	0.000	0.000	0.000	0.000	0.000
2,935.000	0.000	0.000	0.000	0.000	0.000
2,940.000	0.000	0.000	0.000	0.000	0.000
2,945.000	0.000	0.000	0.000	0.000	0.000
2,950.000	0.000	0.000	0.000	0.000	0.000
2,955.000	0.000	0.000	0.000	0.000	0.000
2,960.000	0.000	0.000	0.000	0.000	0.000
2,965.000	0.000	0.000	0.000	0.000	0.000
2,970.000	0.000	0.000	0.000	0.000	0.000
2,975.000	0.000	0.000	0.000	0.000	0.000
2,980.000	0.000	0.000	0.000	0.000	0.000
2,985.000	0.000	0.000	0.000	0.000	0.000
2,990.000	0.000	0.000	0.000	0.000	0.000
2,995.000	0.000	0.000	0.000	0.000	0.000
3,000.000	0.000	(N/A)	(N/A)	(N/A)	(N/A)

Basin 9

Subsection: Elevation-Area Volume Curve
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
731.49	0.0	10.000	0.000	0.000	0.000
734.99	0.0	10.000	30.000	0.001	0.001
735.00	0.0	8,913.670	9,222.228	0.001	0.002
736.00	0.0	9,681.500	27,884.825	0.213	0.215
737.00	0.0	10,474.470	30,226.153	0.231	0.446
738.00	0.0	11,292.570	32,642.870	0.250	0.696
739.00	0.0	12,135.800	35,134.965	0.269	0.965
740.00	0.0	13,004.160	37,702.439	0.288	1.253

Basin 9

Subsection: Volume Equations
Label: 1

Return Event: 100 years
Storm Event:

Pond Volume Equations
*** Incremental volume computed by the Conic Method for Reservoir Volumes.**

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Basin 9

Subsection: Outlet Input Data
Label: Outlet#1

Return Event: 100 years
Storm Event:

Requested Pond Water Surface Elevations	
Minimum (Headwater)	731.49 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	740.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	735.50	740.00
Orifice-Circular	Orifice - 2	Forward	TW	737.00	740.00
Inlet Box	Riser - 1	Forward	TW	738.50	740.00
Orifice-Circular	Orifice - Underdrain	Forward	TW	731.75	740.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Basin 9

Subsection: Outlet Input Data
Label: Outlet#1

Return Event: 100 years
Storm Event:

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	735.50 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	738.50 ft
Orifice Area	16.1 ft²
Orifice Coefficient	0.600
Weir Length	16.50 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice - Underdrain Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	731.75 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	3
Elevation	737.00 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft

Basin 9

Subsection: Outlet Input Data
Label: Outlet#1

Return Event: 100 years
Storm Event:

Convergence Tolerances	
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

Basin 9

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
731.49	0.00	(N/A)	0.00
731.59	0.00	(N/A)	0.00
731.69	0.00	(N/A)	0.00
731.75	0.00	(N/A)	0.00
731.79	0.00	(N/A)	0.00
731.89	0.04	(N/A)	0.00
731.99	0.10	(N/A)	0.00
732.09	0.17	(N/A)	0.00
732.19	0.22	(N/A)	0.00
732.29	0.26	(N/A)	0.00
732.39	0.29	(N/A)	0.00
732.49	0.32	(N/A)	0.00
732.59	0.34	(N/A)	0.00
732.69	0.37	(N/A)	0.00
732.79	0.39	(N/A)	0.00
732.89	0.41	(N/A)	0.00
732.99	0.44	(N/A)	0.00
733.09	0.45	(N/A)	0.00
733.19	0.47	(N/A)	0.00
733.29	0.49	(N/A)	0.00
733.39	0.51	(N/A)	0.00
733.49	0.53	(N/A)	0.00
733.59	0.54	(N/A)	0.00
733.69	0.56	(N/A)	0.00
733.79	0.57	(N/A)	0.00
733.89	0.59	(N/A)	0.00
733.99	0.60	(N/A)	0.00
734.09	0.62	(N/A)	0.00
734.19	0.63	(N/A)	0.00
734.29	0.65	(N/A)	0.00
734.39	0.66	(N/A)	0.00
734.49	0.67	(N/A)	0.00
734.59	0.69	(N/A)	0.00
734.69	0.70	(N/A)	0.00
734.79	0.71	(N/A)	0.00
734.89	0.72	(N/A)	0.00
734.99	0.74	(N/A)	0.00
735.09	0.75	(N/A)	0.00
735.19	0.76	(N/A)	0.00
735.29	0.77	(N/A)	0.00
735.39	0.78	(N/A)	0.00
735.49	0.79	(N/A)	0.00
735.50	0.80	(N/A)	0.00

Basin 9

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
735.59	0.82	(N/A)	0.00
735.69	0.88	(N/A)	0.00
735.79	0.96	(N/A)	0.00
735.89	1.04	(N/A)	0.00
735.99	1.09	(N/A)	0.00
736.09	1.13	(N/A)	0.00
736.19	1.17	(N/A)	0.00
736.29	1.21	(N/A)	0.00
736.39	1.25	(N/A)	0.00
736.49	1.28	(N/A)	0.00
736.59	1.31	(N/A)	0.00
736.69	1.34	(N/A)	0.00
736.79	1.37	(N/A)	0.00
736.89	1.40	(N/A)	0.00
736.99	1.43	(N/A)	0.00
737.00	1.43	(N/A)	0.00
737.09	1.50	(N/A)	0.00
737.19	1.64	(N/A)	0.00
737.29	1.80	(N/A)	0.00
737.39	1.90	(N/A)	0.00
737.49	1.99	(N/A)	0.00
737.59	2.07	(N/A)	0.00
737.69	2.14	(N/A)	0.00
737.79	2.21	(N/A)	0.00
737.89	2.27	(N/A)	0.00
737.99	2.33	(N/A)	0.00
738.09	2.39	(N/A)	0.00
738.19	2.45	(N/A)	0.00
738.29	2.51	(N/A)	0.00
738.39	2.56	(N/A)	0.00
738.49	2.61	(N/A)	0.00
738.50	2.62	(N/A)	0.00
738.59	4.00	(N/A)	0.00
738.69	6.81	(N/A)	0.00
738.79	10.49	(N/A)	0.00
738.89	14.86	(N/A)	0.00
738.99	19.83	(N/A)	0.00
739.09	25.33	(N/A)	0.00
739.19	31.31	(N/A)	0.00
739.29	37.74	(N/A)	0.00
739.39	44.59	(N/A)	0.00
739.49	51.83	(N/A)	0.00
739.59	59.44	(N/A)	0.00

Basin 9

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
739.69	67.41	(N/A)	0.00
739.79	75.71	(N/A)	0.00
739.89	84.35	(N/A)	0.00
739.99	93.30	(N/A)	0.00
740.00	94.21	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
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Orifice - Underdrain

Basin 9

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
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Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain

Basin 9

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
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Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain

Basin 9

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Riser - 1 + Orifice - Underdrain

Basin 9

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	731.49 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
731.49	0.00	0.000	10.000	0.00	0.00	0.00
731.59	0.00	0.000	10.000	0.00	0.00	0.03
731.69	0.00	0.000	10.000	0.00	0.00	0.07
731.75	0.00	0.000	10.000	0.00	0.00	0.09
731.79	0.00	0.000	10.000	0.00	0.00	0.10
731.89	0.04	0.000	10.000	0.00	0.04	0.17
731.99	0.10	0.000	10.000	0.00	0.10	0.26
732.09	0.17	0.000	10.000	0.00	0.17	0.37
732.19	0.22	0.000	10.000	0.00	0.22	0.45
732.29	0.26	0.000	10.000	0.00	0.26	0.52
732.39	0.29	0.000	10.000	0.00	0.29	0.59
732.49	0.32	0.000	10.000	0.00	0.32	0.65
732.59	0.34	0.000	10.000	0.00	0.34	0.71
732.69	0.37	0.000	10.000	0.00	0.37	0.77
732.79	0.39	0.000	10.000	0.00	0.39	0.83
732.89	0.41	0.000	10.000	0.00	0.41	0.88
732.99	0.44	0.000	10.000	0.00	0.44	0.94
733.09	0.45	0.000	10.000	0.00	0.45	0.99
733.19	0.47	0.000	10.000	0.00	0.47	1.04
733.29	0.49	0.000	10.000	0.00	0.49	1.09
733.39	0.51	0.000	10.000	0.00	0.51	1.14
733.49	0.53	0.000	10.000	0.00	0.53	1.19
733.59	0.54	0.000	10.000	0.00	0.54	1.24
733.69	0.56	0.001	10.000	0.00	0.56	1.29
733.79	0.57	0.001	10.000	0.00	0.57	1.34
733.89	0.59	0.001	10.000	0.00	0.59	1.39
733.99	0.60	0.001	10.000	0.00	0.60	1.44
734.09	0.62	0.001	10.000	0.00	0.62	1.49
734.19	0.63	0.001	10.000	0.00	0.63	1.53

Basin 9

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
734.29	0.65	0.001	10.000	0.00	0.65	1.58
734.39	0.66	0.001	10.000	0.00	0.66	1.63
734.49	0.67	0.001	10.000	0.00	0.67	1.67
734.59	0.69	0.001	10.000	0.00	0.69	1.72
734.69	0.70	0.001	10.000	0.00	0.70	1.77
734.79	0.71	0.001	10.000	0.00	0.71	1.81
734.89	0.72	0.001	10.000	0.00	0.72	1.86
734.99	0.74	0.001	10.000	0.00	0.74	1.90
735.09	0.75	0.020	8,981.476	0.00	0.75	29.78
735.19	0.76	0.041	9,057.117	0.00	0.76	59.86
735.29	0.77	0.062	9,133.075	0.00	0.77	90.19
735.39	0.78	0.083	9,209.351	0.00	0.78	120.77
735.49	0.79	0.104	9,285.943	0.00	0.79	151.61
735.50	0.80	0.106	9,293.620	0.00	0.80	154.70
735.59	0.82	0.125	9,362.853	0.00	0.82	182.71
735.69	0.88	0.147	9,440.080	0.00	0.88	214.11
735.79	0.96	0.169	9,517.625	0.00	0.96	245.78
735.89	1.04	0.191	9,595.486	0.00	1.04	277.72
735.99	1.09	0.213	9,673.665	0.00	1.09	309.88
736.09	1.13	0.235	9,751.589	0.00	1.13	342.30
736.19	1.17	0.257	9,829.763	0.00	1.17	374.98
736.29	1.21	0.280	9,908.248	0.00	1.21	407.91
736.39	1.25	0.303	9,987.046	0.00	1.25	441.11
736.49	1.28	0.326	10,066.156	0.00	1.28	474.56
736.59	1.31	0.349	10,145.578	0.00	1.31	508.28
736.69	1.34	0.373	10,225.312	0.00	1.34	542.27
736.79	1.37	0.396	10,305.358	0.00	1.37	576.51
736.89	1.40	0.420	10,385.716	0.00	1.40	611.03
736.99	1.43	0.444	10,466.386	0.00	1.43	645.81
737.00	1.43	0.446	10,474.470	0.00	1.43	649.30
737.09	1.50	0.468	10,546.839	0.00	1.50	680.90
737.19	1.64	0.492	10,627.542	0.00	1.64	716.33
737.29	1.80	0.517	10,708.552	0.00	1.80	752.05
737.39	1.90	0.541	10,789.870	0.00	1.90	787.98
737.49	1.99	0.566	10,871.496	0.00	1.99	824.17
737.59	2.07	0.591	10,953.429	0.00	2.07	860.63
737.69	2.14	0.617	11,035.669	0.00	2.14	897.35
737.79	2.21	0.642	11,118.218	0.00	2.21	934.34
737.89	2.27	0.668	11,201.073	0.00	2.27	971.60
737.99	2.33	0.693	11,284.237	0.00	2.33	1,009.14
738.09	2.39	0.719	11,367.217	0.00	2.39	1,046.95
738.19	2.45	0.746	11,450.448	0.00	2.45	1,085.04
738.29	2.51	0.772	11,533.981	0.00	2.51	1,123.40

