HYDROLOGY REPORT

MONARCH BAY ENTRY

MONARCH BAY DRIVE CORNER EAST PACIFIC COAST HIGHWAY
DANA POINT, CALIFORNIA
A.P.N. 670-131-14 & 670-131-15

PREPARED FOR:
KEYSTONE PACIFIC PROPERTY MANAGEMENT, LLC
16775 VON KARMAN AVENUE
IRVINE, CALIFORNIA 92606
(949) 833-2600

PREPARED BY:
SAXON ENGINEERING, SERVICES, INC.
2605 TEMPLE HEIGHTS DRIVE, SUITE A
OCEANSIDE, CALIFORNIA 92056
(949) 366-2180

INITIAL DATE: *August 24, 2020*
REVISION 1:

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.

8/24/20

KURT M. SAXON
R.C.E. NO. 44180
EXPIRES 6/30/21

DATE

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I. INTRODUCTION/ DISCUSSION

This study was prepared in conjunction with the proposed redevelopment of the Monarch Bay entrance which includes the driveway and drive aisle. The project site is located along the Monarch Bay Drive corner of the East Pacific Coast Highway City of Dana Point. The proposed redevelopment shall comprise of a total of 0.608 acre.

The proposed project shall comprise of the redevelopment of the entrance of the existing residential area. The new guardhouse shall be outfitted with boom barrier along the Monarch Bay Drive entrance while an automatic boom barrier shall be added along the Salt Creek Street adjacent the Monarch Bay Drive. New islands with landscaping are proposed along both Monarch Bay Drive and Salt Creek Street. The redevelopment also improves the parking area in front of the tennis and basketball courts and playground area opposite the said guardhouse. Redevelopment in the area also includes bike racks and an ADA ramp towards the aforementioned activities area.

The existing conditions and the proposed development conditions are to be compared for both runoff flows and volumes. It should be noted that the catchment areas are based on the topography of the project site that extends to boundaries of the actual areas for redevelopment. The flow comparison shall be done for the 25- and 100-year storm events while the volume is based on the comparison for the 100-year storm event. The tables below summarize the calculations for the flows and volumes.

HYDROLOGIC CONDITIONS DETAIL SUMMARY

SUB AREA ID	STAGE	AREA (ACRE)	ELEV DIFF (FT)	FLOW PATH LENGTH (FT)	FLOW PATH SLOPE (VHT/HFT)
X.1	EXISTING CONDITION	0.537	10.53	320.09	0.0329
X.2		0.222	11.15	280.64	0.0397
A.1	PROPOSED CONDITION	0.442	8.89	259.51	0.0343
A.2		0.037	2.71	68.72	0.0394
B.1		0.020	2.58	49.66	0.0512
C.1		0.239	11.21	299.41	0.0374

EXISTING CONDITIONS FLOW AND VOLUME SUMMARY

SUB AREA ID	25-YEAR FLOW (CFS)	100-YEAR FLOWS (CFS)	100-YEAR VOLUME (CF)
X.1	2.079	2.667	967.64
X.2	0.905	1.162	385.20
TOTAL	**2.984**	**3.829**	**1,352.84**

PROPOSED FLOW AND VOLUME SUMMARY

SUB AREA ID	25-YEAR FLOW (CFS)	100-YEAR FLOWS (CFS)	100-YEAR VOLUME (CF)
A.1	1.803	2.315	766.17
A.2	0.208	0.267	80.10
B.1	0.125	0.161	48.30
C.1	0.953	1.224	421.33
TOTAL	**3.089**	**3.967**	**1,352.00**

Flows for Area X.1 drains directly to the East Pacific Coast Highway. The runoff eventually drains to a curb inlet some 0.44 mile to the southeast that connects to the 12x13 reinforced concrete arch, 1-12x14 reinforced concrete box culvert, and 2-10x13 reinforced concrete box culvert. These storm drain lines have an outlet to the Pacific Ocean. Area X.2 drains to along the Salt Lake Street to the said O.C.F.C.D. culverts near the outfall.

The proposed redevelopment shall direct the runoff from Area A.1 to a catch basin on the northwest portion of the project area and Area A.2 drains directly to the E. Pacific Coast Highway. Area B.1 drains to a catch basin on the northeast corner of E. Pacific Coast Highway and the Monarch Bay. Area C.1 drains to a trench drain on the east at Salt Lake Street. The runoff from the catch basins and the trench drain are then directed to an underground infiltration system near the corner of Monarch Bay Drive and Salt Creek Street in the east portion.

The volumes were graphically calculated based on the time of concentration and the peak flow calculated from the Rational Method for each of the subareas. The change in volume for the 100-year storm event for the total project site in the proposed conditions was estimated to be the same with the volume for the existing conditions. This is due to nature of the existing development within the project site is very similar to the proposed redevelopment.

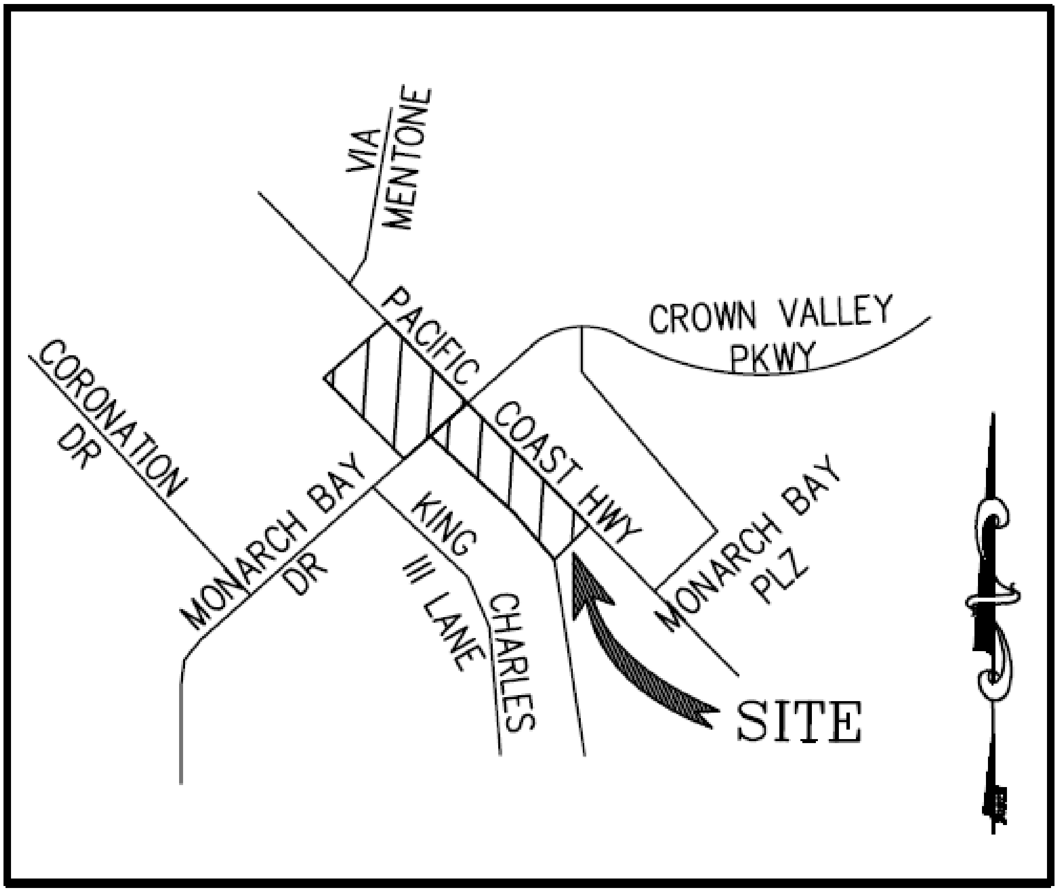
The entire DCV volume for the project site is 1,381 cf. The Stormtech infiltration tank will be able to accommodate 1,598 cf. The provided volume for the water quality management plan will be able to hold the expected 100-year volume.

The catch basin for Area A.1 was sized as 1.5 x 1.5 ft as well as Area A.2 in order to drain the 100-year runoff with a less than 4” ponding depth. The required perimeter for the inlets is 3.0 ft. A 50% clogging criteria was considered in the size of the inlet for the 100-year storm runoff.

