La Jolla View Reservoir Project
Environmental Impact Report

SCH No. 2018041020 - Project No. 331101

Appendix H1

CEQA-Level Preliminary Drainage Study

February 2020

CEQA-Level Preliminary Drainage Study
for
La Jolla View Reservoir
San Diego, California

Prepared for:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

March 1, 2018. Revised July 11, 2018. Revised November 14, 2018. Revised April 10, 2019.

Tory R. Walker, R.C.E. 45005
President

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Table of Contents

Page

1. Introduction **1**

2. Project Description **1**

3. Drainage Patterns and Hydrologic Methodology **2**

4. Summary and Conclusions **3**

5. Declaration of Responsible Charge **5**

Appendices

A. City of San Diego Figures and Nomographs

B. Rational Method Calculations (Q100)

C. Project Maps

- **Existing Condition Hydrology Map**
- **Developed Condition Hydrology Map**

1. Introduction

This drainage report has been prepared in support of the proposed planning-level processing for the La Jolla View Reservoir (LJVR) project, and in conjunction with the project stormwater requirements. City of San Diego development requirements require hydrology calculations at this project stage, with an analysis of existing and developed conditions. An overall decrease in runoff is anticipated for the project since the total impervious area will be less in developed conditions and since drainage patterns will remain essentially unchanged. Therefore, a detention routing analysis is not necessary to demonstrate that the developed condition 100-year peak flow is below the existing condition level.

2. Project Description

The La Jolla View Reservoir project is located along the northwest end of Encelia Drive in the City of San Diego, California (see Figure 1 below for project location). The project proposes to demolish the existing 0.7 million gallon (MG) reservoir tank and access road (Encelia Drive), and construct a new underground 3.1 MG reservoir tank and access road (Encelia Drive). New water and electrical utilities are also included as part of the project. The proposed site will be regraded to match existing topography and all pervious areas will be restored to native vegetation.

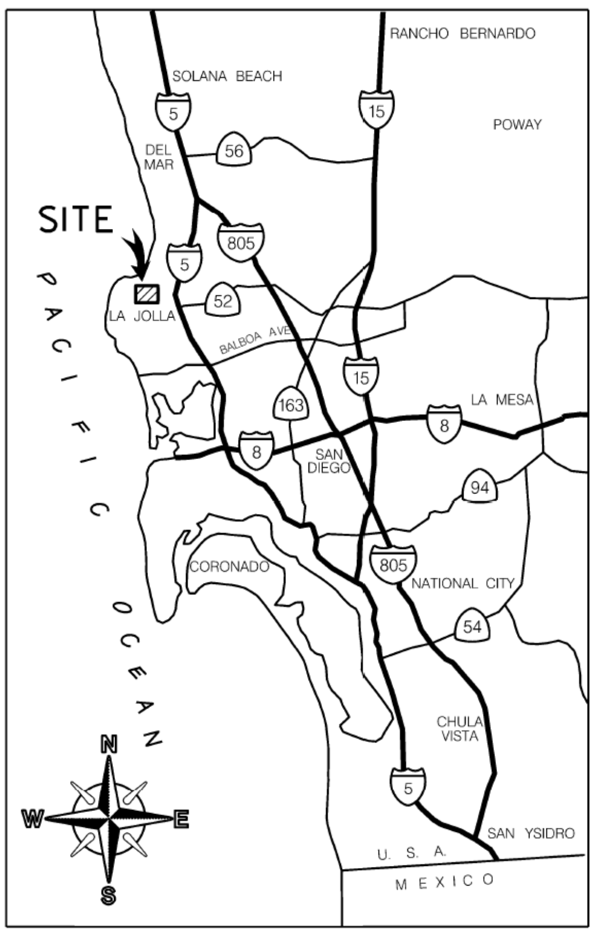


Figure 1: Vicinity Map

3. Drainage Patterns and Hydrologic Methodology

The existing site consists of the above ground reservoir tank and paved access road (Encelia Drive). The remaining area is primarily natural open space with some residential area around the perimeter of the drainage boundaries (see Appendix C Existing Condition Hydrology Map). There is limited run-on from the adjacent properties or streets, as the majority of offsite flow is conveyed around the project's drainage boundaries by Brodiaea Way, Romero Drive, and Country Club Drive. The project site was divided into two basins, Basin 100 (denoted by the 100 series nodes) and Basin 200 (denoted by the 200 series nodes). Runoff from both basins generally sheet flows west and is concentrated into a system of small gullies and ravines. There is no other drainage infrastructure onsite. The natural channels that leave Basin 100 and Basin 200 eventually confluence to the west of the project site and drain to the culvert under Soledad Avenue. From Soledad Avenue, flow is conveyed via open channel and pipe to Torrey Pines Road, where it passes underneath the road in a culvert before eventually discharging into the ocean.

In proposed conditions, site drainage patterns will remain generally unchanged because the intent of the proposed grading is to restore the area to existing grades. After removal of more than half the access road and the reservoir tank, the total impervious area will be less than existing conditions. All regraded pervious areas will be vegetated with Southern Maritime Chaparral per the project's landscape restoration plan. Runoff from the proposed impervious access road will be conveyed via swales and/or gutters. No other stormwater drainage infrastructure is proposed onsite.

Rational Method hydrologic calculations are provided for the existing and proposed condition using the City of San Diego Drainage Design Manual. 100-year flows were calculated using the AES Rational Method software based on the design storm rainfall and estimated runoff coefficients (see Appendices A and B). The Rational Method calculations are reflected on the hydrology maps in Appendix C, with corresponding drainage boundaries, initial subareas, and discharge points illustrated.

4. Summary and Conclusions

The proposed La Jolla View Reservoir project, as designed, will not substantially alter the existing drainage pattern. The total overall peak flowrate will not increase from pre- to post-project condition; therefore runoff from the proposed project will not exceed the capacity of the downstream storm drain system. A summary of existing and proposed conditions runoff is provided in Table 1 and Table 2. The total project site drainage area increases by approximately 0.5 acres in proposed conditions as a result of regrading along the redeveloped portion of Encelia Drive, which diverts a relatively small amount of area away from the ravine that is northeast of the project site. The area diversion is inconsequential because it represents less than 4% of the total existing condition drainage area, and the total impervious area is reduced in proposed conditions.

Table 1: Existing Condition Runoff Table

Location	Area (ac)[1]	Runoff Coeff. C[2]	Tc[3] (min)	Intensity I[4] (in/hr)	Q_{100}[5] (cfs)
POC-1 (Basin 100)	3.6	0.45	7.7	3.8	6.1
POC-2 (Basin 200)	9.9	0.46	6.0	4.2	18.9
TOTAL	13.5				25.0

Table 2: Proposed Condition Runoff Table

Location	Area (ac)[1]	Runoff Coeff. C[2]	Tc[3] (min)	Intensity I[4] (in/hr)	Q_{100}[5] (cfs)
POC-1 (Basin 100)	4.3	0.45	11.2	3.3	6.4
POC-2 (Basin 200)	9.7	0.46	6.0	4.2	18.5
TOTAL	14.0				24.9

[1]Total tributary area to Point of Compliance (POC).
[2]Area-average runoff coefficient (see AES Rational Method output in Appendix B).
[3]Rational Method Time of Concentration, calculated per the City of San Diego Drainage Design Manual, Appendix A (for supporting calculations see AES Rational Method output provided in Appendix B of this study).
[4]Rational Method peak rainfall intensity in inches/hour (see AES Rational Method output in Appendix B).
[5]Rational Method 100-year Peak Flow at POC (see AES Rational Method output in Appendix B).