Basin 9

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Outflow (ft^3/s)	Storage (ac-ft)	Area (ft^2)	Infiltration (ft^3/s)	Flow (Total) (ft^3/s)	2S/t + O (ft^3/s)
738.39	2.56	0.799	11,617.818	0.00	2.56	1,162.04
738.49	2.61	0.825	11,701.959	0.00	2.61	1,200.96
738.50	2.62	0.828	11,710.390	0.00	2.62	1,204.86
738.59	4.00	0.852	11,786.404	0.00	4.00	1,241.49
738.69	6.81	0.879	11,871.152	0.00	6.81	1,283.73
738.79	10.49	0.907	11,956.203	0.00	10.49	1,327.12
738.89	14.86	0.934	12,041.559	0.00	14.86	1,371.49
738.99	19.83	0.962	12,127.217	0.00	19.83	1,416.74
739.09	25.33	0.990	12,212.724	0.00	25.33	1,462.81
739.19	31.31	1.018	12,298.480	0.00	31.31	1,509.64
739.29	37.74	1.046	12,384.536	0.00	37.74	1,557.21
739.39	44.59	1.075	12,470.892	0.00	44.59	1,605.48
739.49	51.83	1.104	12,557.548	0.00	51.83	1,654.43
739.59	59.44	1.133	12,644.504	0.00	59.44	1,704.05
739.69	67.41	1.162	12,731.760	0.00	67.41	1,754.31
739.79	75.71	1.191	12,819.316	0.00	75.71	1,805.20
739.89	84.35	1.221	12,907.172	0.00	84.35	1,856.72
739.99	93.30	1.250	12,995.328	0.00	93.30	1,908.83
740.00	94.21	1.253	13,004.160	0.00	94.21	1,914.08

Basin 9

Subsection: Level Pool Pond Routing Summary
Label: 1 (IN)

Return Event: 100 years
Storm Event:

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	731.49 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	23.00 ft³/s	Time to Peak (Flow, In)	238.000 min
Flow (Peak Outlet)	2.93 ft³/s	Time to Peak (Flow, Outlet)	268.000 min

Elevation (Water Surface, Peak)	738.52 ft
Volume (Peak)	0.833 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.424 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.424 ac-ft
Volume (Retained)	0.000 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

PROJECT DESIGN CONSULTANTS

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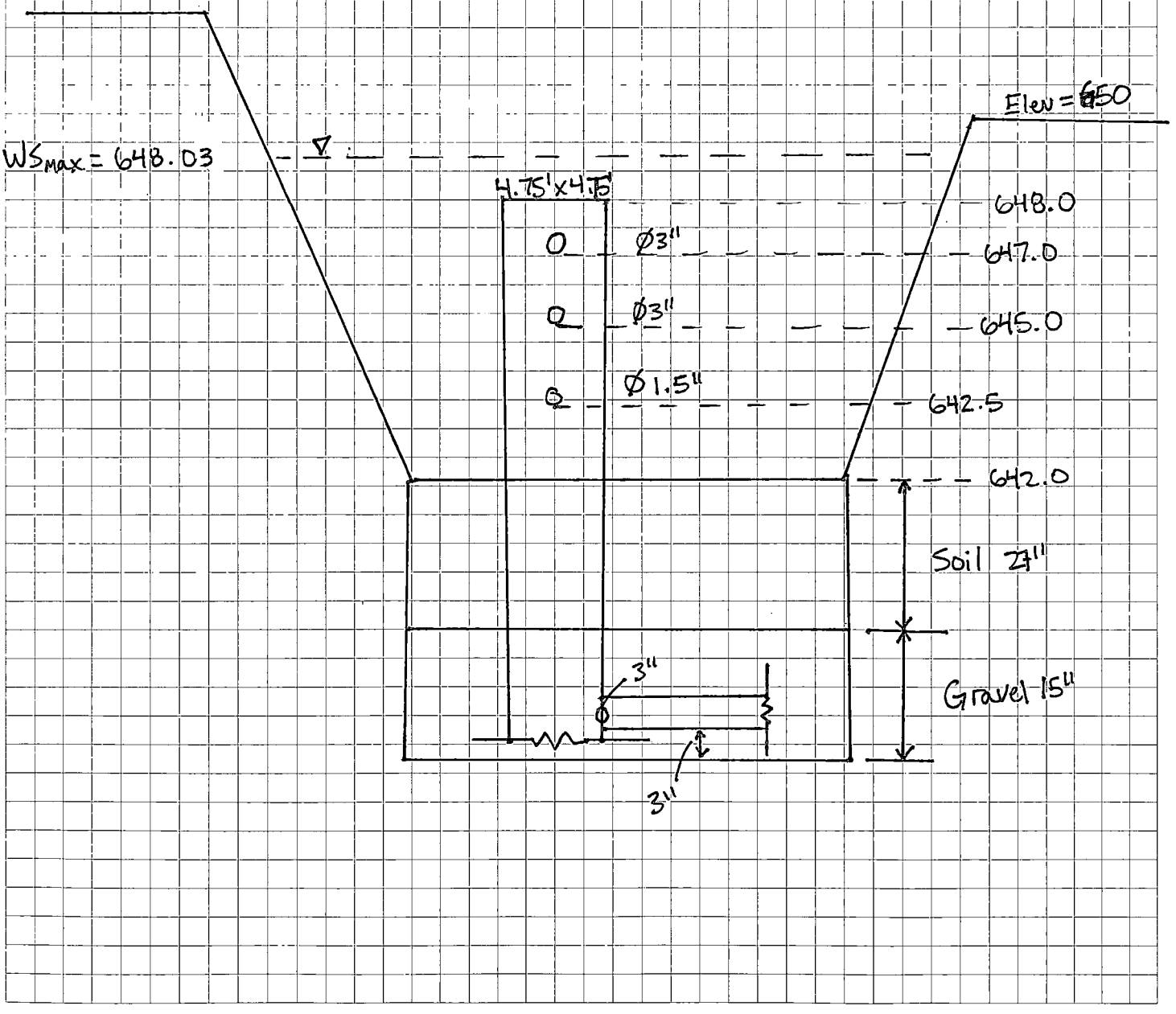
PROJECT The Hills at CMR
SUBJECT BMP Basin 11

PAGE : _____ OF _____ JOB NO. : 4394.00
DRAWN BY : G. Anderson DATE : _____
CHECKED BY : _____ DATE : _____

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$Q_{out} = 1.90$ cfs

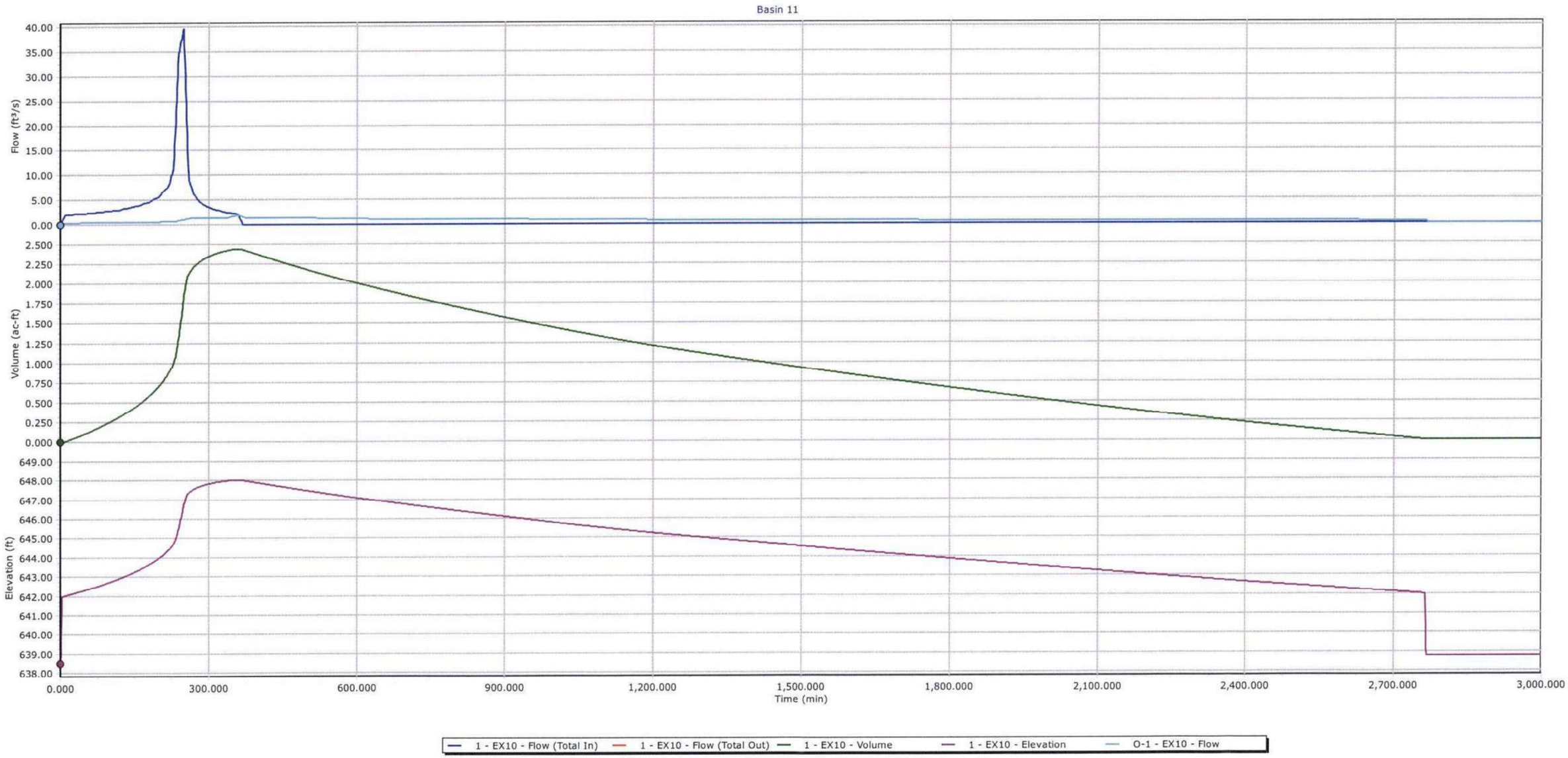
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RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 9/27/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 10 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 14.93 ACRES
RUNOFF COEFFICIENT 0.77
PEAK DISCHARGE 39.6 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 10	DISCHARGE (CFS) = 2.1
TIME (MIN) = 20	DISCHARGE (CFS) = 2.1
TIME (MIN) = 30	DISCHARGE (CFS) = 2.2
TIME (MIN) = 40	DISCHARGE (CFS) = 2.2
TIME (MIN) = 50	DISCHARGE (CFS) = 2.3
TIME (MIN) = 60	DISCHARGE (CFS) = 2.4
TIME (MIN) = 70	DISCHARGE (CFS) = 2.5
TIME (MIN) = 80	DISCHARGE (CFS) = 2.6
TIME (MIN) = 90	DISCHARGE (CFS) = 2.7
TIME (MIN) = 100	DISCHARGE (CFS) = 2.8
TIME (MIN) = 110	DISCHARGE (CFS) = 2.9
TIME (MIN) = 120	DISCHARGE (CFS) = 3
TIME (MIN) = 130	DISCHARGE (CFS) = 3.3
TIME (MIN) = 140	DISCHARGE (CFS) = 3.4
TIME (MIN) = 150	DISCHARGE (CFS) = 3.7
TIME (MIN) = 160	DISCHARGE (CFS) = 3.9
TIME (MIN) = 170	DISCHARGE (CFS) = 4.3
TIME (MIN) = 180	DISCHARGE (CFS) = 4.5
TIME (MIN) = 190	DISCHARGE (CFS) = 5.2
TIME (MIN) = 200	DISCHARGE (CFS) = 5.6
TIME (MIN) = 210	DISCHARGE (CFS) = 6.9
TIME (MIN) = 220	DISCHARGE (CFS) = 7.8
TIME (MIN) = 230	DISCHARGE (CFS) = 11.5
TIME (MIN) = 240	DISCHARGE (CFS) = 34.7
TIME (MIN) = 250	DISCHARGE (CFS) = 39.6
TIME (MIN) = 260	DISCHARGE (CFS) = 9.2
TIME (MIN) = 270	DISCHARGE (CFS) = 6.2
TIME (MIN) = 280	DISCHARGE (CFS) = 4.8
TIME (MIN) = 290	DISCHARGE (CFS) = 4
TIME (MIN) = 300	DISCHARGE (CFS) = 3.5
TIME (MIN) = 310	DISCHARGE (CFS) = 3.1
TIME (MIN) = 320	DISCHARGE (CFS) = 2.9
TIME (MIN) = 330	DISCHARGE (CFS) = 2.6
TIME (MIN) = 340	DISCHARGE (CFS) = 2.4
TIME (MIN) = 350	DISCHARGE (CFS) = 2.3
TIME (MIN) = 360	DISCHARGE (CFS) = 2.1
TIME (MIN) = 370	DISCHARGE (CFS) = 0