CONCLUSION

The systems, as proposed, is capable of containing the expected 100-year runoff volumes while addressing the WQMP volume requirements. The underground volume capacities for the proposed development is more than the required change in volume for the entire site.

II. VICINITY MAP



VICINITY MAP

N.T.S.

III. RATIONAL METHOD CALCULATIONS

United States Department of Agriculture

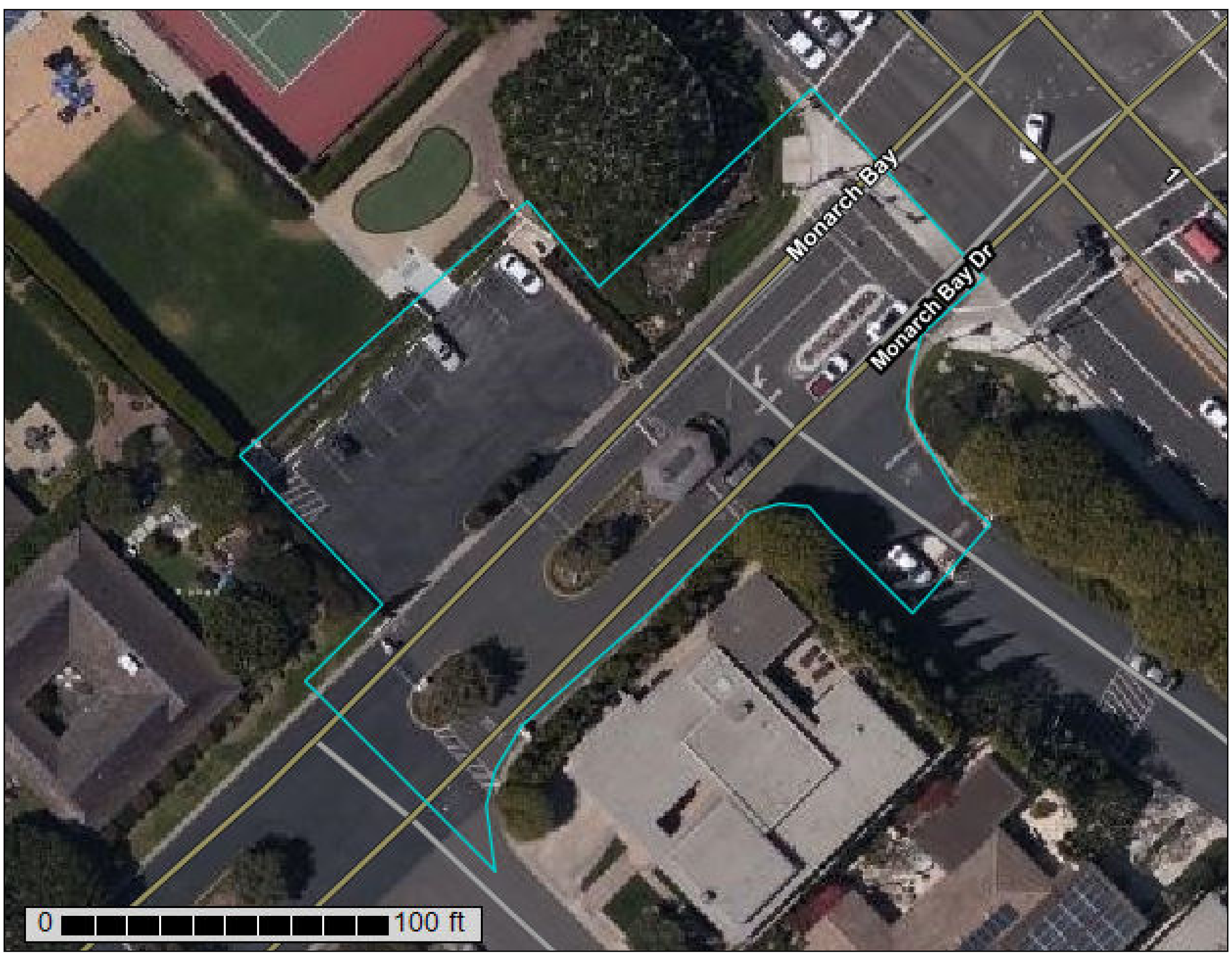
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Orange County and Part of Riverside County, California



July 17, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

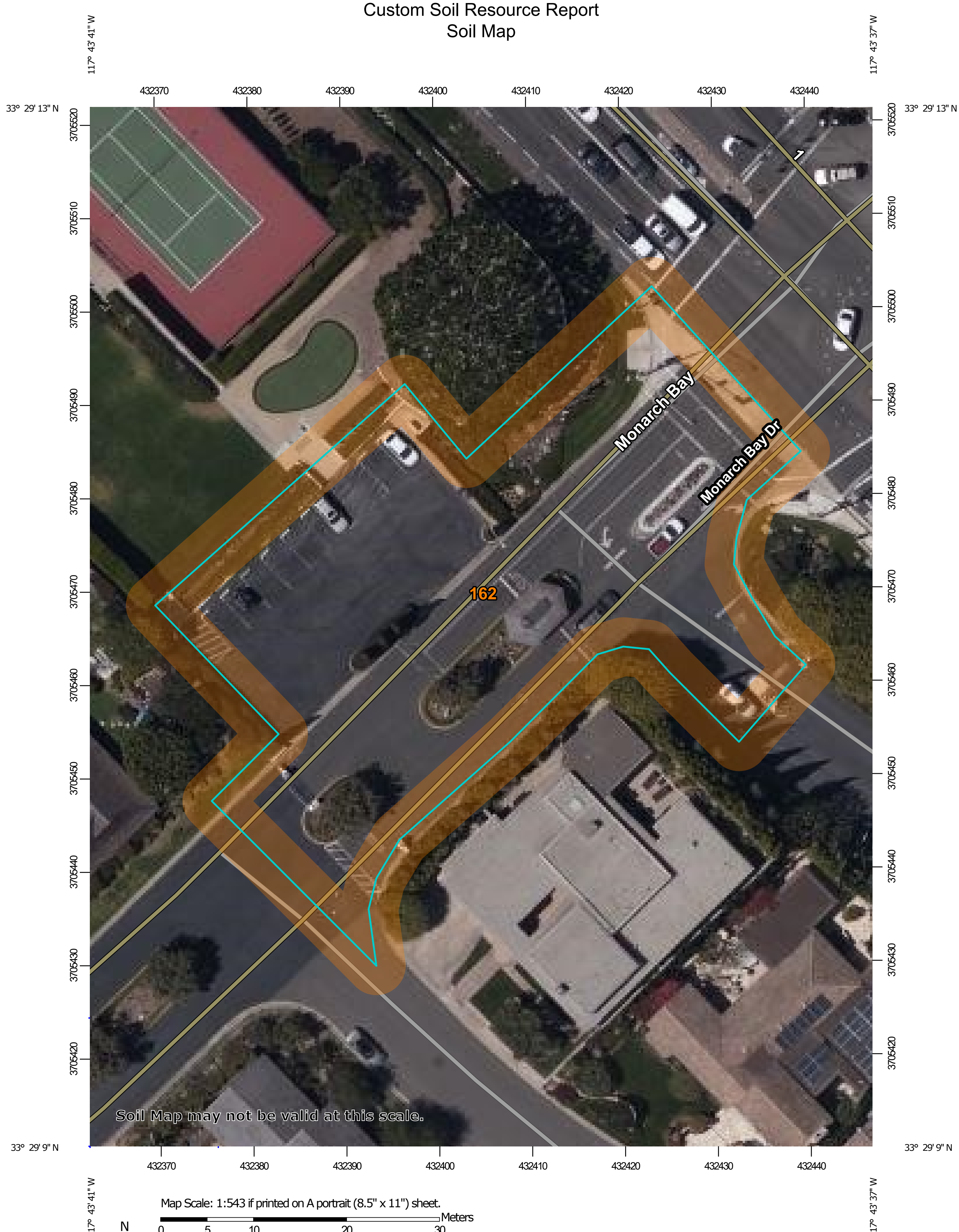
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map



Map Scale: 1:543 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 5, 10, 20, 30

Feet: 0, 25, 50, 100, 150

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 Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Orange County and Part of Riverside County, California
Survey Area Data: Version 14, May 27, 2020