Additional impacts to streams or rivers are not anticipated for this project. This is because there are no streams or rivers running through or immediately around the project site, and proposed onsite runoff is less than existing levels. Therefore, the project will not result in any on- or off-site erosion, siltation, or flooding.

Based on topography, FEMA, and County of San Diego floodplain maps, the project site is not located near a 100-year flood hazard area boundary. No housing is proposed within a 100-year flood hazard area, and no structures are proposed within a 100-year flood hazard area which would impede or redirect flood flows. Furthermore, the project will not expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam, as there are no levees or dams impacted by the project site. It is important to note that instead of an above-ground dam and reservoir, the project proposes a 3.1 MG underground reinforced concrete tank and an 18-inch emergency overflow pipe that discharges to the channel within Basin 100 (POC-1).

5. DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

_______________________________ April 10, 2019 _______________________

TORY R. WALKER, R.C.E. 45005 DATE

Appendix A

Figures and Nomographs

NOAA Atlas 14, Volume 6, Version 2
Location name: La Jolla, California, USA*
Latitude: 32.8434°, Longitude: -117.26°
Elevation: 603.21 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

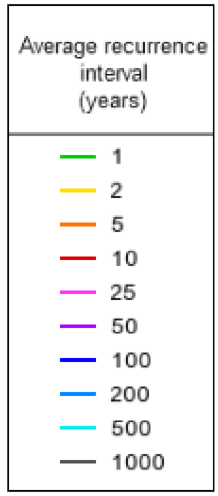
Duration	Average recurrence interval (years)									
	1	**2**	**5**	**10**	**25**	**50**	**100**	**200**	**500**	**1000**
5-min	**0.113** (0.095-0.136)	**0.141** (0.118-0.171)	**0.179** (0.149-0.217)	**0.210** (0.174-0.256)	**0.253** (0.202-0.320)	**0.286** (0.223-0.370)	**0.320** (0.244-0.425)	**0.356** (0.263-0.486)	**0.405** (0.287-0.578)	**0.444** (0.303-0.656)
10-min	**0.162** (0.136-0.195)	**0.203** (0.170-0.245)	**0.257** (0.214-0.311)	**0.301** (0.249-0.368)	**0.362** (0.289-0.458)	**0.410** (0.320-0.530)	**0.459** (0.349-0.609)	**0.510** (0.377-0.697)	**0.580** (0.411-0.828)	**0.636** (0.434-0.940)
15-min	**0.196** (0.164-0.236)	**0.245** (0.205-0.296)	**0.310** (0.259-0.376)	**0.364** (0.301-0.445)	**0.438** (0.350-0.554)	**0.496** (0.387-0.641)	**0.555** (0.423-0.736)	**0.617** (0.456-0.842)	**0.702** (0.497-1.00)	**0.769** (0.525-1.14)
30-min	**0.273** (0.228-0.329)	**0.341** (0.285-0.412)	**0.431** (0.360-0.522)	**0.506** (0.419-0.618)	**0.609** (0.486-0.770)	**0.689** (0.538-0.891)	**0.772** (0.588-1.02)	**0.858** (0.634-1.17)	**0.976** (0.691-1.39)	**1.07** (0.731-1.58)
60-min	**0.388** (0.325-0.467)	**0.485** (0.405-0.585)	**0.613** (0.512-0.743)	**0.720** (0.595-0.879)	**0.866** (0.691-1.10)	**0.980** (0.765-1.27)	**1.10** (0.835-1.46)	**1.22** (0.902-1.67)	**1.39** (0.983-1.98)	**1.52** (1.04-2.25)
2-hr	**0.541** (0.453-0.652)	**0.666** (0.557-0.804)	**0.831** (0.693-1.01)	**0.967** (0.799-1.18)	**1.15** (0.921-1.46)	**1.30** (1.01-1.68)	**1.45** (1.10-1.92)	**1.60** (1.19-2.19)	**1.82** (1.29-2.59)	**1.98** (1.36-2.93)
3-hr	**0.651** (0.545-0.785)	**0.799** (0.668-0.964)	**0.993** (0.829-1.20)	**1.15** (0.953-1.41)	**1.37** (1.10-1.73)	**1.54** (1.20-1.99)	**1.71** (1.30-2.27)	**1.89** (1.40-2.58)	**2.14** (1.51-3.05)	**2.33** (1.59-3.44)
6-hr	**0.881** (0.738-1.06)	**1.08** (0.907-1.31)	**1.35** (1.13-1.63)	**1.56** (1.29-1.91)	**1.85** (1.48-2.34)	**2.07** (1.62-2.68)	**2.30** (1.75-3.04)	**2.52** (1.87-3.45)	**2.83** (2.01-4.04)	**3.07** (2.10-4.54)
12-hr	**1.17** (0.977-1.41)	**1.46** (1.22-1.76)	**1.82** (1.52-2.21)	**2.12** (1.75-2.59)	**2.50** (2.00-3.17)	**2.79** (2.18-3.61)	**3.08** (2.35-4.09)	**3.37** (2.49-4.60)	**3.75** (2.66-5.35)	**4.04** (2.76-5.98)
24-hr	**1.45** (1.28-1.69)	**1.85** (1.62-2.15)	**2.34** (2.04-2.72)	**2.72** (2.36-3.20)	**3.22** (2.71-3.90)	**3.58** (2.96-4.42)	**3.94** (3.18-4.97)	**4.29** (3.38-5.56)	**4.75** (3.60-6.40)	**5.10** (3.74-7.08)
2-day	**1.79** (1.57-2.08)	**2.29** (2.01-2.66)	**2.91** (2.54-3.39)	**3.39** (2.94-3.98)	**4.01** (3.38-4.86)	**4.47** (3.69-5.52)	**4.91** (3.97-6.20)	**5.35** (4.22-6.94)	**5.92** (4.49-7.98)	**6.35** (4.66-8.82)
3-day	**2.01** (1.77-2.34)	**2.57** (2.26-2.99)	**3.28** (2.87-3.82)	**3.82** (3.32-4.49)	**4.53** (3.82-5.49)	**5.05** (4.18-6.24)	**5.56** (4.49-7.02)	**6.07** (4.78-7.86)	**6.72** (5.09-9.05)	**7.20** (5.29-10.0)
4-day	**2.18** (1.91-2.53)	**2.80** (2.46-3.26)	**3.58** (3.13-4.18)	**4.19** (3.64-4.92)	**4.97** (4.19-6.03)	**5.55** (4.59-6.86)	**6.12** (4.94-7.73)	**6.68** (5.26-8.66)	**7.41** (5.61-9.97)	**7.95** (5.83-11.0)
7-day	**2.56** (2.25-2.98)	**3.37** (2.95-3.92)	**4.37** (3.82-5.09)	**5.15** (4.47-6.06)	**6.18** (5.20-7.48)	**6.93** (5.73-8.56)	**7.67** (6.20-9.69)	**8.41** (6.62-10.9)	**9.37** (7.10-12.6)	**10.1** (7.41-14.0)
10-day	**2.86** (2.51-3.32)	**3.80** (3.33-4.42)	**4.99** (4.36-5.82)	**5.92** (5.14-6.96)	**7.15** (6.02-8.66)	**8.05** (6.65-9.94)	**8.95** (7.23-11.3)	**9.84** (7.75-12.8)	**11.0** (8.34-14.8)	**11.9** (8.73-16.5)
20-day	**3.37** (2.96-3.92)	**4.57** (4.00-5.31)	**6.08** (5.32-7.10)	**7.29** (6.33-8.56)	**8.88** (7.48-10.8)	**10.1** (8.32-12.4)	**11.3** (9.09-14.2)	**12.4** (9.80-16.1)	**14.0** (10.6-18.9)	**15.2** (11.2-21.2)
30-day	**4.01** (3.52-4.66)	**5.44** (4.77-6.33)	**7.28** (6.36-8.49)	**8.74** (7.59-10.3)	**10.7** (9.00-12.9)	**12.2** (10.0-15.0)	**13.6** (11.0-17.2)	**15.1** (11.9-19.6)	**17.1** (13.0-23.0)	**18.6** (13.7-25.9)
45-day	**4.68** (4.11-5.44)	**6.34** (5.56-7.38)	**8.48** (7.42-9.89)	**10.2** (8.86-12.0)	**12.5** (10.5-15.2)	**14.3** (11.8-17.6)	**16.0** (12.9-20.2)	**17.8** (14.0-23.1)	**20.3** (15.4-27.3)	**22.2** (16.3-30.8)
60-day	**5.41** (4.75-6.29)	**7.26** (6.36-8.44)	**9.65** (8.45-11.3)	**11.6** (10.1-13.6)	**14.2** (12.0-17.2)	**16.2** (13.4-20.0)	**18.3** (14.8-23.1)	**20.4** (16.0-26.4)	**23.2** (17.6-31.3)	**25.4** (18.7-35.4)