Basin 11
Flow (ft³/s)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Volume (ac-ft)
2.500
2.250
2.000
1.750
1.500
1.250
1.000
0.750
0.500
0.250
0.000
Elevation (ft)
649.00
648.00
647.00
646.00
645.00
644.00
643.00
642.00
641.00
640.00
639.00
638.00
0.000
300.000
600.000
900.000
1,200.000
1,500.000
1,800.000
2,100.000
2,400.000
2,700.000
3,000.000
Time (min)
1 - EX10 - Flow (Total In)
1 - EX10 - Flow (Total Out)
1 - EX10 - Volume
1 - EX10 - Elevation
O-1 - EX10 - Flow

Basin 11

Project Summary	
Title	Basin 11
Engineer	PDC
Company	PDC
Date	9/30/2019

Notes

Basin 11

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
CM-1	EX10	0	2.855	250.000	39.60

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
O-1	EX10	0	2.855	361.000	1.90

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
1 (IN)	EX10	0	2.855	250.000	39.60	(N/A)	(N/A)
1 (OUT)	EX10	0	2.855	361.000	1.90	648.03	2.438

Basin 11

Subsection: Read Hydrograph
Label: CM-1

Return Event: 100 years
Storm Event:

Peak Discharge	39.60 ft³/s
Time to Peak	250.000 min
Hydrograph Volume	2.855 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 10.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.000	0.00	2.10	2.10	2.20	2.20
50.000	2.30	2.40	2.50	2.60	2.70
100.000	2.80	2.90	3.00	3.30	3.40
150.000	3.70	3.90	4.30	4.50	5.20
200.000	5.60	6.90	7.80	11.50	34.70
250.000	39.60	9.20	6.20	4.80	4.00
300.000	3.50	3.10	2.90	2.60	2.40
350.000	2.30	2.10	0.00	(N/A)	(N/A)

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.000	0.001	0.001
5.000	0.001	0.001	0.002	0.004	0.006
10.000	0.008	0.011	0.013	0.016	0.018
15.000	0.021	0.023	0.026	0.028	0.030
20.000	0.033	0.035	0.038	0.040	0.042
25.000	0.045	0.047	0.049	0.052	0.054
30.000	0.057	0.059	0.062	0.064	0.066
35.000	0.069	0.071	0.074	0.076	0.079
40.000	0.081	0.083	0.086	0.088	0.091
45.000	0.093	0.096	0.098	0.101	0.103
50.000	0.106	0.109	0.111	0.114	0.116
55.000	0.119	0.122	0.124	0.127	0.130
60.000	0.132	0.135	0.138	0.140	0.143
65.000	0.146	0.149	0.152	0.154	0.157
70.000	0.160	0.163	0.166	0.169	0.171
75.000	0.174	0.177	0.180	0.183	0.186
80.000	0.189	0.192	0.195	0.198	0.201
85.000	0.204	0.207	0.210	0.213	0.216
90.000	0.219	0.222	0.225	0.228	0.231
95.000	0.234	0.238	0.241	0.244	0.247
100.000	0.250	0.253	0.257	0.260	0.263
105.000	0.266	0.270	0.273	0.276	0.279
110.000	0.283	0.286	0.289	0.293	0.296
115.000	0.299	0.303	0.306	0.310	0.313
120.000	0.316	0.320	0.323	0.327	0.330
125.000	0.334	0.338	0.341	0.345	0.349
130.000	0.353	0.357	0.360	0.364	0.368
135.000	0.372	0.376	0.380	0.384	0.388
140.000	0.392	0.396	0.400	0.404	0.408
145.000	0.412	0.416	0.420	0.425	0.429
150.000	0.433	0.437	0.442	0.446	0.451
155.000	0.455	0.460	0.464	0.469	0.473
160.000	0.478	0.483	0.487	0.492	0.497
165.000	0.502	0.507	0.512	0.517	0.522
170.000	0.527	0.532	0.537	0.542	0.547
175.000	0.553	0.558	0.563	0.569	0.574
180.000	0.579	0.585	0.590	0.596	0.602
185.000	0.608	0.614	0.620	0.626	0.632
190.000	0.638	0.645	0.651	0.658	0.664
195.000	0.671	0.677	0.684	0.691	0.698
200.000	0.704	0.711	0.719	0.726	0.733

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
205.000	0.741	0.749	0.757	0.765	0.774
210.000	0.782	0.791	0.800	0.809	0.818
215.000	0.827	0.836	0.846	0.855	0.865
220.000	0.875	0.885	0.895	0.907	0.918
225.000	0.930	0.943	0.956	0.970	0.984
230.000	0.999	1.015	1.035	1.058	1.084
235.000	1.113	1.146	1.181	1.220	1.262
240.000	1.307	1.354	1.402	1.450	1.499
245.000	1.548	1.598	1.649	1.701	1.753
250.000	1.805	1.856	1.903	1.946	1.984
255.000	2.018	2.048	2.074	2.095	2.112
260.000	2.125	2.136	2.146	2.156	2.166
265.000	2.175	2.183	2.191	2.199	2.206
270.000	2.213	2.220	2.226	2.232	2.238
275.000	2.244	2.250	2.255	2.260	2.265
280.000	2.270	2.275	2.279	2.284	2.288
285.000	2.292	2.296	2.300	2.304	2.308
290.000	2.312	2.315	2.319	2.322	2.325
295.000	2.328	2.332	2.335	2.338	2.341
300.000	2.344	2.346	2.349	2.352	2.355
305.000	2.357	2.360	2.362	2.365	2.367
310.000	2.369	2.372	2.374	2.376	2.378
315.000	2.380	2.382	2.385	2.387	2.389
320.000	2.391	2.393	2.395	2.396	2.398
325.000	2.400	2.402	2.404	2.405	2.407
330.000	2.408	2.410	2.412	2.413	2.414
335.000	2.416	2.417	2.419	2.420	2.421
340.000	2.423	2.424	2.425	2.426	2.428
345.000	2.429	2.430	2.431	2.431	2.432
350.000	2.433	2.434	2.435	2.435	2.436
355.000	2.436	2.437	2.437	2.438	2.438
360.000	2.438	2.438	2.438	2.438	2.437
365.000	2.436	2.435	2.434	2.432	2.430
370.000	2.428	2.426	2.424	2.422	2.420
375.000	2.418	2.416	2.414	2.412	2.410
380.000	2.408	2.406	2.404	2.402	2.400
385.000	2.398	2.396	2.394	2.392	2.390
390.000	2.388	2.386	2.384	2.382	2.380
395.000	2.378	2.376	2.374	2.372	2.370
400.000	2.368	2.366	2.364	2.362	2.360
405.000	2.358	2.356	2.354	2.352	2.350

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
410.000	2.348	2.346	2.344	2.342	2.340
415.000	2.338	2.336	2.334	2.332	2.330
420.000	2.328	2.326	2.324	2.322	2.320
425.000	2.318	2.317	2.315	2.313	2.311
430.000	2.309	2.307	2.305	2.303	2.301
435.000	2.299	2.297	2.295	2.293	2.291
440.000	2.289	2.288	2.286	2.284	2.282
445.000	2.280	2.278	2.276	2.274	2.272
450.000	2.270	2.268	2.266	2.265	2.263
455.000	2.261	2.259	2.257	2.255	2.253
460.000	2.251	2.249	2.247	2.246	2.244
465.000	2.242	2.240	2.238	2.236	2.234
470.000	2.232	2.231	2.229	2.227	2.225
475.000	2.223	2.221	2.219	2.217	2.216
480.000	2.214	2.212	2.210	2.208	2.206
485.000	2.204	2.203	2.201	2.199	2.197
490.000	2.195	2.193	2.192	2.190	2.188
495.000	2.186	2.184	2.182	2.181	2.179
500.000	2.177	2.175	2.173	2.171	2.170
505.000	2.168	2.166	2.164	2.162	2.161
510.000	2.159	2.157	2.155	2.153	2.152
515.000	2.150	2.148	2.146	2.144	2.143
520.000	2.141	2.139	2.137	2.135	2.134
525.000	2.132	2.130	2.128	2.127	2.125
530.000	2.123	2.121	2.120	2.118	2.116
535.000	2.114	2.113	2.111	2.109	2.107
540.000	2.106	2.104	2.102	2.100	2.099
545.000	2.097	2.095	2.093	2.092	2.090
550.000	2.088	2.086	2.085	2.083	2.081
555.000	2.080	2.078	2.076	2.074	2.073
560.000	2.071	2.069	2.068	2.066	2.064
565.000	2.063	2.061	2.059	2.058	2.056
570.000	2.054	2.053	2.051	2.049	2.048
575.000	2.046	2.044	2.043	2.041	2.040
580.000	2.038	2.036	2.035	2.033	2.031
585.000	2.030	2.028	2.026	2.025	2.023
590.000	2.022	2.020	2.018	2.017	2.015
595.000	2.014	2.012	2.010	2.009	2.007
600.000	2.006	2.004	2.003	2.001	1.999
605.000	1.998	1.996	1.995	1.993	1.992
610.000	1.990	1.988	1.987	1.985	1.984