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

Date(s) aerial images were photographed: Apr 11, 2018—May 5, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
162	Marina loamy sand, 2 to 9 percent slopes	0.6	100.0%
Totals for Area of Interest		**0.6**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Orange County and Part of Riverside County, California

162—Marina loamy sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hcn7
Elevation: 0 to 1,330 feet
Mean annual precipitation: 11 to 13 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Marina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marina

Setting

Landform: Dunes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Old eolian sands

Typical profile

H1 - 0 to 33 inches: loamy sand
H2 - 33 to 60 inches: sand, loamy sand, loamy fine sand
H2 - 33 to 60 inches: sand, coarse sand
H2 - 33 to 60 inches:
H3 - 60 to 80 inches:
H3 - 60 to 80 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Marina, less sloping or steeper

Percent of map unit: 10 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 3 percent
Hydric soil rating: No

Myford, sandy loam, thick surface

Percent of map unit: 2 percent
Hydric soil rating: No

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Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/14/20 File Name: X1yr25.roc

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Monarch Bay Entry
Area X.1
Existing Conditions
25-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 25.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

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Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 320.090(Ft.)
Top (of initial area) elevation = 165.390(Ft.)
Bottom (of initial area) elevation = 154.860(Ft.)
Difference in elevation = 10.530(Ft.)
Slope = 0.03290 s(%)= 3.29
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.047 min.
Rainfall intensity = 4.332(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff = 2.079(CFS)
Total initial stream area = 0.537(Ac.)
End of computations, total study area = 0.54 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/14/20 File Name: X2yr25.roc

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Monarch Bay Entry
Area X.2
Existing Conditions
25-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 25.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++
Process from Point/Station 30.000 to Point/Station 40.000
**** INITIAL AREA EVALUATION ****

____

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 280.640(Ft.)
Top (of initial area) elevation = 165.450(Ft.)
Bottom (of initial area) elevation = 154.320(Ft.)
Difference in elevation = 11.130(Ft.)
Slope = 0.03966 s(%)= 3.97
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.527 min.
Rainfall intensity = 4.558(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff = 0.905(CFS)
Total initial stream area = 0.222(Ac.)
End of computations, total study area = 0.22 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: A1yr25.roc

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Monarch Bay Entry
Area A.1
Proposed Conditions
25-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 25.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

+++

Process from Point/Station 50.000 to Point/Station 60.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 259.510(Ft.)
Top (of initial area) elevation = 165.390(Ft.)
Bottom (of initial area) elevation = 156.500(Ft.)
Difference in elevation = 8.890(Ft.)
Slope = 0.03426 s(%)= 3.43
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.516 min.
Rainfall intensity = 4.563(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff = 1.803(CFS)
Total initial stream area = 0.442(Ac.)
End of computations, total study area = 0.44 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: A2yr25.roc

----
Monarch Bay Entry
Area A.2
Proposed Conditions
25-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 25.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++
Process from Point/Station 70.000 to Point/Station 80.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 68.720(Ft.)
Top (of initial area) elevation = 157.570(Ft.)
Bottom (of initial area) elevation = 154.860(Ft.)
Difference in elevation = 2.710(Ft.)
Slope = 0.03944 s(%)= 3.94
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 3.152 min.
Rainfall intensity = 6.264(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.896
Subarea runoff = 0.208(CFS)
Total initial stream area = 0.037(Ac.)
End of computations, total study area = 0.04 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: B1yr25.roc

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Monarch Bay Entry
Area B.1
Proposed Conditions
25-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 25.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++

Process from Point/Station 90.000 to Point/Station 100.000
**** INITIAL AREA EVALUATION ****

____

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 49.660(Ft.)
Top (of initial area) elevation = 157.970(Ft.)
Bottom (of initial area) elevation = 155.390(Ft.)
Difference in elevation = 2.580(Ft.)
Slope = 0.05195 s(%)= 5.20
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 2.619 min.
Rainfall intensity = 6.955(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.896
Subarea runoff = 0.125(CFS)
Total initial stream area = 0.020(Ac.)
End of computations, total study area = 0.02 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: C1yr25.roc

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Monarch Bay Entry
Area C.1
Proposed Conditions
25-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 25.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++
Process from Point/Station 110.000 to Point/Station 120.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 299.410(Ft.)
Top (of initial area) elevation = 165.470(Ft.)
Bottom (of initial area) elevation = 154.260(Ft.)
Difference in elevation = 11.210(Ft.)
Slope = 0.03744 s(%)= 3.74
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.737 min.
Rainfall intensity = 4.462(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff = 0.953(CFS)
Total initial stream area = 0.239(Ac.)
End of computations, total study area = 0.24 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/14/20 File Name: X1yr100.roc
----
Monarch Bay Entry
Area X.1
Existing Conditions
100-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 100.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 320.090(Ft.)
Top (of initial area) elevation = 165.390(Ft.)
Bottom (of initial area) elevation = 154.860(Ft.)
Difference in elevation = 10.530(Ft.)
Slope = 0.03290 s(%)= 3.29
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.047 min.
Rainfall intensity = 5.549(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.895
Subarea runoff = 2.667(CFS)
Total initial stream area = 0.537(Ac.)
End of computations, total study area = 0.54 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/14/20 File Name: X2yr100.roc

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Monarch Bay Entry
Area X.2
Existing Conditions
100-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 100.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++

Process from Point/Station 30.000 to Point/Station 40.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 280.640(Ft.)
Top (of initial area) elevation = 165.470(Ft.)
Bottom (of initial area) elevation = 154.320(Ft.)
Difference in elevation = 11.150(Ft.)
Slope = 0.03973 s(%)= 3.97
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.525 min.
Rainfall intensity = 5.843(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.895
Subarea runoff = 1.162(CFS)
Total initial stream area = 0.222(Ac.)
End of computations, total study area = 0.22 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: A1100yr.roc

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Monarch Bay Entry
Area A.1
Proposed Conditions
100-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 100.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++

Process from Point/Station 50.000 to Point/Station 60.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 259.510(Ft.)
Top (of initial area) elevation = 165.390(Ft.)
Bottom (of initial area) elevation = 156.500(Ft.)
Difference in elevation = 8.890(Ft.)
Slope = 0.03426 s(%)= 3.43
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.516 min.
Rainfall intensity = 5.849(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.895
Subarea runoff = 2.315(CFS)
Total initial stream area = 0.442(Ac.)
End of computations, total study area = 0.44 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: A2yr100.roc

----

Monarch Bay Entry
Area A.2
Proposed Conditions
100-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 100.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++
Process from Point/Station 70.000 to Point/Station 80.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 68.720(Ft.)
Top (of initial area) elevation = 157.570(Ft.)
Bottom (of initial area) elevation = 154.860(Ft.)
Difference in elevation = 2.710(Ft.)
Slope = 0.03944 s(%)= 3.94
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 3.152 min.
Rainfall intensity = 8.060(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.897
Subarea runoff = 0.267(CFS)
Total initial stream area = 0.037(Ac.)
End of computations, total study area = 0.04 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: B1yr100.roc

----

Monarch Bay Entry
Area B.1
Proposed Conditions
100-yr Storm Event

Program License Serial Number 5010

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

Rational hydrology study storm event year is 100.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

++
Process from Point/Station 90.000 to Point/Station 100.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 49.660(Ft.)
Top (of initial area) elevation = 157.970(Ft.)
Bottom (of initial area) elevation = 155.390(Ft.)
Difference in elevation = 2.580(Ft.)
Slope = 0.05195 s(%)= 5.20
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 2.619 min.
Rainfall intensity = 8.962(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.897
Subarea runoff = 0.161(CFS)
Total initial stream area = 0.020(Ac.)
End of computations, total study area = 0.02 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

Orange County Rational Hydrology Program

(Hydrology Manual Date(s) October 1986 & November 1996)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2004 Version 8.0
Rational Hydrology Study, Date: 08/26/20 File Name: C1yr100.roc
----
Monarch Bay Entry
Area C.1
Proposed Conditions
100-yr Storm Events

Program License Serial Number 5010

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

Rational hydrology study storm event year is 100.0

Decimal fraction of study above 2000 ft., 600M = 0.0000
English Units Used for input data