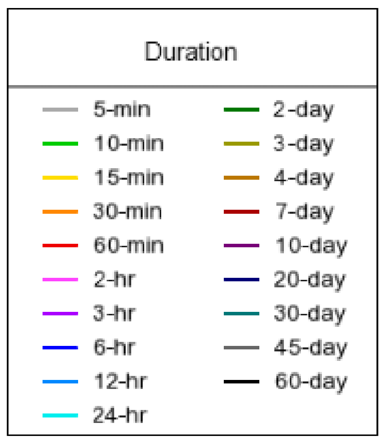
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

curve plots

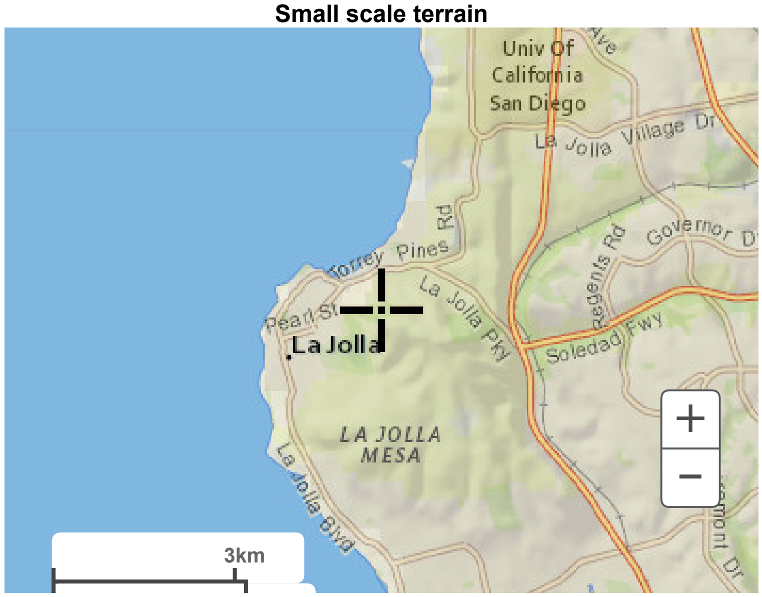




Back to Top

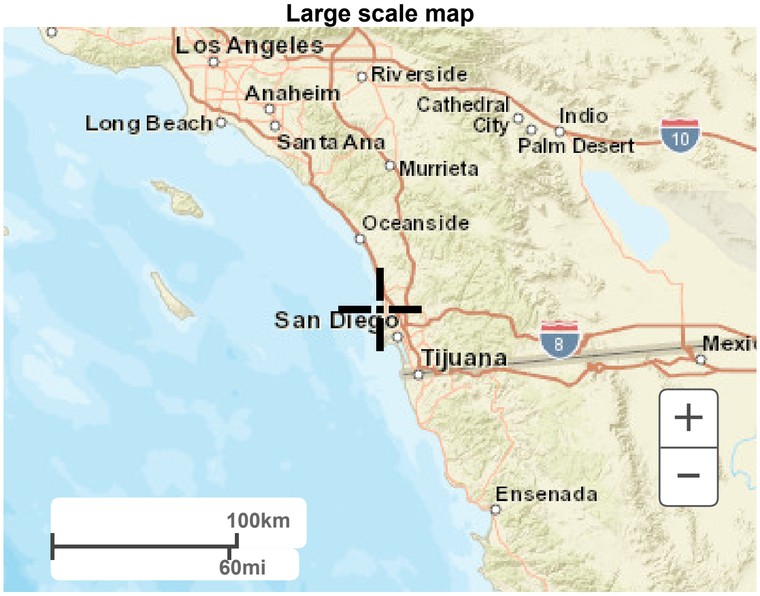
Maps & aerials

Small scale terrain

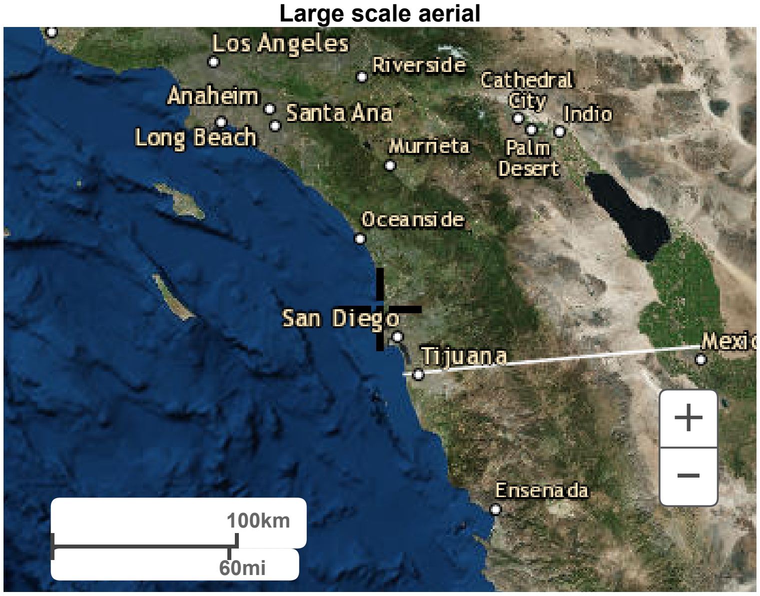