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	1.982	1.981	1.979	1.977	1.976
620.000	1.974	1.973	1.971	1.970	1.968
625.000	1.967	1.965	1.964	1.962	1.960
630.000	1.959	1.957	1.956	1.954	1.953
635.000	1.951	1.950	1.948	1.947	1.945
640.000	1.943	1.942	1.940	1.939	1.937
645.000	1.936	1.934	1.933	1.931	1.930
650.000	1.928	1.927	1.925	1.924	1.922
655.000	1.921	1.919	1.917	1.916	1.914
660.000	1.913	1.911	1.910	1.908	1.907
665.000	1.905	1.904	1.902	1.901	1.899
670.000	1.898	1.896	1.895	1.893	1.892
675.000	1.890	1.889	1.887	1.886	1.884
680.000	1.883	1.881	1.880	1.878	1.877
685.000	1.875	1.874	1.872	1.871	1.869
690.000	1.868	1.866	1.865	1.863	1.862
695.000	1.860	1.859	1.857	1.856	1.854
700.000	1.853	1.851	1.850	1.848	1.847
705.000	1.845	1.844	1.842	1.841	1.839
710.000	1.838	1.836	1.835	1.833	1.832
715.000	1.830	1.829	1.827	1.826	1.824
720.000	1.823	1.821	1.820	1.818	1.817
725.000	1.815	1.814	1.812	1.811	1.809
730.000	1.808	1.806	1.805	1.804	1.802
735.000	1.801	1.799	1.798	1.796	1.795
740.000	1.793	1.792	1.790	1.789	1.787
745.000	1.786	1.785	1.783	1.782	1.780
750.000	1.779	1.777	1.776	1.774	1.773
755.000	1.771	1.770	1.768	1.767	1.766
760.000	1.764	1.763	1.761	1.760	1.758
765.000	1.757	1.755	1.754	1.752	1.751
770.000	1.750	1.748	1.747	1.745	1.744
775.000	1.742	1.741	1.739	1.738	1.737
780.000	1.735	1.734	1.732	1.731	1.729
785.000	1.728	1.727	1.725	1.724	1.722
790.000	1.721	1.719	1.718	1.717	1.715
795.000	1.714	1.712	1.711	1.709	1.708
800.000	1.707	1.705	1.704	1.702	1.701
805.000	1.699	1.698	1.697	1.695	1.694
810.000	1.692	1.691	1.689	1.688	1.687
815.000	1.685	1.684	1.682	1.681	1.680

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
820.000	1.678	1.677	1.675	1.674	1.673
825.000	1.671	1.670	1.668	1.667	1.666
830.000	1.664	1.663	1.661	1.660	1.659
835.000	1.657	1.656	1.654	1.653	1.652
840.000	1.650	1.649	1.647	1.646	1.645
845.000	1.643	1.642	1.640	1.639	1.638
850.000	1.636	1.635	1.633	1.632	1.631
855.000	1.629	1.628	1.627	1.625	1.624
860.000	1.622	1.621	1.620	1.618	1.617
865.000	1.615	1.614	1.613	1.611	1.610
870.000	1.609	1.607	1.606	1.605	1.603
875.000	1.602	1.600	1.599	1.598	1.596
880.000	1.595	1.594	1.592	1.591	1.589
885.000	1.588	1.587	1.585	1.584	1.583
890.000	1.581	1.580	1.579	1.577	1.576
895.000	1.575	1.573	1.572	1.571	1.569
900.000	1.568	1.566	1.565	1.564	1.562
905.000	1.561	1.560	1.558	1.557	1.556
910.000	1.554	1.553	1.552	1.550	1.549
915.000	1.548	1.546	1.545	1.544	1.542
920.000	1.541	1.540	1.538	1.537	1.536
925.000	1.534	1.533	1.532	1.530	1.529
930.000	1.528	1.526	1.525	1.524	1.522
935.000	1.521	1.520	1.518	1.517	1.516
940.000	1.514	1.513	1.512	1.511	1.509
945.000	1.508	1.507	1.505	1.504	1.503
950.000	1.501	1.500	1.499	1.497	1.496
955.000	1.495	1.493	1.492	1.491	1.490
960.000	1.488	1.487	1.486	1.484	1.483
965.000	1.482	1.480	1.479	1.478	1.477
970.000	1.475	1.474	1.473	1.471	1.470
975.000	1.469	1.468	1.466	1.465	1.464
980.000	1.462	1.461	1.460	1.459	1.457
985.000	1.456	1.455	1.453	1.452	1.451
990.000	1.450	1.448	1.447	1.446	1.445
995.000	1.443	1.442	1.441	1.439	1.438
1,000.000	1.437	1.436	1.434	1.433	1.432
1,005.000	1.431	1.429	1.428	1.427	1.426
1,010.000	1.424	1.423	1.422	1.420	1.419
1,015.000	1.418	1.417	1.415	1.414	1.413
1,020.000	1.412	1.410	1.409	1.408	1.407

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,025.000	1.405	1.404	1.403	1.402	1.400
1,030.000	1.399	1.398	1.397	1.396	1.394
1,035.000	1.393	1.392	1.391	1.389	1.388
1,040.000	1.387	1.386	1.384	1.383	1.382
1,045.000	1.381	1.379	1.378	1.377	1.376
1,050.000	1.375	1.373	1.372	1.371	1.370
1,055.000	1.368	1.367	1.366	1.365	1.364
1,060.000	1.362	1.361	1.360	1.359	1.358
1,065.000	1.356	1.355	1.354	1.353	1.352
1,070.000	1.350	1.349	1.348	1.347	1.345
1,075.000	1.344	1.343	1.342	1.341	1.339
1,080.000	1.338	1.337	1.336	1.335	1.333
1,085.000	1.332	1.331	1.330	1.329	1.328
1,090.000	1.326	1.325	1.324	1.323	1.322
1,095.000	1.320	1.319	1.318	1.317	1.316
1,100.000	1.315	1.313	1.312	1.311	1.310
1,105.000	1.309	1.308	1.306	1.305	1.304
1,110.000	1.303	1.302	1.301	1.299	1.298
1,115.000	1.297	1.296	1.295	1.294	1.292
1,120.000	1.291	1.290	1.289	1.288	1.287
1,125.000	1.285	1.284	1.283	1.282	1.281
1,130.000	1.280	1.279	1.277	1.276	1.275
1,135.000	1.274	1.273	1.272	1.271	1.269
1,140.000	1.268	1.267	1.266	1.265	1.264
1,145.000	1.263	1.262	1.260	1.259	1.258
1,150.000	1.257	1.256	1.255	1.254	1.253
1,155.000	1.251	1.250	1.249	1.248	1.247
1,160.000	1.246	1.245	1.244	1.243	1.241
1,165.000	1.240	1.239	1.238	1.237	1.236
1,170.000	1.235	1.234	1.233	1.232	1.230
1,175.000	1.229	1.228	1.227	1.226	1.225
1,180.000	1.224	1.223	1.222	1.221	1.220
1,185.000	1.219	1.217	1.216	1.215	1.214
1,190.000	1.213	1.212	1.211	1.210	1.209
1,195.000	1.208	1.207	1.206	1.205	1.204
1,200.000	1.203	1.202	1.201	1.199	1.198
1,205.000	1.197	1.196	1.195	1.194	1.193
1,210.000	1.192	1.191	1.190	1.189	1.188
1,215.000	1.187	1.186	1.185	1.184	1.183
1,220.000	1.182	1.181	1.180	1.179	1.178
1,225.000	1.177	1.176	1.175	1.174	1.173

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	1.172	1.171	1.170	1.169	1.168
1,235.000	1.167	1.166	1.165	1.164	1.163
1,240.000	1.162	1.161	1.160	1.159	1.158
1,245.000	1.157	1.156	1.155	1.154	1.153
1,250.000	1.152	1.151	1.150	1.149	1.149
1,255.000	1.148	1.147	1.146	1.145	1.144
1,260.000	1.143	1.142	1.141	1.140	1.139
1,265.000	1.138	1.137	1.136	1.135	1.134
1,270.000	1.133	1.132	1.131	1.130	1.129
1,275.000	1.128	1.128	1.127	1.126	1.125
1,280.000	1.124	1.123	1.122	1.121	1.120
1,285.000	1.119	1.118	1.117	1.116	1.115
1,290.000	1.114	1.113	1.113	1.112	1.111
1,295.000	1.110	1.109	1.108	1.107	1.106
1,300.000	1.105	1.104	1.103	1.102	1.101
1,305.000	1.100	1.099	1.099	1.098	1.097
1,310.000	1.096	1.095	1.094	1.093	1.092
1,315.000	1.091	1.090	1.089	1.088	1.087
1,320.000	1.086	1.086	1.085	1.084	1.083
1,325.000	1.082	1.081	1.080	1.079	1.078
1,330.000	1.077	1.076	1.075	1.074	1.074
1,335.000	1.073	1.072	1.071	1.070	1.069
1,340.000	1.068	1.067	1.066	1.065	1.064
1,345.000	1.063	1.062	1.062	1.061	1.060
1,350.000	1.059	1.058	1.057	1.056	1.055
1,355.000	1.054	1.053	1.052	1.051	1.050
1,360.000	1.050	1.049	1.048	1.047	1.046
1,365.000	1.045	1.044	1.043	1.042	1.041
1,370.000	1.040	1.039	1.039	1.038	1.037
1,375.000	1.036	1.035	1.034	1.033	1.032
1,380.000	1.031	1.030	1.029	1.029	1.028
1,385.000	1.027	1.026	1.025	1.024	1.023
1,390.000	1.022	1.021	1.020	1.019	1.018
1,395.000	1.018	1.017	1.016	1.015	1.014
1,400.000	1.013	1.012	1.011	1.010	1.009
1,405.000	1.008	1.008	1.007	1.006	1.005
1,410.000	1.004	1.003	1.002	1.001	1.000
1,415.000	0.999	0.998	0.998	0.997	0.996
1,420.000	0.995	0.994	0.993	0.992	0.991
1,425.000	0.990	0.989	0.989	0.988	0.987
1,430.000	0.986	0.985	0.984	0.983	0.982

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,435.000	0.981	0.980	0.979	0.979	0.978
1,440.000	0.977	0.976	0.975	0.974	0.973
1,445.000	0.972	0.971	0.970	0.970	0.969
1,450.000	0.968	0.967	0.966	0.965	0.964
1,455.000	0.963	0.962	0.962	0.961	0.960
1,460.000	0.959	0.958	0.957	0.956	0.955
1,465.000	0.954	0.953	0.953	0.952	0.951
1,470.000	0.950	0.949	0.948	0.947	0.946
1,475.000	0.945	0.945	0.944	0.943	0.942
1,480.000	0.941	0.940	0.939	0.938	0.937
1,485.000	0.936	0.936	0.935	0.934	0.933
1,490.000	0.932	0.931	0.930	0.929	0.928
1,495.000	0.928	0.927	0.926	0.925	0.924
1,500.000	0.923	0.922	0.921	0.920	0.920
1,505.000	0.919	0.918	0.917	0.916	0.915
1,510.000	0.914	0.913	0.912	0.912	0.911
1,515.000	0.910	0.909	0.908	0.907	0.906
1,520.000	0.905	0.905	0.904	0.903	0.902
1,525.000	0.901	0.900	0.899	0.898	0.897
1,530.000	0.897	0.896	0.895	0.894	0.893
1,535.000	0.892	0.891	0.890	0.890	0.889
1,540.000	0.888	0.887	0.886	0.885	0.884
1,545.000	0.883	0.883	0.882	0.881	0.880
1,550.000	0.879	0.878	0.877	0.876	0.876
1,555.000	0.875	0.874	0.873	0.872	0.871
1,560.000	0.870	0.869	0.869	0.868	0.867
1,565.000	0.866	0.865	0.864	0.863	0.862
1,570.000	0.862	0.861	0.860	0.859	0.858
1,575.000	0.857	0.856	0.855	0.855	0.854
1,580.000	0.853	0.852	0.851	0.850	0.849
1,585.000	0.848	0.848	0.847	0.846	0.845
1,590.000	0.844	0.843	0.842	0.842	0.841
1,595.000	0.840	0.839	0.838	0.837	0.836
1,600.000	0.835	0.835	0.834	0.833	0.832
1,605.000	0.831	0.830	0.829	0.829	0.828
1,610.000	0.827	0.826	0.825	0.824	0.823
1,615.000	0.822	0.822	0.821	0.820	0.819
1,620.000	0.818	0.817	0.816	0.816	0.815
1,625.000	0.814	0.813	0.812	0.811	0.810
1,630.000	0.810	0.809	0.808	0.807	0.806
1,635.000	0.805	0.804	0.804	0.803	0.802