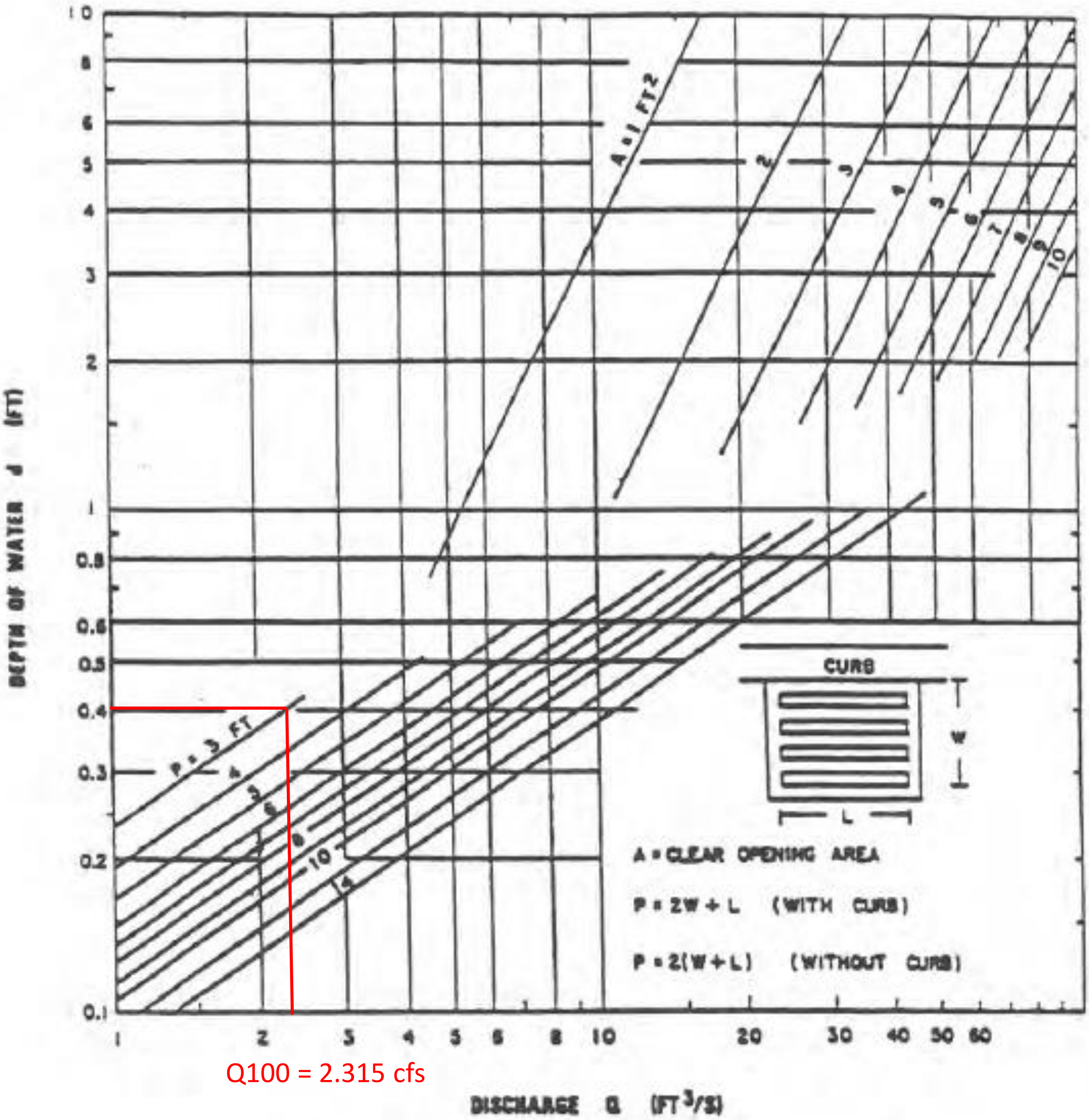
++
Process from Point/Station 110.000 to Point/Station 120.000
**** INITIAL AREA EVALUATION ****

SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fp)= 0.300(In/Hr)
Max Catchment Loss (Fm) = 0.030(In/Hr)
Initial subarea data:
Initial area flow distance = 299.410(Ft.)
Top (of initial area) elevation = 165.470(Ft.)
Bottom (of initial area) elevation = 154.260(Ft.)
Difference in elevation = 11.210(Ft.)
Slope = 0.03744 s(%)= 3.74
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.737 min.
Rainfall intensity = 5.718(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.895
Subarea runoff = 1.224(CFS)
Total initial stream area = 0.239(Ac.)
End of computations, total study area = 0.24 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number (AMC 2) = 56.0