Large scale terrain

Large scale map



Large scale aerial



Back to Top

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

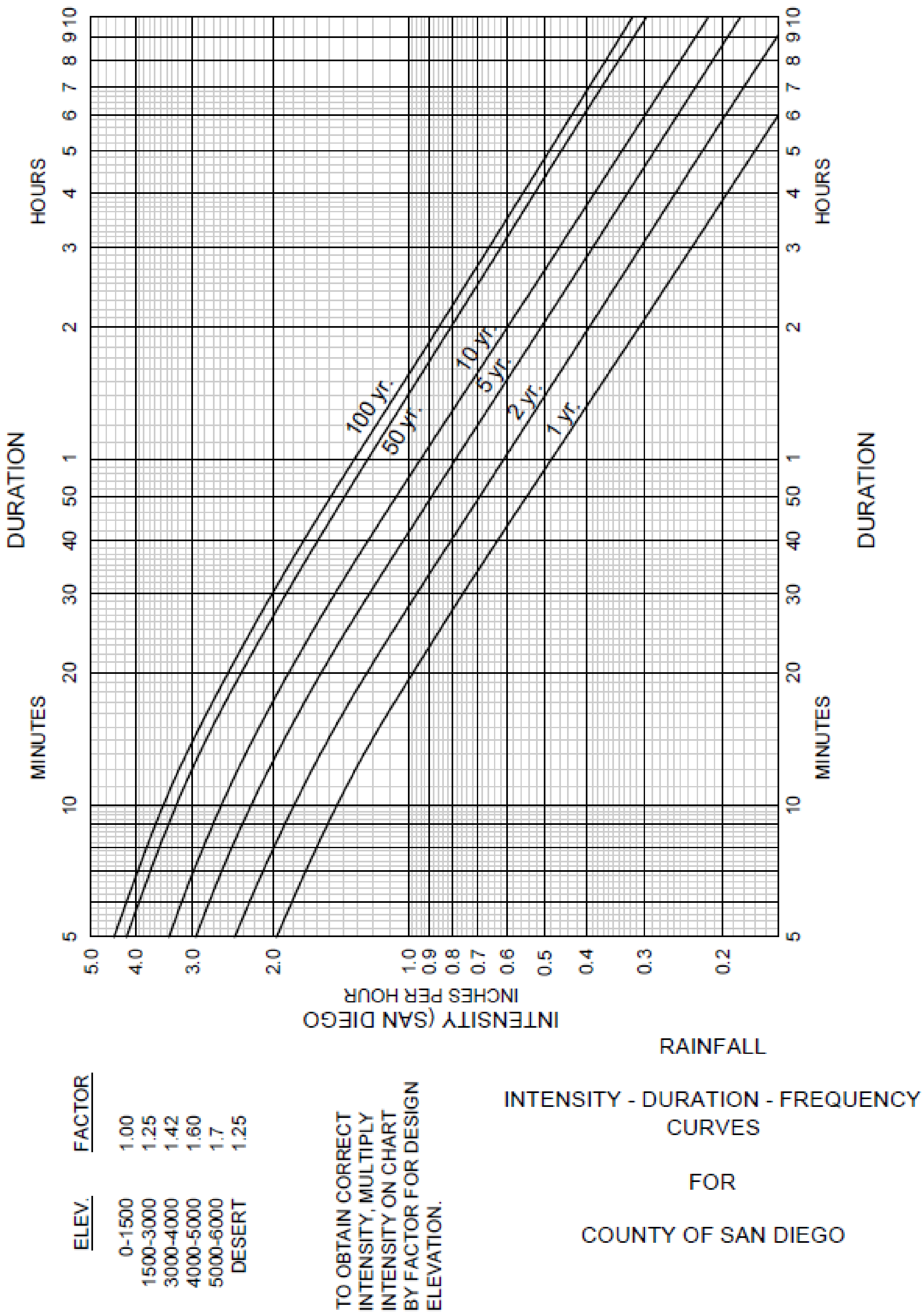
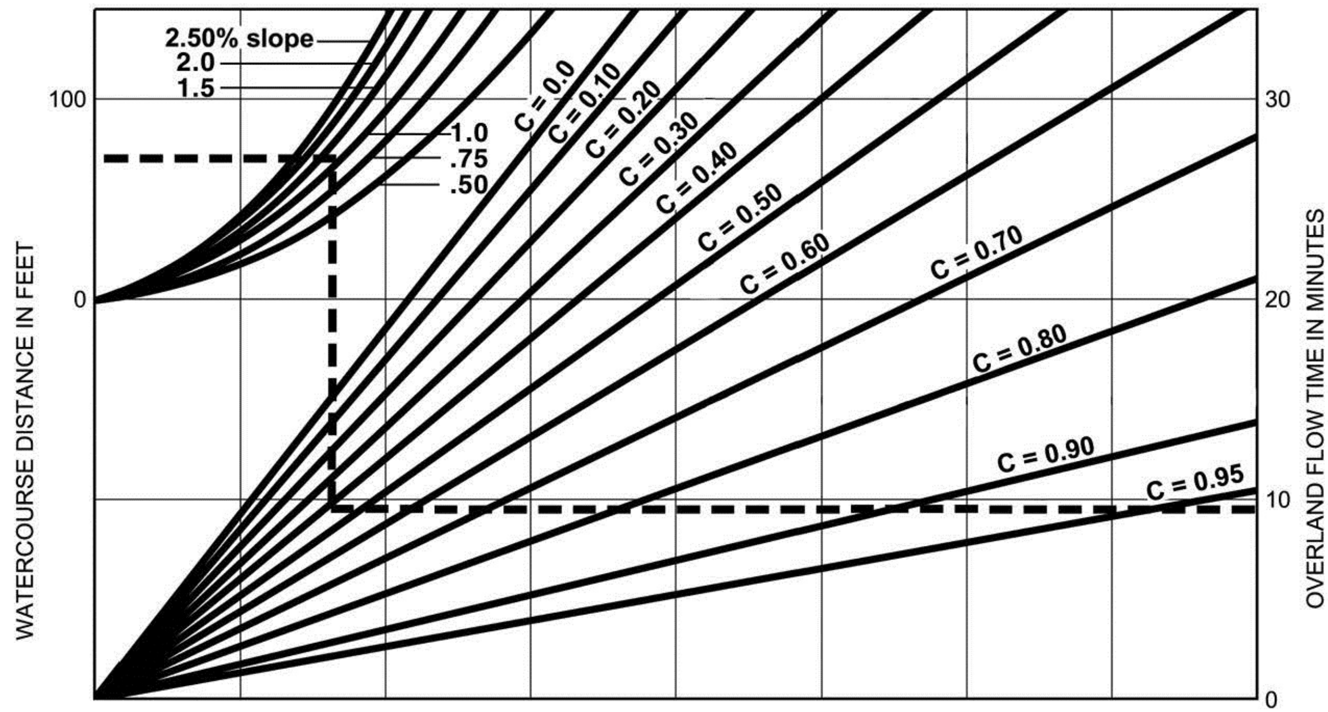


Figure A-1. Intensity-Duration-Frequency Design Chart



EXAMPLE:

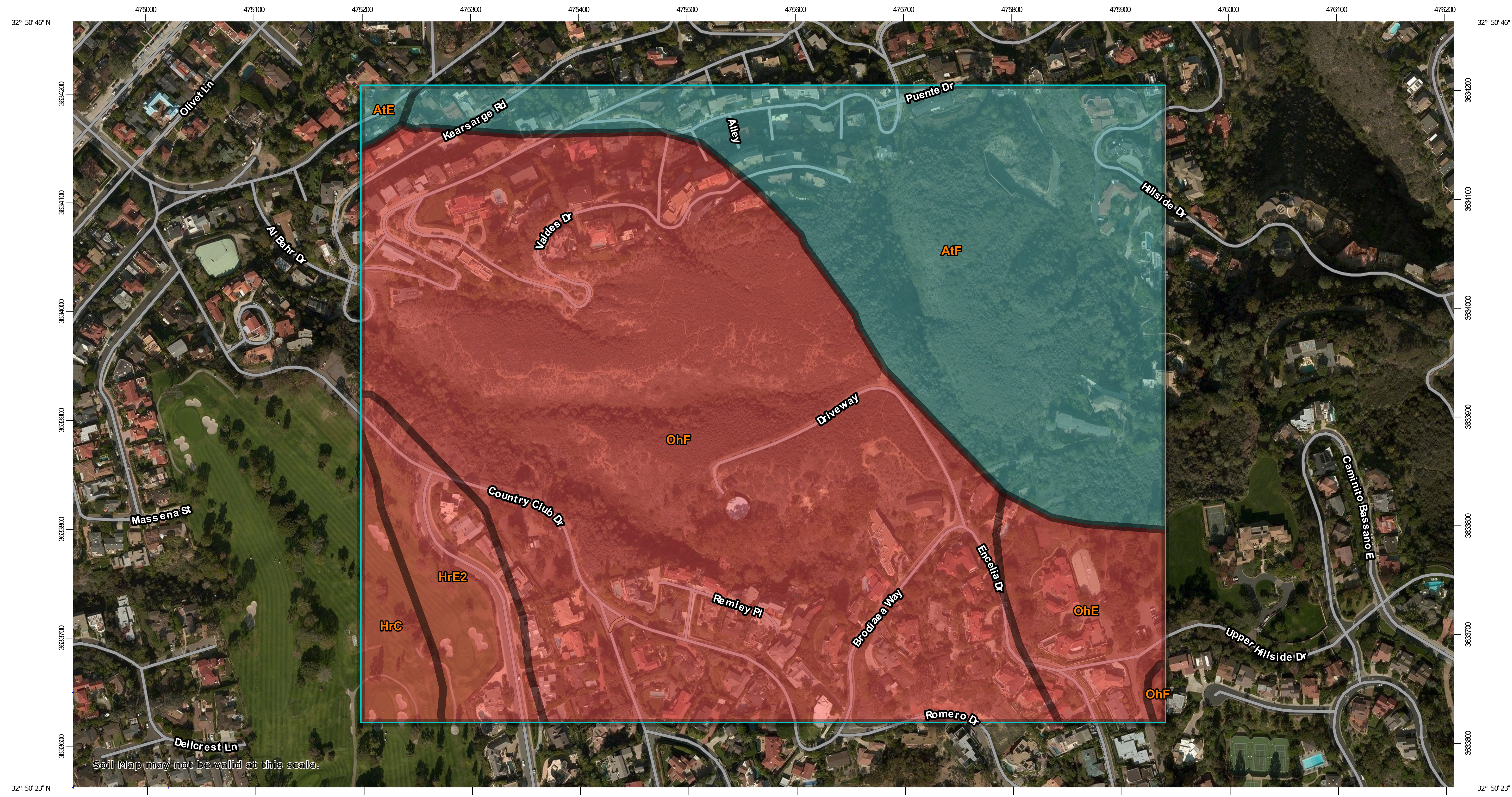
Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Figure A-4. Rational Formula – Overland Time of Flow Nomograph

Note: Use formula for watercourse distances in excess of 100 feet.



Map Scale: 1:3,440 if printed on B landscape (17" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 150, 300, 600, 900

N

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

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

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtE	Altamont clay, 15 to 30 percent slopes, warm MAAT, MLRA 20	C	0.5	0.5%
AtF	Altamont clay, 30 to 50 percent slopes, warm MAAT, MLRA 20	C	32.3	29.9%
HrC	Huerhuero loam, 2 to 9 percent slopes	D	2.8	2.6%
HrE2	Huerhuero loam, 15 to 30 percent slopes, eroded	D	5.9	5.5%
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes	D	6.2	5.7%
OhF	Olivenhain cobbly loam, 30 to 50 percent slopes	D	60.3	55.8%
Totals for Area of Interest			**107.9**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

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.

A.1.3. Rainfall Intensity

The rainfall intensity (I) is the rainfall in inches per hour (in/hr.) for a duration equal to the T_C for a selected storm frequency. Once a particular storm frequency has been selected for design and a T_C calculated for the drainage area, the rainfall intensity can be determined from the Intensity-Duration-Frequency Design Chart (Figure A-1).

Appendix B

Rational Method Calculations (Q100)

RATIONAL METHOD HYDROLOGY DATA SHEET

Project Name: La Jolla View Reservoir
Date: 11/14/2018
Description: Existing Conditions (CEQA Drainage Study)
Drawing Path: X:\Projects2\022 (Helix Enviornmental Planning, Inc.)\11 (SD PWD Enviro Planning)\01 La Jolla View Reservoir\04 ACAD\hydrology-map-exist_LVR.dwg

Job#: 022-11-01

U/S NODE	D/S NODE	AES CODE	U/S ELEV	D/S ELEV	LENGTH (feet)	LAND USE	Imperv. Area (sf)	%Imperv		C coeff*	AREA (acres)
100.0	101.0	2	632.0	608.0	115	Rural	668	19.8%		0.45	0.08
101.0	102.0	5	608.0	579.0	176	Rural	2653	13.3%		0.45	0.46
102.0	103.0	5	579.0	529.0	95	Rural					
103.0	103.0	8				Rural	79	0.4%		0.45	0.49
103.0	104.0	5	529.0	453.0	265	Rural	3219	2.9%		0.45	2.53
200.0	201.0	2	653.0	652.0	80	Rural	4169	88.8%		0.95	0.11
201.0	202.0	5	652.0	612.0	209	Rural	3053	12.8%		0.45	0.55
202.0	203.0	5	612.0	470.0	425	Rural	24146	16.0%		0.45	3.46
203.0	204.0	5	470.0	346.0	760	Rural	26044	10.4%		0.45	5.74

*Note: The runoff coefficient C was selected based on the % Impervious and the closest applicable Land Use from Table A-1 of the City of San Diego Drainage Design Manual. The Rural Land Use with C = 0.45 from Table A-1 was selected for most subareas. For the subarea with % Impervious = 88.8%, a C = 0.95 was selected, as this corresponds well to the 90% Impervious Industrial Land Use in Table A-1.