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,640.000	0.801	0.800	0.799	0.798	0.798
1,645.000	0.797	0.796	0.795	0.794	0.793
1,650.000	0.792	0.792	0.791	0.790	0.789
1,655.000	0.788	0.787	0.786	0.786	0.785
1,660.000	0.784	0.783	0.782	0.781	0.780
1,665.000	0.780	0.779	0.778	0.777	0.776
1,670.000	0.775	0.775	0.774	0.773	0.772
1,675.000	0.771	0.770	0.769	0.769	0.768
1,680.000	0.767	0.766	0.765	0.764	0.764
1,685.000	0.763	0.762	0.761	0.760	0.759
1,690.000	0.758	0.758	0.757	0.756	0.755
1,695.000	0.754	0.753	0.753	0.752	0.751
1,700.000	0.750	0.749	0.748	0.747	0.747
1,705.000	0.746	0.745	0.744	0.743	0.742
1,710.000	0.742	0.741	0.740	0.739	0.738
1,715.000	0.737	0.737	0.736	0.735	0.734
1,720.000	0.733	0.732	0.731	0.731	0.730
1,725.000	0.729	0.728	0.727	0.726	0.726
1,730.000	0.725	0.724	0.723	0.722	0.721
1,735.000	0.721	0.720	0.719	0.718	0.717
1,740.000	0.716	0.716	0.715	0.714	0.713
1,745.000	0.712	0.711	0.711	0.710	0.709
1,750.000	0.708	0.707	0.706	0.706	0.705
1,755.000	0.704	0.703	0.702	0.701	0.701
1,760.000	0.700	0.699	0.698	0.697	0.697
1,765.000	0.696	0.695	0.694	0.693	0.692
1,770.000	0.692	0.691	0.690	0.689	0.688
1,775.000	0.687	0.687	0.686	0.685	0.684
1,780.000	0.683	0.682	0.682	0.681	0.680
1,785.000	0.679	0.678	0.678	0.677	0.676
1,790.000	0.675	0.674	0.673	0.673	0.672
1,795.000	0.671	0.670	0.669	0.669	0.668
1,800.000	0.667	0.666	0.665	0.664	0.664
1,805.000	0.663	0.662	0.661	0.660	0.660
1,810.000	0.659	0.658	0.657	0.656	0.655
1,815.000	0.655	0.654	0.653	0.652	0.651
1,820.000	0.651	0.650	0.649	0.648	0.647
1,825.000	0.646	0.646	0.645	0.644	0.643
1,830.000	0.642	0.642	0.641	0.640	0.639
1,835.000	0.638	0.638	0.637	0.636	0.635
1,840.000	0.634	0.633	0.633	0.632	0.631

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,845.000	0.630	0.629	0.629	0.628	0.627
1,850.000	0.626	0.625	0.625	0.624	0.623
1,855.000	0.622	0.621	0.621	0.620	0.619
1,860.000	0.618	0.617	0.617	0.616	0.615
1,865.000	0.614	0.613	0.612	0.612	0.611
1,870.000	0.610	0.609	0.608	0.608	0.607
1,875.000	0.606	0.605	0.604	0.604	0.603
1,880.000	0.602	0.601	0.600	0.600	0.599
1,885.000	0.598	0.597	0.596	0.596	0.595
1,890.000	0.594	0.593	0.592	0.592	0.591
1,895.000	0.590	0.589	0.588	0.588	0.587
1,900.000	0.586	0.585	0.585	0.584	0.583
1,905.000	0.582	0.581	0.581	0.580	0.579
1,910.000	0.578	0.577	0.577	0.576	0.575
1,915.000	0.574	0.573	0.573	0.572	0.571
1,920.000	0.570	0.569	0.569	0.568	0.567
1,925.000	0.566	0.566	0.565	0.564	0.563
1,930.000	0.562	0.562	0.561	0.560	0.559
1,935.000	0.558	0.558	0.557	0.556	0.555
1,940.000	0.554	0.554	0.553	0.552	0.551
1,945.000	0.551	0.550	0.549	0.548	0.547
1,950.000	0.547	0.546	0.545	0.544	0.543
1,955.000	0.543	0.542	0.541	0.540	0.540
1,960.000	0.539	0.538	0.537	0.536	0.536
1,965.000	0.535	0.534	0.533	0.533	0.532
1,970.000	0.531	0.530	0.529	0.529	0.528
1,975.000	0.527	0.526	0.526	0.525	0.524
1,980.000	0.523	0.522	0.522	0.521	0.520
1,985.000	0.519	0.519	0.518	0.517	0.516
1,990.000	0.515	0.515	0.514	0.513	0.512
1,995.000	0.512	0.511	0.510	0.509	0.509
2,000.000	0.508	0.507	0.506	0.505	0.505
2,005.000	0.504	0.503	0.502	0.502	0.501
2,010.000	0.500	0.499	0.499	0.498	0.497
2,015.000	0.496	0.495	0.495	0.494	0.493
2,020.000	0.492	0.492	0.491	0.490	0.489
2,025.000	0.489	0.488	0.487	0.486	0.486
2,030.000	0.485	0.484	0.483	0.482	0.482
2,035.000	0.481	0.480	0.479	0.479	0.478
2,040.000	0.477	0.476	0.476	0.475	0.474
2,045.000	0.473	0.473	0.472	0.471	0.470

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,050.000	0.470	0.469	0.468	0.467	0.466
2,055.000	0.466	0.465	0.464	0.463	0.463
2,060.000	0.462	0.461	0.460	0.460	0.459
2,065.000	0.458	0.457	0.457	0.456	0.455
2,070.000	0.454	0.454	0.453	0.452	0.451
2,075.000	0.451	0.450	0.449	0.448	0.448
2,080.000	0.447	0.446	0.445	0.445	0.444
2,085.000	0.443	0.442	0.442	0.441	0.440
2,090.000	0.439	0.439	0.438	0.437	0.436
2,095.000	0.436	0.435	0.434	0.433	0.433
2,100.000	0.432	0.431	0.430	0.430	0.429
2,105.000	0.428	0.427	0.427	0.426	0.425
2,110.000	0.424	0.424	0.423	0.422	0.422
2,115.000	0.421	0.420	0.419	0.419	0.418
2,120.000	0.417	0.416	0.416	0.415	0.414
2,125.000	0.413	0.413	0.412	0.411	0.410
2,130.000	0.410	0.409	0.408	0.407	0.407
2,135.000	0.406	0.405	0.405	0.404	0.403
2,140.000	0.402	0.402	0.401	0.400	0.399
2,145.000	0.399	0.398	0.397	0.396	0.396
2,150.000	0.395	0.394	0.394	0.393	0.392
2,155.000	0.391	0.391	0.390	0.389	0.388
2,160.000	0.388	0.387	0.386	0.385	0.385
2,165.000	0.384	0.383	0.383	0.382	0.381
2,170.000	0.380	0.380	0.379	0.378	0.378
2,175.000	0.377	0.376	0.375	0.375	0.374
2,180.000	0.373	0.372	0.372	0.371	0.370
2,185.000	0.370	0.369	0.368	0.367	0.367
2,190.000	0.366	0.365	0.364	0.364	0.363
2,195.000	0.362	0.362	0.361	0.360	0.359
2,200.000	0.359	0.358	0.357	0.357	0.356
2,205.000	0.355	0.354	0.354	0.353	0.352
2,210.000	0.352	0.351	0.350	0.349	0.349
2,215.000	0.348	0.347	0.347	0.346	0.345
2,220.000	0.344	0.344	0.343	0.342	0.342
2,225.000	0.341	0.340	0.339	0.339	0.338
2,230.000	0.337	0.337	0.336	0.335	0.334
2,235.000	0.334	0.333	0.332	0.332	0.331
2,240.000	0.330	0.329	0.329	0.328	0.327
2,245.000	0.327	0.326	0.325	0.325	0.324
2,250.000	0.323	0.322	0.322	0.321	0.320

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,255.000	0.320	0.319	0.318	0.318	0.317
2,260.000	0.316	0.315	0.315	0.314	0.313
2,265.000	0.313	0.312	0.311	0.311	0.310
2,270.000	0.309	0.308	0.308	0.307	0.306
2,275.000	0.306	0.305	0.304	0.304	0.303
2,280.000	0.302	0.301	0.301	0.300	0.299
2,285.000	0.299	0.298	0.297	0.297	0.296
2,290.000	0.295	0.295	0.294	0.293	0.292
2,295.000	0.292	0.291	0.290	0.290	0.289
2,300.000	0.288	0.288	0.287	0.286	0.286
2,305.000	0.285	0.284	0.284	0.283	0.282
2,310.000	0.281	0.281	0.280	0.279	0.279
2,315.000	0.278	0.277	0.277	0.276	0.275
2,320.000	0.275	0.274	0.273	0.273	0.272
2,325.000	0.271	0.271	0.270	0.269	0.268
2,330.000	0.268	0.267	0.266	0.266	0.265
2,335.000	0.264	0.264	0.263	0.262	0.262
2,340.000	0.261	0.260	0.260	0.259	0.258
2,345.000	0.258	0.257	0.256	0.256	0.255
2,350.000	0.254	0.254	0.253	0.252	0.252
2,355.000	0.251	0.250	0.250	0.249	0.248
2,360.000	0.248	0.247	0.246	0.246	0.245
2,365.000	0.244	0.244	0.243	0.242	0.242
2,370.000	0.241	0.240	0.240	0.239	0.238
2,375.000	0.238	0.237	0.236	0.236	0.235
2,380.000	0.234	0.234	0.233	0.232	0.232
2,385.000	0.231	0.230	0.230	0.229	0.228
2,390.000	0.228	0.227	0.226	0.226	0.225
2,395.000	0.224	0.224	0.223	0.222	0.222
2,400.000	0.221	0.221	0.220	0.219	0.219
2,405.000	0.218	0.217	0.217	0.216	0.215
2,410.000	0.215	0.214	0.213	0.213	0.212
2,415.000	0.211	0.211	0.210	0.210	0.209
2,420.000	0.208	0.208	0.207	0.206	0.206
2,425.000	0.205	0.204	0.204	0.203	0.202
2,430.000	0.202	0.201	0.201	0.200	0.199
2,435.000	0.199	0.198	0.197	0.197	0.196
2,440.000	0.195	0.195	0.194	0.194	0.193
2,445.000	0.192	0.192	0.191	0.190	0.190
2,450.000	0.189	0.189	0.188	0.187	0.187
2,455.000	0.186	0.185	0.185	0.184	0.184