IV. ORANGE COUNTY HYDROLOGY MANUAL CHARTS AND TABLES USED

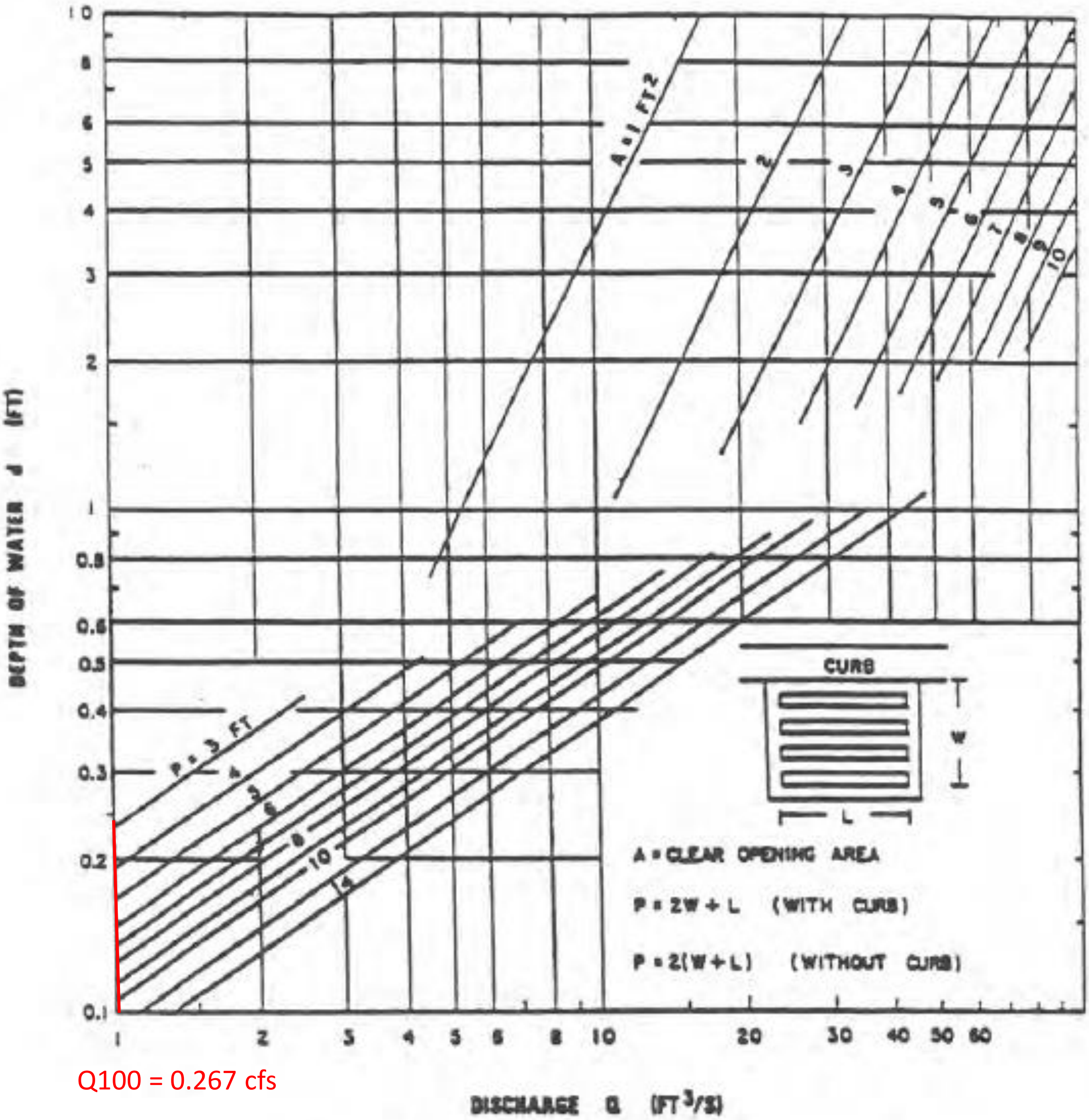
Area A.1



GRATE INLET CAPACITY IN SUMP CONDITIONS

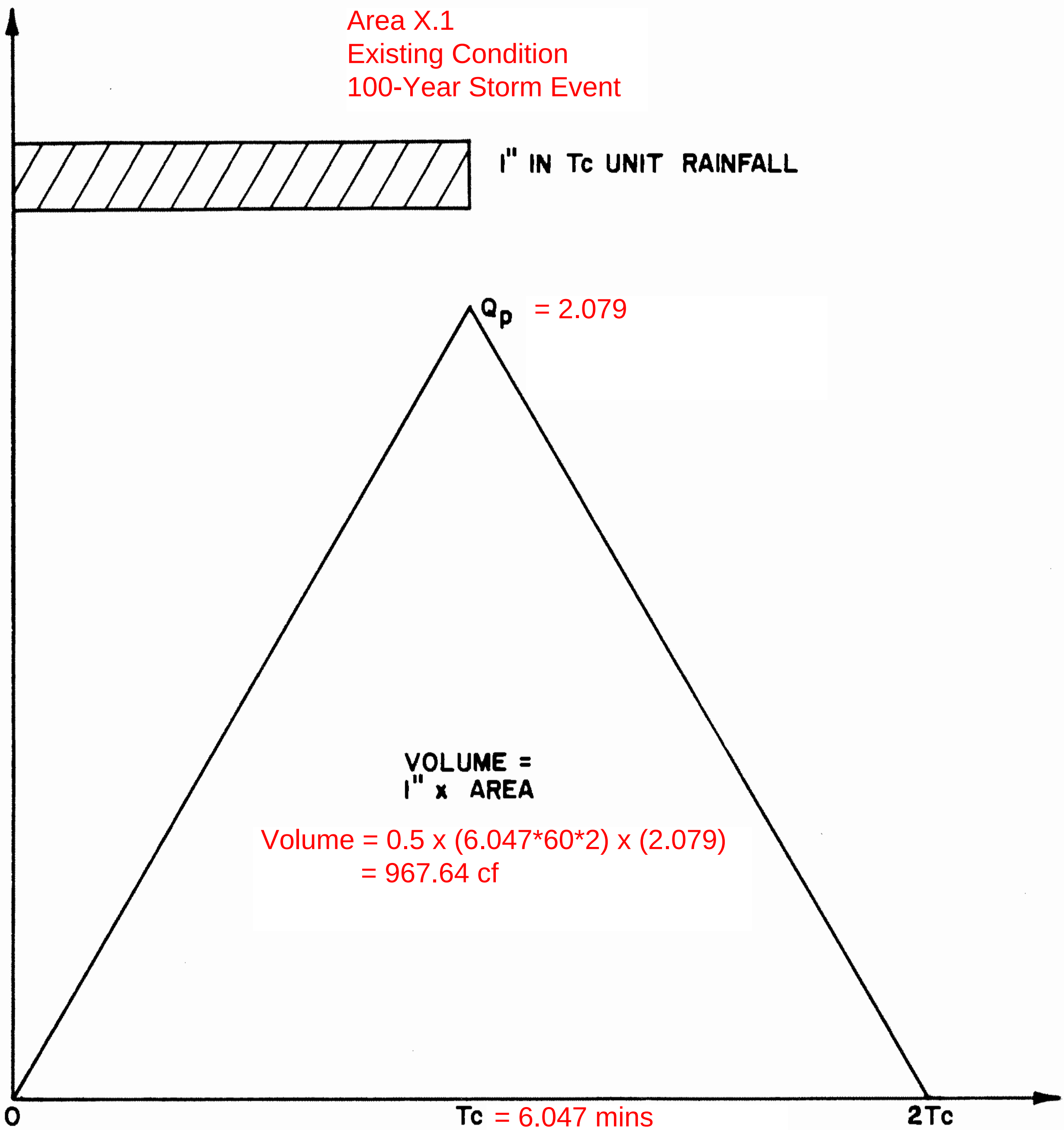
(Table assumes no clogging.)

Area A.2



GRATE INLET CAPACITY IN SUMP CONDITIONS

(Table assumes no clogging.)