RATIONAL METHOD HYDROLOGY DATA SHEET

Project Name: La Jolla View Reservoir
Date: 11/14/2018
Description: Proposed Conditions (CEQA Drainage Study)
Drawing Path: X:\Projects2\022 (Helix Enviornmental Planning, Inc.)\11 (SD PWD Enviro Planning)\01 La Jolla View Reservoir\04 ACAD\hydrology-map-prop_LVR.dwg

Job#: 022-11-01

U/S NODE	D/S NODE	AES CODE	U/S ELEV	D/S ELEV	LENGTH (feet)	LAND USE	Imperv. Area (sf)	%Imperv		C coeff*	AREA (acres)
100.0	101.0	2	648.0	632.0	106	Rural	0	0.0%		0.45	0.17
101.0	102.0	5	632.0	625.0	29	Rural	-				
102.0	103.0	5	625.0	599.3	198	Rural	2939	15.3%		0.45	0.44
103.0	104.0	5	599.3	599.2	25	Rural	1332	37.9%		0.45	0.08
104.0	105.0	5	599.2	598.5	111	Rural	1603	11.8%		0.45	0.31
105.0	106.0	5	598.5	529.0	184	Rural	845	2.8%		0.45	0.69
106.0	107.0	5	529.0	453.0	261	Rural	0	0.0%		0.45	2.65
200.0	201.0	2	653.0	652.0	80	Rural	4169	88.8%		0.95	0.11
201.0	202.0	5	652.0	612.0	209	Rural	3053	12.8%		0.45	0.55
202.0	203.0	5	612.0	470.0	425	Rural	24146	16.0%		0.45	3.46
203.0	204.0	5	470.0	346.0	760	Rural	10100	4.2%		0.45	5.54

*Note: The runoff coefficient C was selected based on the % Impervious and the closest applicable Land Use from Table A-1
of the City of San Diego Drainage Design Manual. The Rural Land Use with C = 0.45 from Table A-1 was selected for most subareas.
For the subarea with % Impervious = 88.8%, a C = 0.95 was selected, as this corresponds well to the 90% Impervious Industrial Land Use in Table A-1.

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1532

                           Analysis prepared by:

                         Tory R. Walker Engineering



 ************************** DESCRIPTION OF STUDY **************************
* EXISTING CONDITION (100-YR)                                              *
* La Jolla View Reservoir, San Diego, CA                                   *
*                                                                          *
 **************************************************************************

  FILE NAME: LJ-EX100.DAT
  TIME/DATE OF STUDY: 14:48 11/09/2018
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  8
   1)   5.000;  4.400
   2)   6.000;  4.200
   3)   7.000;  3.900
   4)   8.000;  3.750
   5)   9.000;  3.600
   6)  10.000;  3.450
   7)  12.000;  3.200
   8)  15.000;  2.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0160

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   115.00
 UPSTREAM ELEVATION(FEET) =    632.00
 DOWNSTREAM ELEVATION(FEET) =    608.00
 ELEVATION DIFFERENCE(FEET) =     24.00
 URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.431
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.314
 SUBAREA RUNOFF(CFS) =      0.16
 TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    608.00  DOWNSTREAM(FEET) =    579.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   176.00   CHANNEL SLOPE =  0.1648
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.016   MAXIMUM DEPTH(FEET) =   0.30
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.115
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.58
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.44
 AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   0.85
 Tc(MIN.) =    6.28
 SUBAREA AREA(ACRES) =     0.46       SUBAREA RUNOFF(CFS) =    0.85
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
 TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       1.00

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   3.91
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     291.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    579.00  DOWNSTREAM(FEET) =    529.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =    95.00   CHANNEL SLOPE =  0.5263
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
 MANNING'S FACTOR = 0.080   MAXIMUM DEPTH(FEET) =   1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =       1.00
 FLOW VELOCITY(FEET/SEC.) =   2.83   FLOW DEPTH(FEET) =   0.19
 TRAVEL TIME(MIN.) =   0.56   Tc(MIN.) =    6.84
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     386.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.947
 *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500
  SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    0.87
  TOTAL AREA(ACRES) =        1.0   TOTAL RUNOFF(CFS) =       1.83
  TC(MIN.) =    6.84

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    529.00  DOWNSTREAM(FEET) =    453.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.2868
  CHANNEL BASE(FEET) =    0.50   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.803
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.49
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   0.80
  Tc(MIN.) =    7.65
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    4.33
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  TOTAL AREA(ACRES) =        3.6         PEAK FLOW RATE(CFS) =       6.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   6.14
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     651.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    653.00
  DOWNSTREAM ELEVATION(FEET) =    652.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.153
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    73.75
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    652.00  DOWNSTREAM(FEET) =    612.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   209.00   CHANNEL SLOPE =  0.1914
```

```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.56
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   0.63
  Tc(MIN.) =    2.78
  SUBAREA AREA(ACRES) =     0.55       SUBAREA RUNOFF(CFS) =    1.09
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.533
  TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     289.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    612.00  DOWNSTREAM(FEET) =    470.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   425.00   CHANNEL SLOPE =  0.3341
  CHANNEL BASE(FEET) =    0.50   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.15
  Tc(MIN.) =    3.92
  SUBAREA AREA(ACRES) =     3.46       SUBAREA RUNOFF(CFS) =    6.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.463
  TOTAL AREA(ACRES) =        4.1         PEAK FLOW RATE(CFS) =       8.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   7.01
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     714.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    470.00  DOWNSTREAM(FEET) =    346.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   760.00   CHANNEL SLOPE =  0.1632
  CHANNEL BASE(FEET) =    0.50   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.203
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.14
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   2.06
```

```
 Tc(MIN.) =    5.99
 SUBAREA AREA(ACRES) =     5.74       SUBAREA RUNOFF(CFS) =   10.86
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.456
 TOTAL AREA(ACRES) =        9.9         PEAK FLOW RATE(CFS) =      18.88

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   6.59
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =    1474.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        9.9  TC(MIN.) =      5.99
 PEAK FLOW RATE(CFS)   =      18.88
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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

             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1532

                              Analysis prepared by:

                           Tory R. Walker Engineering



 ************************** DESCRIPTION OF STUDY **************************
* PROPOSED CONDITION POC-1 (100-YR)                                         *
* La Jolla View Reservoir, San Diego, CA                                    *
*                                                                           *
 **************************************************************************

  FILE NAME: LJPR1001.DAT
  TIME/DATE OF STUDY: 15:36 11/09/2018
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  8
   1)   5.000;  4.400
   2)   6.000;  4.200
   3)   7.000;  3.900
   4)   8.000;  3.750
   5)   9.000;  3.600
   6)  10.000;  3.450
   7)  12.000;  3.200
   8)  15.000;  2.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN- / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================= ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0160

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   106.00
  UPSTREAM ELEVATION(FEET) =    648.00
  DOWNSTREAM ELEVATION(FEET) =    632.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.431
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.314
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.00  DOWNSTREAM(FEET) =    625.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    29.00   CHANNEL SLOPE =  0.2414
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   0.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.33
  FLOW VELOCITY(FEET/SEC.) =   2.26   FLOW DEPTH(FEET) =   0.17
  TRAVEL TIME(MIN.) =   0.21   Tc(MIN.) =    5.64
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     135.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    625.00  DOWNSTREAM(FEET) =    599.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   198.00   CHANNEL SLOPE =  0.1298
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.016   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.012
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.36
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =    6.63
  SUBAREA AREA(ACRES) =     0.44       SUBAREA RUNOFF(CFS) =    0.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   4.08
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     333.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    599.30  DOWNSTREAM(FEET) =    599.20
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =    25.00   CHANNEL SLOPE =  0.0040
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.016   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.896
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.17
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.05
 AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   0.40
 Tc(MIN.) =    7.02
 SUBAREA AREA(ACRES) =     0.08       SUBAREA RUNOFF(CFS) =    0.14
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
 TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       1.21