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,460.000	0.183	0.182	0.182	0.181	0.180
2,465.000	0.180	0.179	0.179	0.178	0.177
2,470.000	0.177	0.176	0.175	0.175	0.174
2,475.000	0.174	0.173	0.172	0.172	0.171
2,480.000	0.170	0.170	0.169	0.169	0.168
2,485.000	0.167	0.167	0.166	0.166	0.165
2,490.000	0.164	0.164	0.163	0.162	0.162
2,495.000	0.161	0.161	0.160	0.159	0.159
2,500.000	0.158	0.157	0.157	0.156	0.156
2,505.000	0.155	0.154	0.154	0.153	0.153
2,510.000	0.152	0.151	0.151	0.150	0.149
2,515.000	0.149	0.148	0.148	0.147	0.146
2,520.000	0.146	0.145	0.145	0.144	0.143
2,525.000	0.143	0.142	0.142	0.141	0.140
2,530.000	0.140	0.139	0.138	0.138	0.137
2,535.000	0.137	0.136	0.135	0.135	0.134
2,540.000	0.134	0.133	0.132	0.132	0.131
2,545.000	0.131	0.130	0.129	0.129	0.128
2,550.000	0.128	0.127	0.126	0.126	0.125
2,555.000	0.124	0.124	0.123	0.123	0.122
2,560.000	0.121	0.121	0.120	0.120	0.119
2,565.000	0.118	0.118	0.117	0.117	0.116
2,570.000	0.115	0.115	0.114	0.114	0.113
2,575.000	0.112	0.112	0.111	0.111	0.110
2,580.000	0.109	0.109	0.108	0.108	0.107
2,585.000	0.106	0.106	0.105	0.104	0.104
2,590.000	0.103	0.103	0.102	0.101	0.101
2,595.000	0.100	0.100	0.099	0.098	0.098
2,600.000	0.097	0.097	0.096	0.095	0.095
2,605.000	0.094	0.094	0.093	0.092	0.092
2,610.000	0.091	0.091	0.090	0.089	0.089
2,615.000	0.088	0.088	0.087	0.086	0.086
2,620.000	0.085	0.085	0.084	0.083	0.083
2,625.000	0.082	0.082	0.081	0.081	0.080
2,630.000	0.079	0.079	0.078	0.078	0.077
2,635.000	0.076	0.076	0.075	0.075	0.074
2,640.000	0.073	0.073	0.072	0.072	0.071
2,645.000	0.070	0.070	0.069	0.069	0.068
2,650.000	0.067	0.067	0.066	0.066	0.065
2,655.000	0.064	0.064	0.063	0.063	0.062
2,660.000	0.062	0.061	0.060	0.060	0.059

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,665.000	0.059	0.058	0.057	0.057	0.056
2,670.000	0.056	0.055	0.054	0.054	0.053
2,675.000	0.053	0.052	0.051	0.051	0.050
2,680.000	0.050	0.049	0.049	0.048	0.047
2,685.000	0.047	0.046	0.046	0.045	0.044
2,690.000	0.044	0.043	0.043	0.042	0.042
2,695.000	0.041	0.040	0.040	0.039	0.039
2,700.000	0.038	0.037	0.037	0.036	0.036
2,705.000	0.035	0.035	0.034	0.033	0.033
2,710.000	0.032	0.032	0.031	0.030	0.030
2,715.000	0.029	0.028	0.028	0.027	0.027
2,720.000	0.026	0.025	0.025	0.024	0.023
2,725.000	0.023	0.022	0.022	0.021	0.020
2,730.000	0.020	0.019	0.018	0.018	0.017
2,735.000	0.017	0.016	0.015	0.015	0.014
2,740.000	0.013	0.013	0.012	0.012	0.011
2,745.000	0.010	0.010	0.009	0.009	0.008
2,750.000	0.007	0.007	0.006	0.005	0.005
2,755.000	0.004	0.004	0.003	0.002	0.002
2,760.000	0.001	0.001	0.001	0.001	0.001
2,765.000	0.000	0.000	0.000	0.000	0.000
2,770.000	0.000	0.000	0.000	0.000	0.000
2,775.000	0.000	0.000	0.000	0.000	0.000
2,780.000	0.000	0.000	0.000	0.000	0.000
2,785.000	0.000	0.000	0.000	0.000	0.000
2,790.000	0.000	0.000	0.000	0.000	0.000
2,795.000	0.000	0.000	0.000	0.000	0.000
2,800.000	0.000	0.000	0.000	0.000	0.000
2,805.000	0.000	0.000	0.000	0.000	0.000
2,810.000	0.000	0.000	0.000	0.000	0.000
2,815.000	0.000	0.000	0.000	0.000	0.000
2,820.000	0.000	0.000	0.000	0.000	0.000
2,825.000	0.000	0.000	0.000	0.000	0.000
2,830.000	0.000	0.000	0.000	0.000	0.000
2,835.000	0.000	0.000	0.000	0.000	0.000
2,840.000	0.000	0.000	0.000	0.000	0.000
2,845.000	0.000	0.000	0.000	0.000	0.000
2,850.000	0.000	0.000	0.000	0.000	0.000
2,855.000	0.000	0.000	0.000	0.000	0.000
2,860.000	0.000	0.000	0.000	0.000	0.000
2,865.000	0.000	0.000	0.000	0.000	0.000

Basin 11

Subsection: Time vs. Volume
Label: 1

Return Event: 100 years
Storm Event:

Time vs. Volume (ac-ft)

Output Time increment = 1.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
2,870.000	0.000	0.000	0.000	0.000	0.000
2,875.000	0.000	0.000	0.000	0.000	0.000
2,880.000	0.000	0.000	0.000	0.000	0.000
2,885.000	0.000	0.000	0.000	0.000	0.000
2,890.000	0.000	0.000	0.000	0.000	0.000
2,895.000	0.000	0.000	0.000	0.000	0.000
2,900.000	0.000	0.000	0.000	0.000	0.000
2,905.000	0.000	0.000	0.000	0.000	0.000
2,910.000	0.000	0.000	0.000	0.000	0.000
2,915.000	0.000	0.000	0.000	0.000	0.000
2,920.000	0.000	0.000	0.000	0.000	0.000
2,925.000	0.000	0.000	0.000	0.000	0.000
2,930.000	0.000	0.000	0.000	0.000	0.000
2,935.000	0.000	0.000	0.000	0.000	0.000
2,940.000	0.000	0.000	0.000	0.000	0.000
2,945.000	0.000	0.000	0.000	0.000	0.000
2,950.000	0.000	0.000	0.000	0.000	0.000
2,955.000	0.000	0.000	0.000	0.000	0.000
2,960.000	0.000	0.000	0.000	0.000	0.000
2,965.000	0.000	0.000	0.000	0.000	0.000
2,970.000	0.000	0.000	0.000	0.000	0.000
2,975.000	0.000	0.000	0.000	0.000	0.000
2,980.000	0.000	0.000	0.000	0.000	0.000
2,985.000	0.000	0.000	0.000	0.000	0.000
2,990.000	0.000	0.000	0.000	0.000	0.000
2,995.000	0.000	0.000	0.000	0.000	0.000
3,000.000	0.000	(N/A)	(N/A)	(N/A)	(N/A)

Basin 11

Subsection: Elevation-Area Volume Curve
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Planimeter (ft^2)	Area (ft^2)	A1+A2+sqr (A1*A2) (ft^2)	Volume (ac-ft)	Volume (Total) (ac-ft)
638.49	0.0	10.000	0.000	0.000	0.000
641.99	0.0	10.000	30.000	0.001	0.001
642.00	0.0	14,665.770	15,058.729	0.001	0.002
643.00	0.0	15,603.430	45,396.537	0.347	0.349
644.00	0.0	16,566.220	48,247.270	0.369	0.719
645.00	0.0	17,554.140	51,173.387	0.392	1.110
646.00	0.0	18,567.200	54,174.906	0.415	1.525
647.00	0.0	19,605.390	57,251.825	0.438	1.963
648.00	0.0	20,668.720	60,404.145	0.462	2.425
649.00	0.0	21,757.180	63,631.868	0.487	2.912
650.00	0.0	22,870.770	66,934.977	0.512	3.424

Basin 11

Subsection: Volume Equations
Label: 1

Return Event: 100 years
Storm Event:

Pond Volume Equations
* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Basin 11

Subsection: Outlet Input Data
Label: Outlet#1

Return Event: 100 years
Storm Event:

Requested Pond Water Surface Elevations	
Minimum (Headwater)	638.49 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	650.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	642.50	650.00
Orifice-Circular	Orifice - 2	Forward	TW	645.00	650.00
Orifice-Circular	Orifice - 3	Forward	TW	647.00	650.00
Inlet Box	Riser - 1	Forward	TW	648.00	650.00
Orifice-Circular	Orifice - Underdrain	Forward	TW	638.75	650.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Basin 11

Subsection: Outlet Input Data
Label: Outlet#1

Return Event: 100 years
Storm Event:

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	642.50 ft
Orifice Diameter	1.5 in
Orifice Coefficient	0.600

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	648.00 ft
Orifice Area	16.1 ft²
Orifice Coefficient	0.600
Weir Length	16.50 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice - Underdrain Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	638.75 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	645.00 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: Orifice - 3 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	647.00 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: TW

Basin 11

Subsection: Outlet Input Data
Label: Outlet#1

Return Event: 100 years
Storm Event:

Structure Type: TW Setup, DS Channel

Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
638.49	0.00	(N/A)	0.00
638.59	0.00	(N/A)	0.00
638.69	0.00	(N/A)	0.00
638.75	0.00	(N/A)	0.00
638.79	0.00	(N/A)	0.00
638.89	0.03	(N/A)	0.00
638.99	0.08	(N/A)	0.00
639.09	0.11	(N/A)	0.00
639.19	0.13	(N/A)	0.00
639.29	0.15	(N/A)	0.00
639.39	0.17	(N/A)	0.00
639.49	0.19	(N/A)	0.00
639.59	0.20	(N/A)	0.00
639.69	0.21	(N/A)	0.00
639.79	0.23	(N/A)	0.00
639.89	0.24	(N/A)	0.00
639.99	0.25	(N/A)	0.00
640.09	0.26	(N/A)	0.00
640.19	0.27	(N/A)	0.00
640.29	0.28	(N/A)	0.00
640.39	0.29	(N/A)	0.00
640.49	0.30	(N/A)	0.00
640.59	0.31	(N/A)	0.00
640.69	0.32	(N/A)	0.00
640.79	0.33	(N/A)	0.00
640.89	0.34	(N/A)	0.00
640.99	0.34	(N/A)	0.00
641.09	0.35	(N/A)	0.00
641.19	0.36	(N/A)	0.00
641.29	0.37	(N/A)	0.00
641.39	0.37	(N/A)	0.00
641.49	0.38	(N/A)	0.00
641.59	0.39	(N/A)	0.00
641.69	0.40	(N/A)	0.00
641.79	0.40	(N/A)	0.00
641.89	0.41	(N/A)	0.00
641.99	0.42	(N/A)	0.00
642.09	0.42	(N/A)	0.00
642.19	0.43	(N/A)	0.00
642.29	0.44	(N/A)	0.00
642.39	0.44	(N/A)	0.00
642.49	0.45	(N/A)	0.00
642.50	0.45	(N/A)	0.00

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
642.59	0.46	(N/A)	0.00
642.69	0.48	(N/A)	0.00
642.79	0.50	(N/A)	0.00
642.89	0.51	(N/A)	0.00
642.99	0.52	(N/A)	0.00
643.09	0.53	(N/A)	0.00
643.19	0.54	(N/A)	0.00
643.29	0.55	(N/A)	0.00
643.39	0.56	(N/A)	0.00
643.49	0.56	(N/A)	0.00
643.59	0.57	(N/A)	0.00
643.69	0.58	(N/A)	0.00
643.79	0.59	(N/A)	0.00
643.89	0.60	(N/A)	0.00
643.99	0.60	(N/A)	0.00
644.09	0.61	(N/A)	0.00
644.19	0.62	(N/A)	0.00
644.29	0.63	(N/A)	0.00
644.39	0.63	(N/A)	0.00
644.49	0.64	(N/A)	0.00
644.59	0.65	(N/A)	0.00
644.69	0.66	(N/A)	0.00
644.79	0.66	(N/A)	0.00
644.89	0.67	(N/A)	0.00
644.99	0.68	(N/A)	0.00
645.00	0.68	(N/A)	0.00
645.09	0.70	(N/A)	0.00
645.19	0.74	(N/A)	0.00
645.29	0.79	(N/A)	0.00
645.39	0.82	(N/A)	0.00
645.49	0.85	(N/A)	0.00
645.59	0.88	(N/A)	0.00
645.69	0.90	(N/A)	0.00
645.79	0.92	(N/A)	0.00
645.89	0.94	(N/A)	0.00
645.99	0.96	(N/A)	0.00
646.09	0.98	(N/A)	0.00
646.19	1.00	(N/A)	0.00
646.29	1.01	(N/A)	0.00
646.39	1.03	(N/A)	0.00
646.49	1.05	(N/A)	0.00
646.59	1.06	(N/A)	0.00
646.69	1.08	(N/A)	0.00