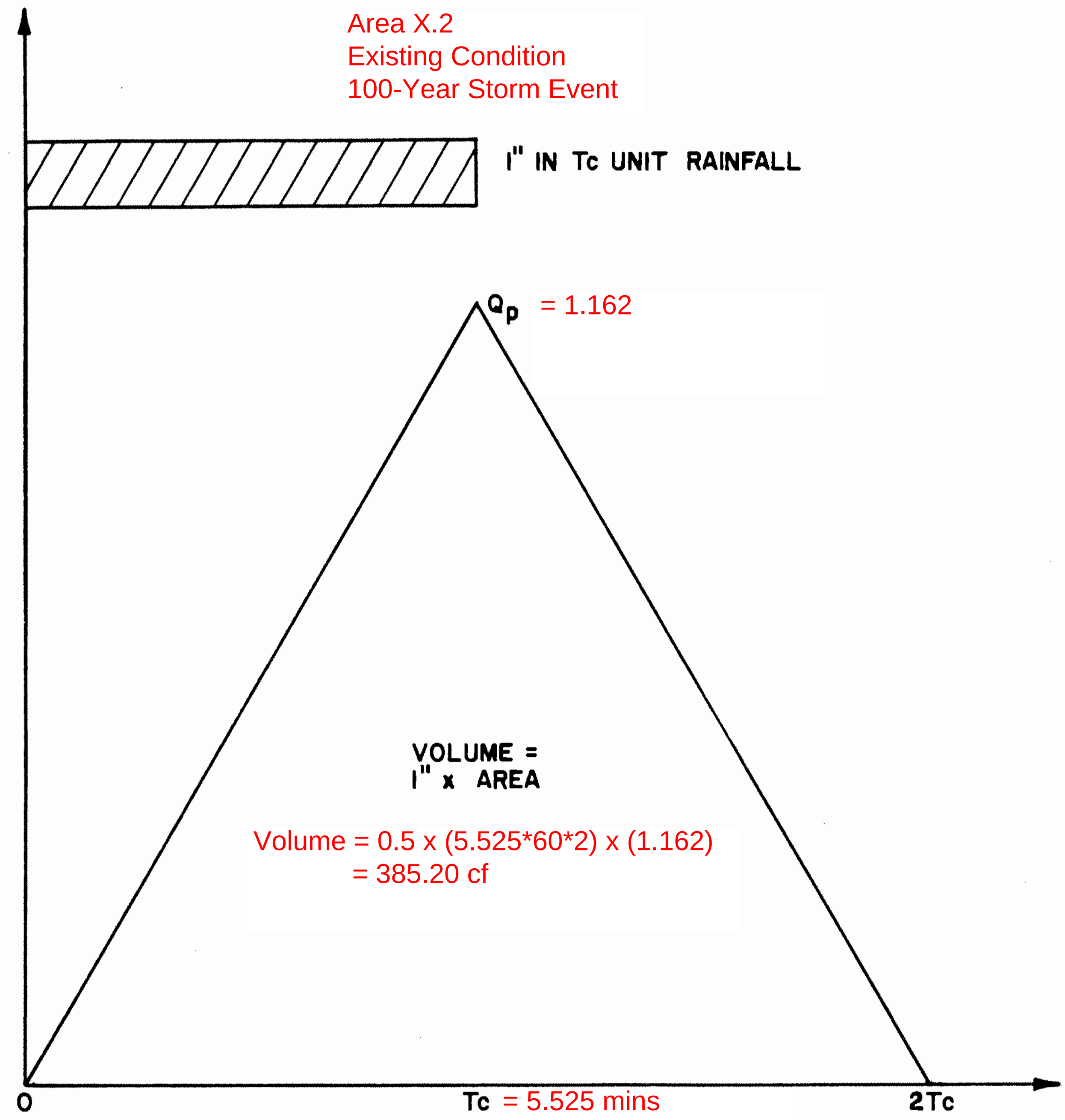
ORANGE COUNTY

HYDROLOGY MANUAL

SMALL AREA

UNIT HYDROGRAPH

Figure J-1



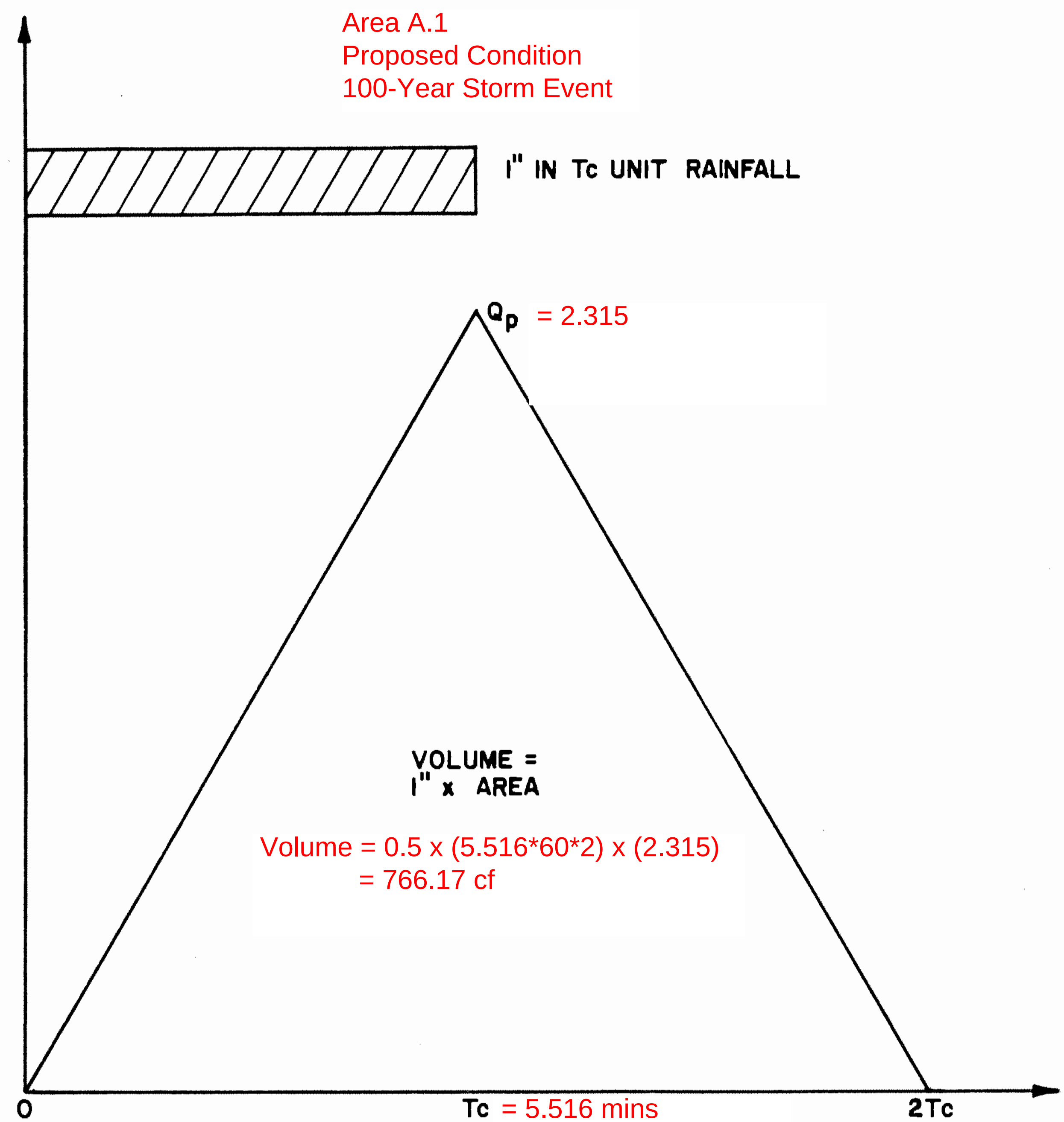
ORANGE COUNTY

HYDROLOGY MANUAL

SMALL AREA

UNIT HYDROGRAPH

Figure J-1



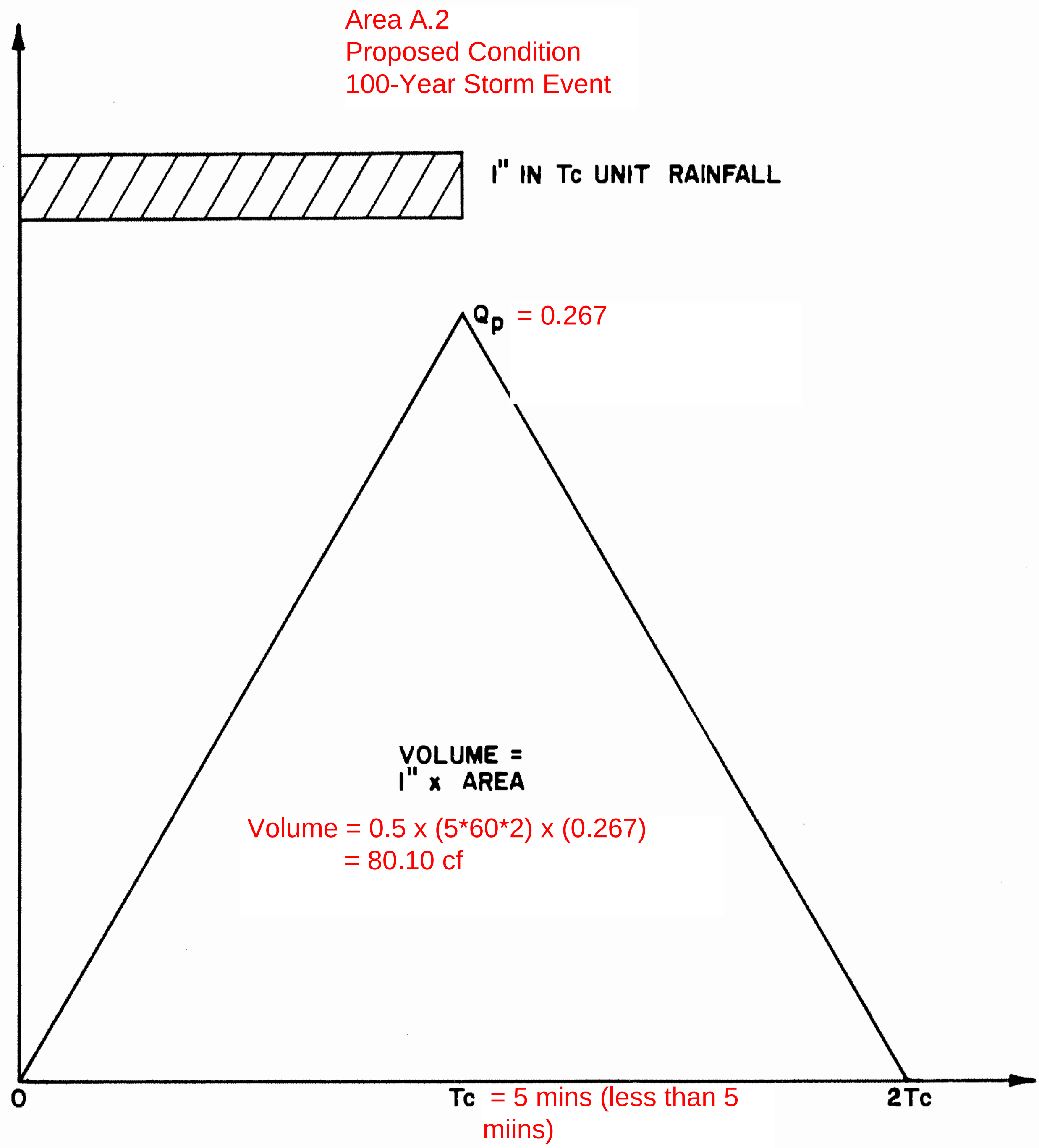
ORANGE COUNTY

HYDROLOGY MANUAL

SMALL AREA

UNIT HYDROGRAPH

Figure J-1



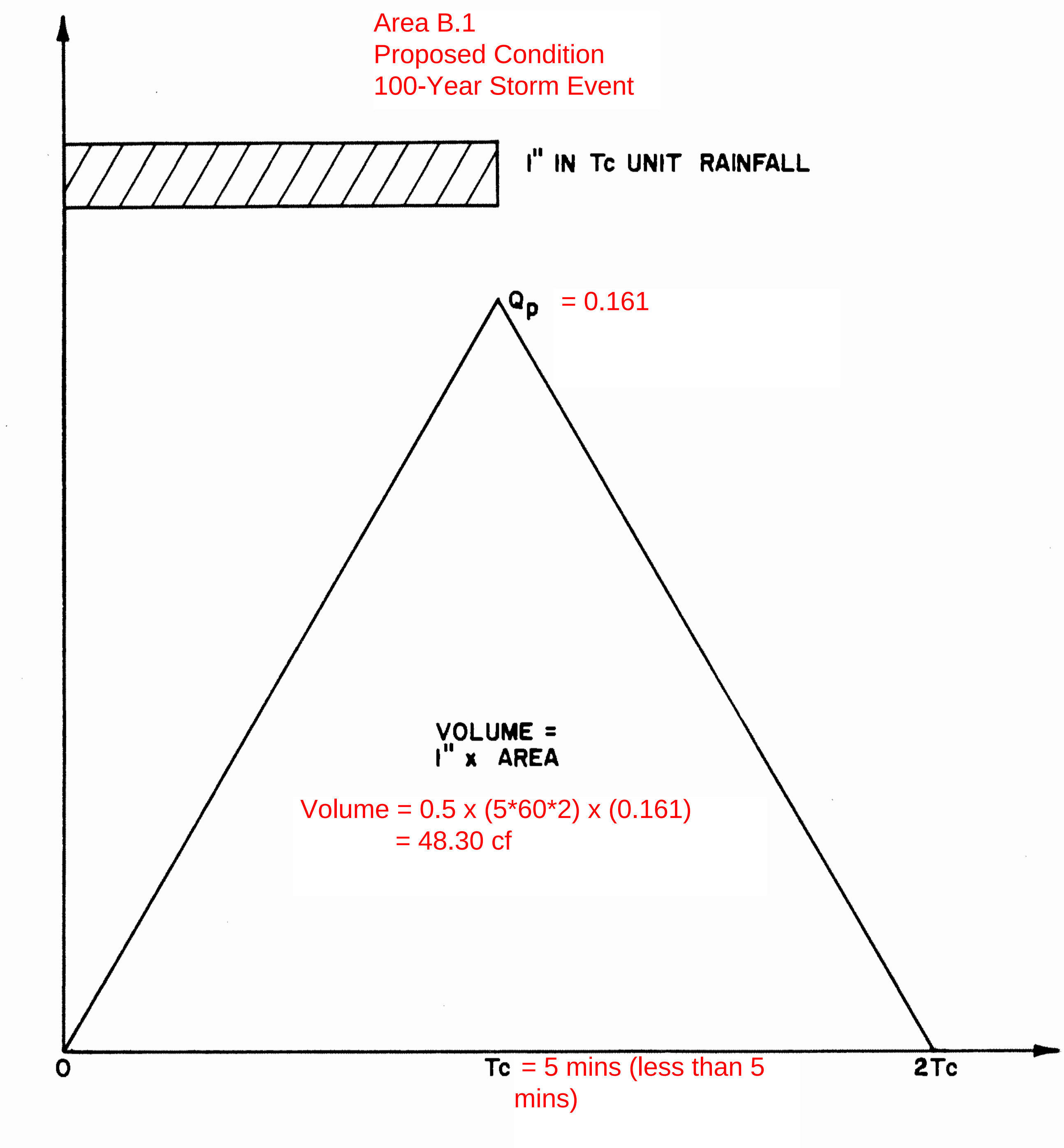
ORANGE COUNTY

HYDROLOGY MANUAL

SMALL AREA

UNIT HYDROGRAPH

Figure J-1



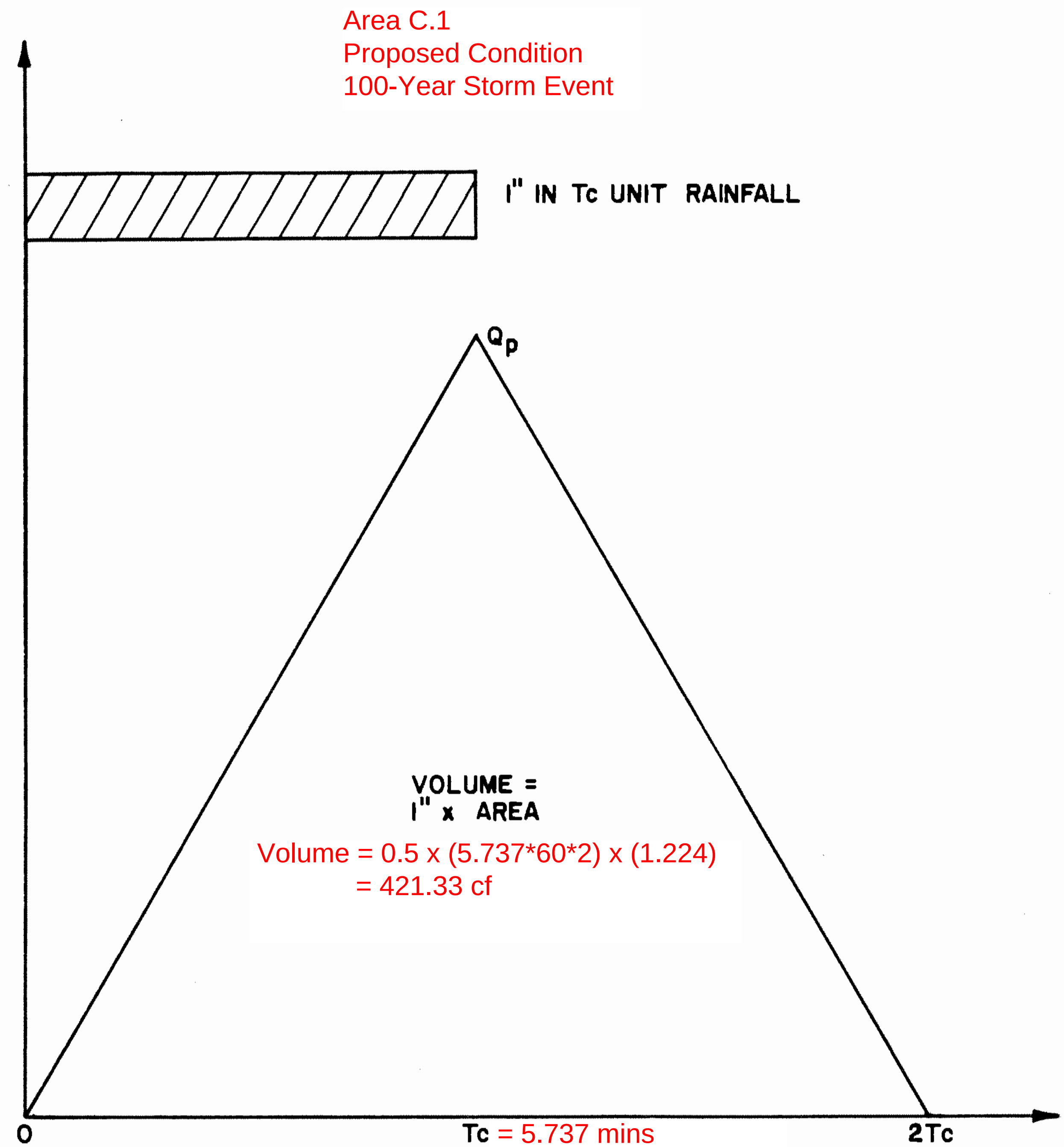
ORANGE COUNTY

HYDROLOGY MANUAL

SMALL AREA

UNIT HYDROGRAPH

Figure J-1



ORANGE COUNTY

HYDROLOGY MANUAL

SMALL AREA

UNIT HYDROGRAPH

Figure J-1

V. STORAGE CALCULATIONS

User Inputs

Chamber Model:	SC-740
Outlet Control Structure:	No
Project Name:	Monarch Bay Entry
Engineer:	Gerard Victor Katig-bak
Project Location:	California
Measurement Type:	Imperial
Required Storage Volume:	1561 cubic ft.
Stone Porosity:	40%
Stone Foundation Depth:	6 in.
Stone Above Chambers:	6 in.
Average Cover Over Chambers:	18 in.
Design Constraint Dimensions:	(15 ft. x 80 ft.)