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   1.08
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     358.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    599.20  DOWNSTREAM(FEET) =    598.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =   111.00   CHANNEL SLOPE =  0.0063
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.023   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.620
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.00
 AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   1.84
 Tc(MIN.) =    8.87
 SUBAREA AREA(ACRES) =     0.31       SUBAREA RUNOFF(CFS) =    0.50
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
 TOTAL AREA(ACRES) =        1.0         PEAK FLOW RATE(CFS) =       1.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   1.02
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     469.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    598.50  DOWNSTREAM(FEET) =    529.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   184.00   CHANNEL SLOPE =  0.3777
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.080   MAXIMUM DEPTH(FEET) =   2.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.397
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.16
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.97
 AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   1.55
 Tc(MIN.) =   10.42
```

```
  SUBAREA AREA(ACRES) =     0.69       SUBAREA RUNOFF(CFS) =    1.05
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  TOTAL AREA(ACRES) =        1.7         PEAK FLOW RATE(CFS) =       2.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   2.09
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     653.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    529.00  DOWNSTREAM(FEET) =    453.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   261.00   CHANNEL SLOPE =  0.2912
  CHANNEL BASE(FEET) =    0.50   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.303
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.76
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   0.76
  Tc(MIN.) =   11.18
  SUBAREA AREA(ACRES) =     2.65       SUBAREA RUNOFF(CFS) =    3.94
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.450
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =       6.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   6.23
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =     914.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.3  TC(MIN.) =     11.18
  PEAK FLOW RATE(CFS)   =       6.45
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1532

                           Analysis prepared by:

                        Tory R. Walker Engineering



 ************************** DESCRIPTION OF STUDY **************************
* PROPOSED CONDITION POC-2 (100-YEAR)                                        *
* La Jolla View Reservoir, San Diego, CA                                     *
*                                                                            *
 **************************************************************************

  FILE NAME: LJPR1002.DAT
  TIME/DATE OF STUDY: 16:11 11/09/2018
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  8
   1)   5.000;  4.400
   2)   6.000;  4.200
   3)   7.000;  3.900
   4)   8.000;  3.750
   5)   9.000;  3.600
   6)  10.000;  3.450
   7)  12.000;  3.200
   8)  15.000;  2.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0160