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
646.79	1.09	(N/A)	0.00
646.89	1.11	(N/A)	0.00
646.99	1.12	(N/A)	0.00
647.00	1.12	(N/A)	0.00
647.09	1.15	(N/A)	0.00
647.19	1.20	(N/A)	0.00
647.29	1.26	(N/A)	0.00
647.39	1.30	(N/A)	0.00
647.49	1.33	(N/A)	0.00
647.59	1.36	(N/A)	0.00
647.69	1.39	(N/A)	0.00
647.79	1.42	(N/A)	0.00
647.89	1.45	(N/A)	0.00
647.99	1.47	(N/A)	0.00
648.00	1.47	(N/A)	0.00
648.09	2.83	(N/A)	0.00
648.19	5.62	(N/A)	0.00
648.29	9.27	(N/A)	0.00
648.39	13.62	(N/A)	0.00
648.49	18.56	(N/A)	0.00
648.59	24.04	(N/A)	0.00
648.69	30.00	(N/A)	0.00
648.79	36.41	(N/A)	0.00
648.89	43.23	(N/A)	0.00
648.99	50.45	(N/A)	0.00
649.09	58.04	(N/A)	0.00
649.19	65.98	(N/A)	0.00
649.29	74.27	(N/A)	0.00
649.39	82.88	(N/A)	0.00
649.49	91.81	(N/A)	0.00
649.59	99.51	(N/A)	0.00
649.69	102.55	(N/A)	0.00
649.79	105.51	(N/A)	0.00
649.89	108.38	(N/A)	0.00
649.99	111.18	(N/A)	0.00
650.00	111.46	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
Orifice - Underdrain

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
Orifice - Underdrain
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Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
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Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - Underdrain

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
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Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain

Basin 11

Subsection: Composite Rating Curve
Label: Outlet#1

Return Event: 100 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
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Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain
Orifice - 1 + Orifice - 2 + Orifice - 3 + Riser - 1 + Orifice - Underdrain

Basin 11

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	638.49 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
638.49	0.00	0.000	10.000	0.00	0.00	0.00
638.59	0.00	0.000	10.000	0.00	0.00	0.03
638.69	0.00	0.000	10.000	0.00	0.00	0.07
638.75	0.00	0.000	10.000	0.00	0.00	0.09
638.79	0.00	0.000	10.000	0.00	0.00	0.10
638.89	0.03	0.000	10.000	0.00	0.03	0.16
638.99	0.08	0.000	10.000	0.00	0.08	0.24
639.09	0.11	0.000	10.000	0.00	0.11	0.31
639.19	0.13	0.000	10.000	0.00	0.13	0.37
639.29	0.15	0.000	10.000	0.00	0.15	0.42
639.39	0.17	0.000	10.000	0.00	0.17	0.47
639.49	0.19	0.000	10.000	0.00	0.19	0.52
639.59	0.20	0.000	10.000	0.00	0.20	0.57
639.69	0.21	0.000	10.000	0.00	0.21	0.61
639.79	0.23	0.000	10.000	0.00	0.23	0.66
639.89	0.24	0.000	10.000	0.00	0.24	0.70
639.99	0.25	0.000	10.000	0.00	0.25	0.75
640.09	0.26	0.000	10.000	0.00	0.26	0.79
640.19	0.27	0.000	10.000	0.00	0.27	0.84
640.29	0.28	0.000	10.000	0.00	0.28	0.88
640.39	0.29	0.000	10.000	0.00	0.29	0.92
640.49	0.30	0.000	10.000	0.00	0.30	0.97
640.59	0.31	0.000	10.000	0.00	0.31	1.01
640.69	0.32	0.001	10.000	0.00	0.32	1.05
640.79	0.33	0.001	10.000	0.00	0.33	1.09
640.89	0.34	0.001	10.000	0.00	0.34	1.14
640.99	0.34	0.001	10.000	0.00	0.34	1.18
641.09	0.35	0.001	10.000	0.00	0.35	1.22
641.19	0.36	0.001	10.000	0.00	0.36	1.26

Basin 11

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
641.29	0.37	0.001	10.000	0.00	0.37	1.30
641.39	0.37	0.001	10.000	0.00	0.37	1.34
641.49	0.38	0.001	10.000	0.00	0.38	1.38
641.59	0.39	0.001	10.000	0.00	0.39	1.42
641.69	0.40	0.001	10.000	0.00	0.40	1.46
641.79	0.40	0.001	10.000	0.00	0.40	1.50
641.89	0.41	0.001	10.000	0.00	0.41	1.54
641.99	0.42	0.001	10.000	0.00	0.42	1.58
642.09	0.42	0.032	14,748.970	0.00	0.42	47.39
642.19	0.43	0.066	14,841.690	0.00	0.43	96.71
642.29	0.44	0.100	14,934.700	0.00	0.44	146.34
642.39	0.44	0.135	15,028.002	0.00	0.44	196.29
642.49	0.45	0.169	15,121.593	0.00	0.45	246.54
642.50	0.45	0.173	15,130.968	0.00	0.45	251.59
642.59	0.46	0.204	15,215.475	0.00	0.46	297.12
642.69	0.48	0.239	15,309.648	0.00	0.48	348.01
642.79	0.50	0.275	15,404.111	0.00	0.50	399.22
642.89	0.51	0.310	15,498.865	0.00	0.51	450.73
642.99	0.52	0.346	15,593.910	0.00	0.52	502.56
643.09	0.53	0.382	15,688.901	0.00	0.53	554.71
643.19	0.54	0.418	15,784.142	0.00	0.54	607.18
643.29	0.55	0.454	15,879.672	0.00	0.55	659.96
643.39	0.56	0.491	15,975.490	0.00	0.56	713.06
643.49	0.56	0.527	16,071.596	0.00	0.56	766.48
643.59	0.57	0.564	16,167.990	0.00	0.57	820.22
643.69	0.58	0.602	16,264.673	0.00	0.58	874.28
643.79	0.59	0.639	16,361.643	0.00	0.59	928.67
643.89	0.60	0.677	16,458.902	0.00	0.60	983.38
643.99	0.60	0.715	16,556.449	0.00	0.60	1,038.41
644.09	0.61	0.753	16,653.961	0.00	0.61	1,093.77
644.19	0.62	0.791	16,751.723	0.00	0.62	1,149.45
644.29	0.63	0.830	16,849.771	0.00	0.63	1,205.46
644.39	0.63	0.869	16,948.106	0.00	0.63	1,261.80
644.49	0.64	0.908	17,046.726	0.00	0.64	1,318.46
644.59	0.65	0.947	17,145.632	0.00	0.65	1,375.46
644.69	0.66	0.986	17,244.825	0.00	0.66	1,432.78
644.79	0.66	1.026	17,344.304	0.00	0.66	1,490.44
644.89	0.67	1.066	17,444.068	0.00	0.67	1,548.43
644.99	0.68	1.106	17,544.119	0.00	0.68	1,606.75
645.00	0.68	1.110	17,554.140	0.00	0.68	1,612.60
645.09	0.70	1.146	17,644.152	0.00	0.70	1,665.41
645.19	0.74	1.187	17,744.435	0.00	0.74	1,724.44
645.29	0.79	1.228	17,845.002	0.00	0.79	1,783.81

Basin 11

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
645.39	0.82	1.269	17,945.853	0.00	0.82	1,843.49
645.49	0.85	1.310	18,046.989	0.00	0.85	1,903.50
645.59	0.88	1.352	18,148.408	0.00	0.88	1,963.85
645.69	0.90	1.394	18,250.112	0.00	0.90	2,024.54
645.79	0.92	1.436	18,352.100	0.00	0.92	2,085.57
645.89	0.94	1.478	18,454.372	0.00	0.94	2,146.93
645.99	0.96	1.520	18,556.929	0.00	0.96	2,208.64
646.09	0.98	1.563	18,659.481	0.00	0.98	2,270.68
646.19	1.00	1.606	18,762.283	0.00	1.00	2,333.07
646.29	1.01	1.649	18,865.368	0.00	1.01	2,395.80
646.39	1.03	1.693	18,968.735	0.00	1.03	2,458.87
646.49	1.05	1.736	19,072.384	0.00	1.05	2,522.29
646.59	1.06	1.780	19,176.316	0.00	1.06	2,586.05
646.69	1.08	1.824	19,280.531	0.00	1.08	2,650.16
646.79	1.09	1.869	19,385.027	0.00	1.09	2,714.62
646.89	1.11	1.913	19,489.807	0.00	1.11	2,779.43
646.99	1.12	1.958	19,594.868	0.00	1.12	2,844.58
647.00	1.12	1.963	19,605.390	0.00	1.12	2,851.12
647.09	1.15	2.003	19,699.940	0.00	1.15	2,910.10
647.19	1.20	2.049	19,805.262	0.00	1.20	2,975.99
647.29	1.26	2.094	19,910.865	0.00	1.26	3,042.25
647.39	1.30	2.140	20,016.749	0.00	1.30	3,108.83
647.49	1.33	2.186	20,122.913	0.00	1.33	3,175.76
647.59	1.36	2.233	20,229.359	0.00	1.36	3,243.05
647.69	1.39	2.279	20,336.085	0.00	1.39	3,310.69
647.79	1.42	2.326	20,443.092	0.00	1.42	3,378.68
647.89	1.45	2.373	20,550.379	0.00	1.45	3,447.03
647.99	1.47	2.420	20,657.948	0.00	1.47	3,515.73
648.00	1.47	2.425	20,668.720	0.00	1.47	3,522.62
648.09	2.83	2.468	20,765.538	0.00	2.83	3,586.13
648.19	5.62	2.516	20,873.378	0.00	5.62	3,658.32
648.29	9.27	2.564	20,981.498	0.00	9.27	3,731.73
648.39	13.62	2.612	21,089.897	0.00	13.62	3,806.20
648.49	18.56	2.661	21,198.576	0.00	18.56	3,881.62
648.59	24.04	2.709	21,307.533	0.00	24.04	3,957.94
648.69	30.00	2.758	21,416.770	0.00	30.00	4,035.11
648.79	36.41	2.808	21,526.287	0.00	36.41	4,113.09
648.89	43.23	2.857	21,636.082	0.00	43.23	4,191.85
648.99	50.45	2.907	21,746.157	0.00	50.45	4,271.37
649.09	58.04	2.957	21,856.265	0.00	58.04	4,351.63
649.19	65.98	3.007	21,966.624	0.00	65.98	4,432.62
649.29	74.27	3.058	22,077.260	0.00	74.27	4,514.31
649.39	82.88	3.109	22,188.174	0.00	82.88	4,596.70

Basin 11

Subsection: Elevation-Volume-Flow Table (Pond)
Label: 1

Return Event: 100 years
Storm Event:

Elevation (ft)	Outflow (ft^3/s)	Storage (ac-ft)	Area (ft^2)	Infiltration (ft^3/s)	Flow (Total) (ft^3/s)	2S/t + O (ft^3/s)
649.49	91.81	3.160	22,299.367	0.00	91.81	4,679.77
649.59	99.51	3.211	22,410.837	0.00	99.51	4,761.99
649.69	102.55	3.263	22,522.585	0.00	102.55	4,839.92
649.79	105.51	3.314	22,634.611	0.00	105.51	4,918.14
649.89	108.38	3.367	22,746.915	0.00	108.38	4,996.65
649.99	111.18	3.419	22,859.497	0.00	111.18	5,075.46
650.00	111.46	3.424	22,870.770	0.00	111.46	5,083.35

Basin 11

Subsection: Level Pool Pond Routing Summary
Label: 1 (IN)

Return Event: 100 years
Storm Event:

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	638.49 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	39.60 ft³/s	Time to Peak (Flow, In)	250.000 min
Flow (Peak Outlet)	1.90 ft³/s	Time to Peak (Flow, Outlet)	361.000 min

Elevation (Water Surface, Peak)	648.03 ft
Volume (Peak)	2.438 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	2.855 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	2.855 ac-ft
Volume (Retained)	0.000 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

APPENDIX 6

Exhibits

SHEET 3

SYSTEM 1800

SYSTEM 900

SYSTEM 100

SYSTEM 1

SYSTEM 950

POC

SEABRIDGE LN.