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

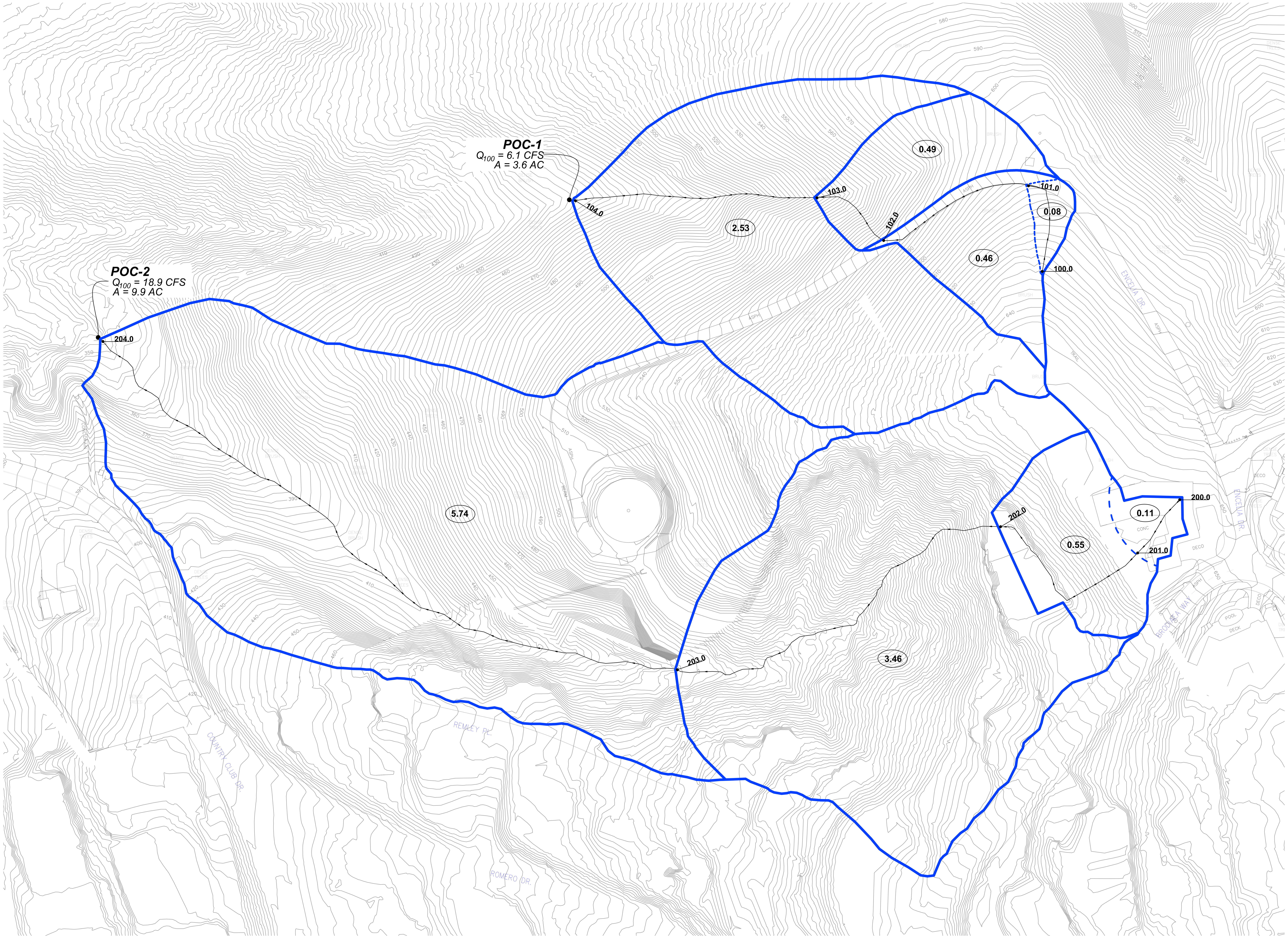
```
  USER-SPECIFIED RUNOFF COEFFICIENT = .9500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    653.00
  DOWNSTREAM ELEVATION(FEET) =    652.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.153
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    73.75
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    652.00  DOWNSTREAM(FEET) =    612.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   209.00   CHANNEL SLOPE =  0.1914
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.56
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   0.63
  Tc(MIN.) =    2.78
  SUBAREA AREA(ACRES) =     0.55       SUBAREA RUNOFF(CFS) =    1.09
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.533
  TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     289.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    612.00  DOWNSTREAM(FEET) =    470.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   425.00   CHANNEL SLOPE =  0.3341
  CHANNEL BASE(FEET) =    0.50   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.15
  Tc(MIN.) =    3.92
  SUBAREA AREA(ACRES) =     3.46       SUBAREA RUNOFF(CFS) =    6.85
```

```
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.463
 TOTAL AREA(ACRES) =        4.1         PEAK FLOW RATE(CFS) =       8.40

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   7.01
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     714.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    470.00  DOWNSTREAM(FEET) =    346.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   760.00   CHANNEL SLOPE =  0.1632
 CHANNEL BASE(FEET) =    0.50   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =   5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.198
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.08
 AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   2.08
 Tc(MIN.) =    6.01
 SUBAREA AREA(ACRES) =     5.54       SUBAREA RUNOFF(CFS) =   10.46
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.456
 TOTAL AREA(ACRES) =        9.7         PEAK FLOW RATE(CFS) =      18.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   6.59
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =    1474.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        9.7  TC(MIN.) =      6.01
 PEAK FLOW RATE(CFS)   =      18.48
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

Appendix C

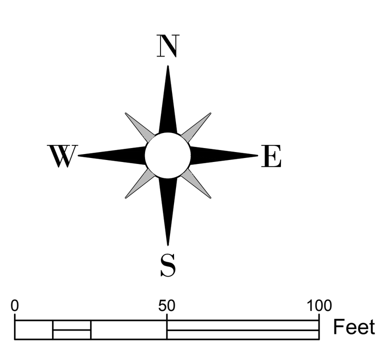
Project Maps

Existing Condition Hydrology Map
Developed Condition Hydrology Map



LEGEND

- SUBAREA BASIN BOUNDARY
- INITIAL AREA BOUNDARY
- FLOW DIRECTION
- 100.0 RATIONAL METHOD NODE
- 0.08 AREA (AC)
- 610 EXISTING CONTOUR



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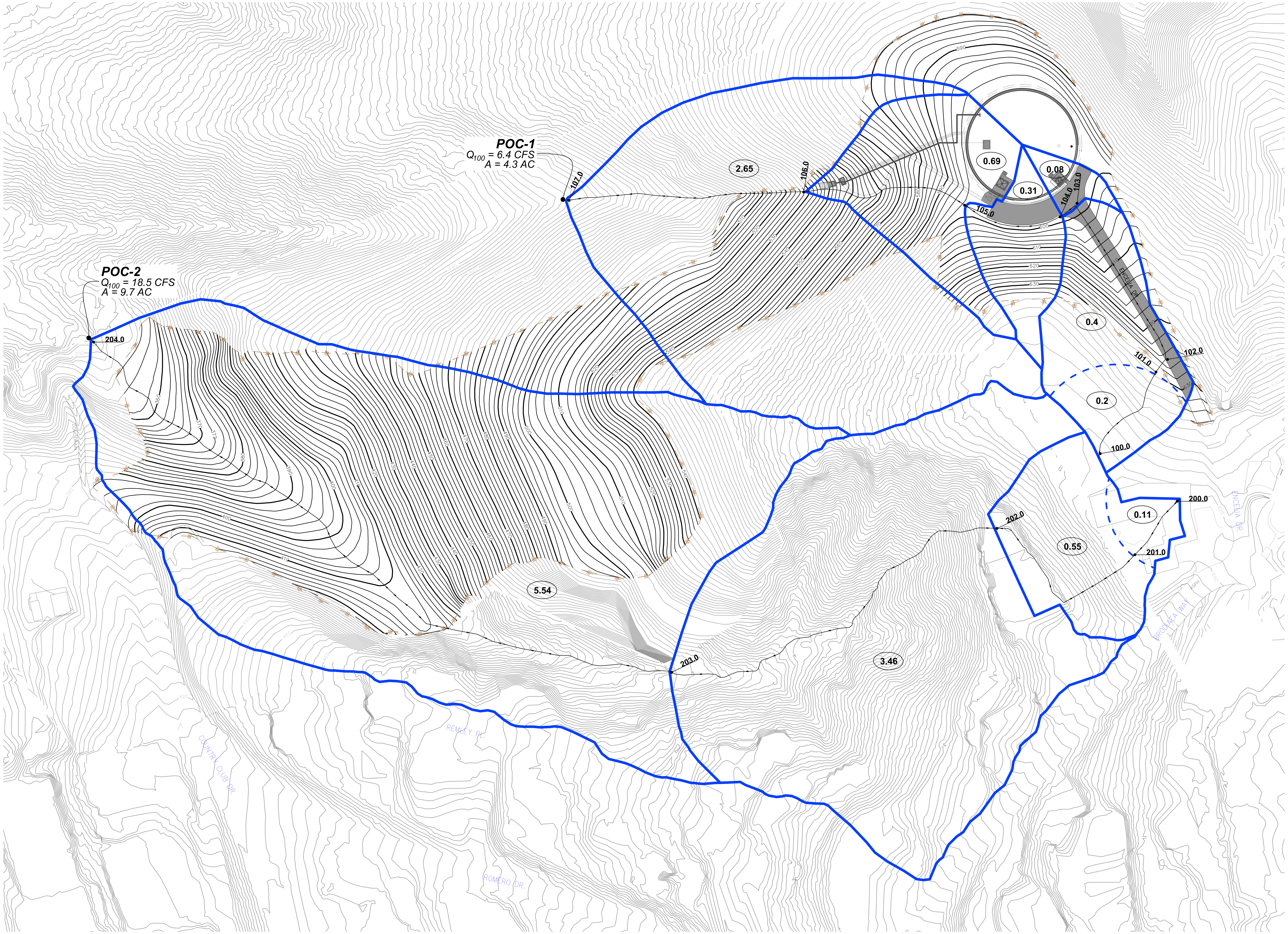
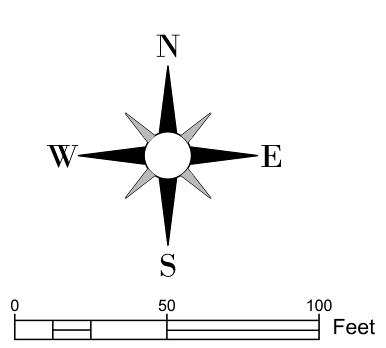
LA JOLLA VIEW RESERVOIR
EXISTING CONDITION HYDROLOGY MAP

X:\Projects2\022 (Helix Enviornmental Planning, Inc.)\11 (SD PWD Enviro Planning)\01 La Jolla View Reservoir\04 ACAD\hydrology-map-exist_LVR.dwg, 3/1/2018 4:53:24 PM





LEGEND

- SUBAREA BASIN BOUNDARY
- INITIAL AREA BOUNDARY
- FLOW DIRECTION
- 100.0 RATIONAL METHOD NODE
- 0.08 AREA (AC)
- LIMIT OF GRADING
- PROPOSED IMPERVIOUS AREA
- 610 PROPOSED CONTOUR
- 610 EXISTING CONTOUR

NOTE:
PROPOSED IMPERVIOUS AREAS ARE SHOWN ON THIS EXHIBIT (SEE LEGEND). ALL OTHER AREAS WITHIN LIMIT OF GRADING ARE VEGETATED WITH SOUTHERN MARITIME CHAPARRAL (SEE LANDSCAPE RESTORATION PLAN FOR DETAIL).

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LA JOLLA VIEW RESERVOIR
PROPOSED CONDITION HYDROLOGY MAP

X:\Projects\2022 (Helix Environmental Planning, Inc)\11 (SD PWD Enviro Planning)\01 La Jolla View Reservoir\04 ACAD\hydrology-map-prop_LVR.dwg