UNIT 1

UNIT 9

CARMEL RIDGE RD.

CHIPPENHAM WAY

BOULTON AVE.

UNIT 2

CAPEWOOD LN.

WINDCREST LN.

UNIT 8

STONEY GATE PL.

TED WILLIAMS PKWY

SYSTEM 800

EASTBOUND

5' TYPE-J INLET
(667.78 FL IN 18" RCP)
(667.75 FL OUT 18" RCP)

A-4 CLEANOUT
(667.64 FL IN 18" RCP)
(667.57 FL IN 36" CIPCP)
(667.37 FL OUT 36" RCP)

1604

1605

2.19 AC

1602

1601

1600

0.33 AC

HIGHLAND RANCH RD

SEABRIDGE LANE

UNIT 1

8.45 AC

101

11.65 AC

748.5
747.4
740.2
739.6
738.7
739.6
738.3
737.3
735
726.6
726.5
724.6
725.4
723.6
724.4
723.8
734.3
733.4
732.6
730
725
720
720.4
715
DENSE TREES GNV
TREES

LANE

UNIT 8

STONEY GATE PLACE

TREES

TREES

A-6 CLEANOUT
634.30 FL OUT (48" CIPCP)

54" RCP PER DWG 23958-8-D

TYPE B-1 INLET
(615.00 FL IN, 18" RCP)
(614.67 FL OUT, 18" RCP)

D-35 HEADWALL
(579.32 FL OUT 54" RCP)

18" RCP PER DWG 24906-2-D

18" PVC SEWER PER DWG 24906-2-D

CONCRETE ENERGY DISSIPATER
(577.50 FL OUT, 48" RCP)

48" CMP RISER
(573.65 FL IN 12" CMP)
(573.58 FL OUT 12" CMP)

STRAIGHT HEADWALL
(574.00 FL IN 12" CMP)

MOD. TYPE A-5 CLEANOUT Y=5'
(571.58 FL IN 36" RCP)
(571.25 FL OUT 36" RCP)

TYPE A-5 C.O.
(608.68 FL IN, 48" RCP)
(608.35 FL OUT, 48" RCP)

TYPE A-5 C.O.
(611.11 FL IN, 48" RCP)
(610.78 FL OUT, 48" RCP)

SWR MH
(RIM=624.37)
(610.12 IE)

6" ACP PER DWG 24906-3-D

8" PVC SEWER PER DWG 24565-10-D

8" ACP PER DWG 24906-3-D

UNIT 12

UNIT 13

TYPE A-5 CLEANOUT
(549.21 FL IN 48" RCP)
(548.88 FL OUT 48" RCP)

WING WALL
(548.50 FL OUT 48" RCP)

36" RCP PER DWG 2496

TYPE A-5 CLEANOUT
(565.54 FL IN 48" RCP)
(565.21 FL OUT 48" RCP)

MOD. TYPE A-5 CLEANOUT Y=5'
(567.73 FL IN 48" RCP)
(566.73 FL OUT 48" RCP)

0.19 AC

1.08 AC

1300

1301

1302

DENSE TREES GNV

RE LANE

0.12 AC

601

600

1.04 AC

604

4.68 AC

UNIT 6

WALL,
52.78)

651

0.22 AC

650

SHEET 3

SYSTEM 18000

SYSTEM 9000

SYSTEM 1000

SEABRIDGE LN.

UNIT 1

UNIT 9

RIDGE RD.

CARMEL

CHIPPENHAM WAY

BOULTON AVE.

UNIT 2

UNIT 8

CAPEWOOD LN.

WINDCREST LN.

STONEY GATE PL.

POC

TED WILLIAMS PKWY.

SYSTEM 8000

EASTBOUND

5' TYPE J INLET
(667.78 FL IN 18" RCP)
(667.75 FL OUT 18" RCP)

A-4 CLEANOUT
(667.64 FL IN 18" RCP)
(667.57 FL IN 36" CIPCP)
(667.37 FL OUT 36" RCP)

5.27 AC

0.20 AC

16001

16000

HIGHLAND RANCH RD

HIGHLAND RANCH RD

SEABRIDGE LANE

1.51 AC

1002

0.18 AC

1000

1001

UNIT 1

6.31 AC

748.5
747.4
DENSE TREES GNV
740.2
739.6
738.7
739.7
741.7
740
738.3
737.3
736.7
735
734.5
734.3
733.4
732.6
730
734.6
11.69 AC
725
720
720.4
715
726.6
726.5
724.6
725.4
723.6
724.4
723.1
723.8

LANE

UNIT 8

7.40 AC

STONEY GATE PLACE

8002

0.50 AC

2:1

A-6 CLEANOUT
634.30 FL OUT (48" CIPCP)

TREES

660
654
652
650
648
646
644
640
630

54" RCP PER DWG 23958-8-D

TYPE B-1 INLET
(615.00 FL IN, 18" RCP)
(614.67 FL OUT, 18" RCP)

D-35 HEADWALL
(579.32 FL OUT 54" RCP)

18" RCP PER DWG 24906-2-D

18" PVC SEWER PER DWG 24906-2-D

CONCRETE ENERGY DISSIPATER
(577.50 FL OUT, 48" RCP)

48" CMP RISER
(573.65 FL IN 12" CMP)
(573.58 FL OUT 12" CMP)

MOD. TYPE A-5 CLEANOUT Y=5'
(571.58 FL IN 36" RCP)
(571.25 FL OUT 36" RCP)

STRAIGHT HEADWALL
(574.00 FL IN 12" CMP)

TYPE A-5 C.O.
(608.68 FL IN, 48" RCP)
(608.35 FL OUT, 48" RCP)

TYPE A-5 C.O.
(611.11 FL IN, 48" RCP)
(610.78 FL OUT, 48" RCP)

SWR MH
(RIM=624.37)
(610.12 IE)

6" ACP PER DWG 24906-3-D

8" PVC SEWER PER DWG 24565-10-D

8" ACP PER DWG 24906-3-D

UNIT 12

UNIT 13

TYPE A-5 CLEANOUT
(549.21 FL IN 48" RCP)
(548.88 FL OUT 48" RCP)

WING WALL
(548.50 FL OUT 48" RCP)

36" RCP PER DWG 2496

TYPE A-5 CLEANOUT
(565.54 FL IN 48" RCP)
(565.21 FL OUT 48" RCP)

MOD. TYPE A-5 CLEANOUT Y=5'
(567.73 FL IN 48" RCP)
(566.73 FL OUT 48" RCP)

13002

0.19 AC

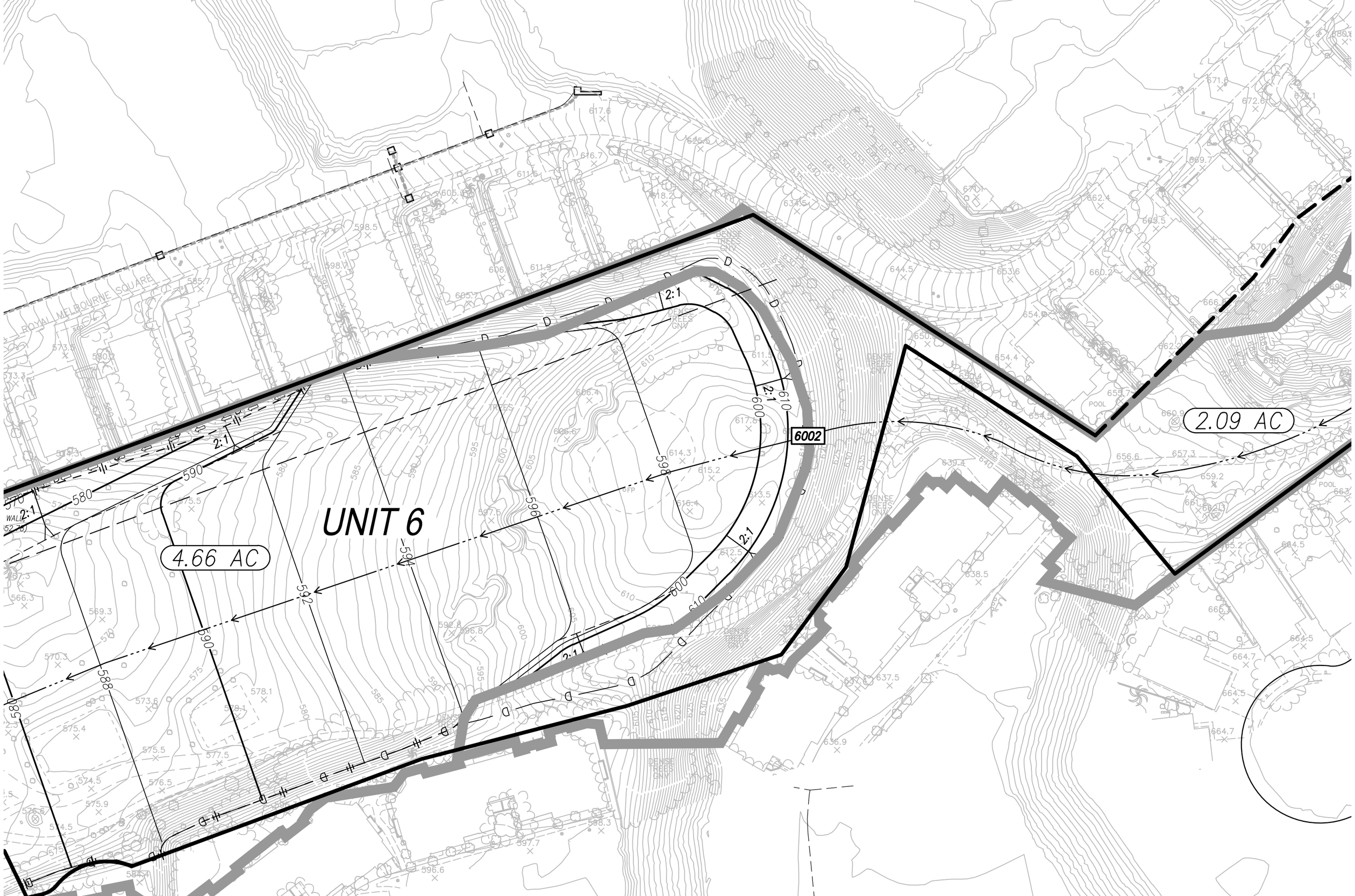
13001

13000

1.08 AC

DENSE TREES GNV

RE LANE


UNIT 6
4.66 AC
2.09 AC
6002
ROYAL MELBOURNE SQUARE
2:1
D
DENSE TREES GNV
TREES
POOL
WALL
FFP