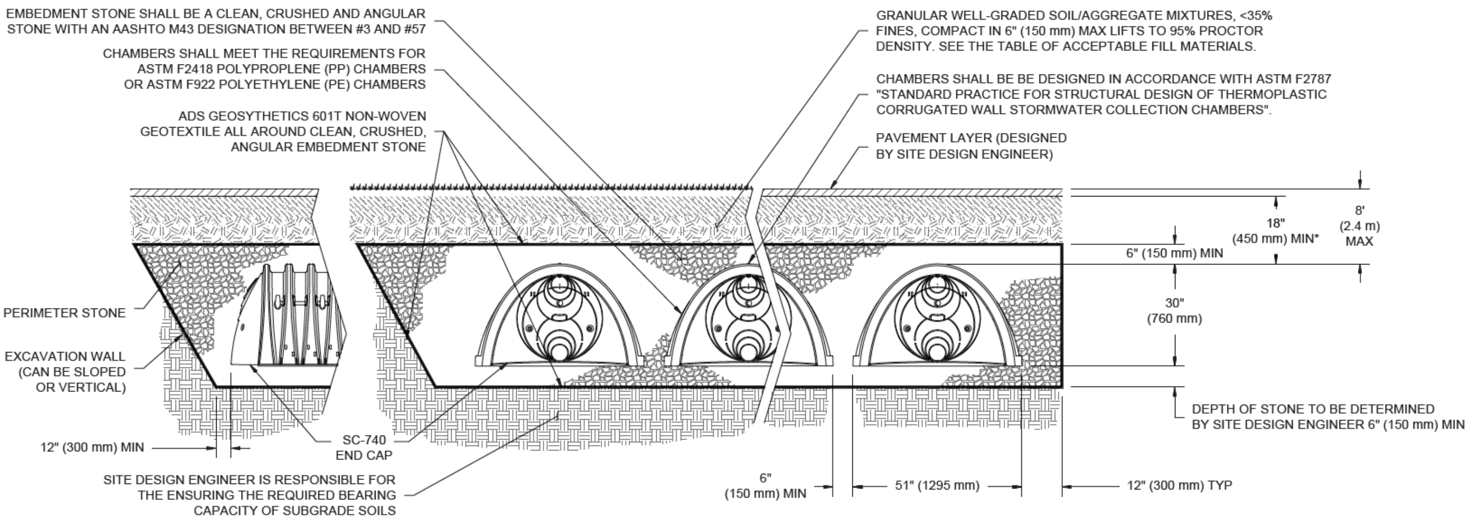
Results

System Volume and Bed Size

Installed Storage Volume:	1598.07 cubic ft.
Storage Volume Per Chamber:	45.90 cubic ft.
Number Of Chambers Required:	18
Number Of End Caps Required:	4
Chamber Rows:	2
Maximum Length:	71.58 ft.
Maximum Width:	11 ft.
Approx. Bed Size Required:	787.39 square ft.

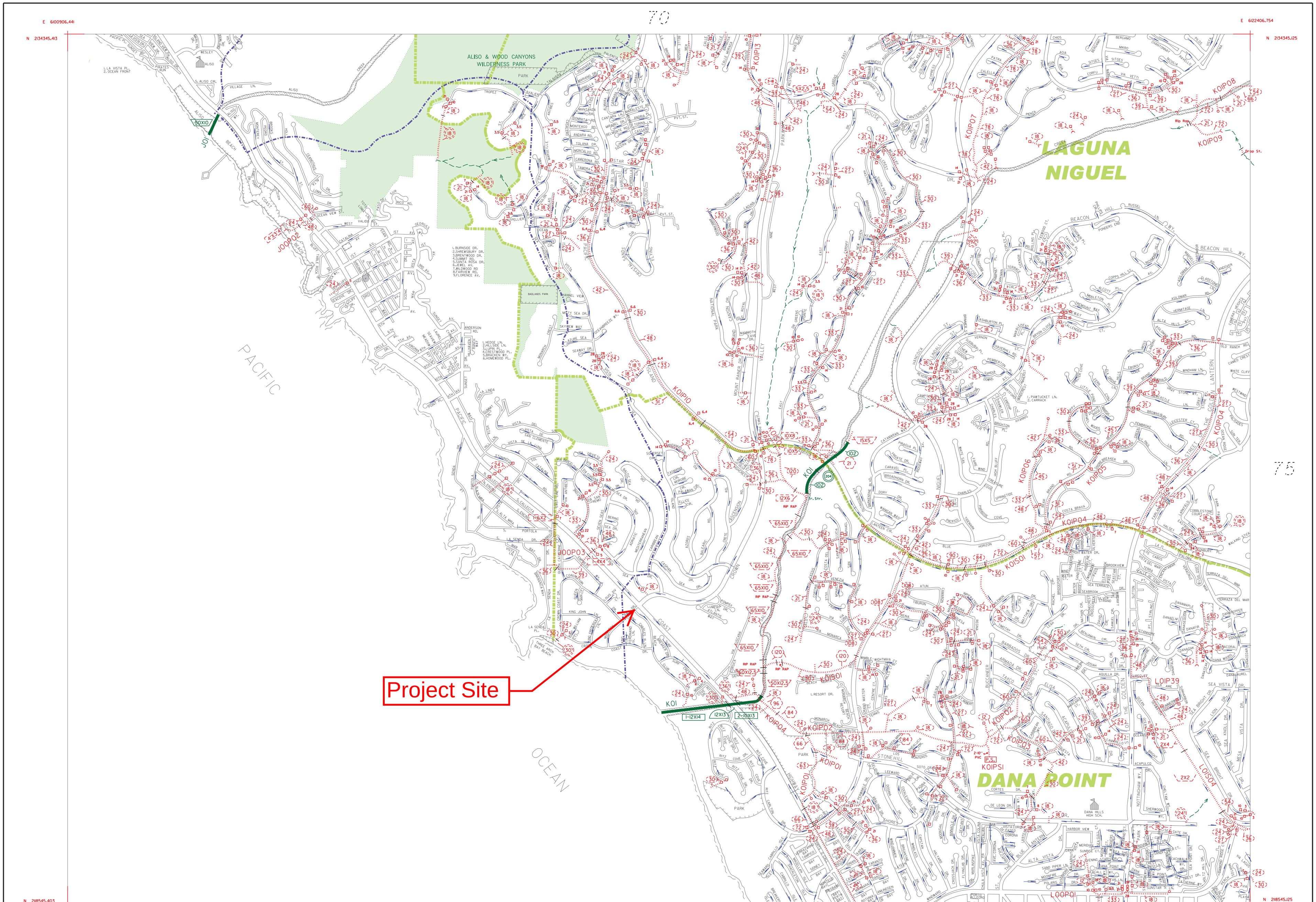
System Components

Amount Of Stone Required:	71.47 cubic yards
Volume Of Excavation (Not Including Fill):	102.07 cubic yards



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

APPENDIX A: DRAINAGE MAPS



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NOTICE

The drainage information has been prepared for information purposes only. The location, ownership, facility information and limits have been determined from available information provided by public agencies, but may not be exact, accurate, or up–to–date. The user of this information is responsible for verifying exact location, ownership, accuracy, and the regional versus local character of drainage facilities.

Additional information may be obtained from public plans and recorded deeds. Facility designations included with this information are for convenience only and are not controlling or intended to imply ownership by the County or the Orange County Flood Control District (OCFCD). The information is being provided as a courtesy and neither the County of Orange nor OCFCD assume any liabilities for inaccuracy of the information.

To notify OC Public Works Flood Control Section of additions or corrections, please contact Sal Gutierrez at (714) 834–5396 or by email at sal.gutierrez@ocpw.ocgov.com

ORANGE COUNTY FLOOD CONTROL DISTRICT

BASE MAP OF DRAINAGE FACILITIES IN ORANGE COUNTY

REVISION	DATE	SHEET NO.	DWG. NO.
S. GUTIERREZ	AUG.10.2010	74	MAPS–113–3

- Channel Drainage Area Boundary
- Major Sub–Area Drainage Boundary
- Minor Sub–Area Drainage Boundary
- Existing O.C.F.C.D. Facility
- Existing Local Facility
- Existing Retarding Basin or Reservoir
- Natural Watercourse
- City Limits
- G G Greenbelt
- P.S. P.S. Pump Station
- Catch Basin (length in feet)
- Drop Inlet or Other Entry
- OCFCD Basins or Reservoirs

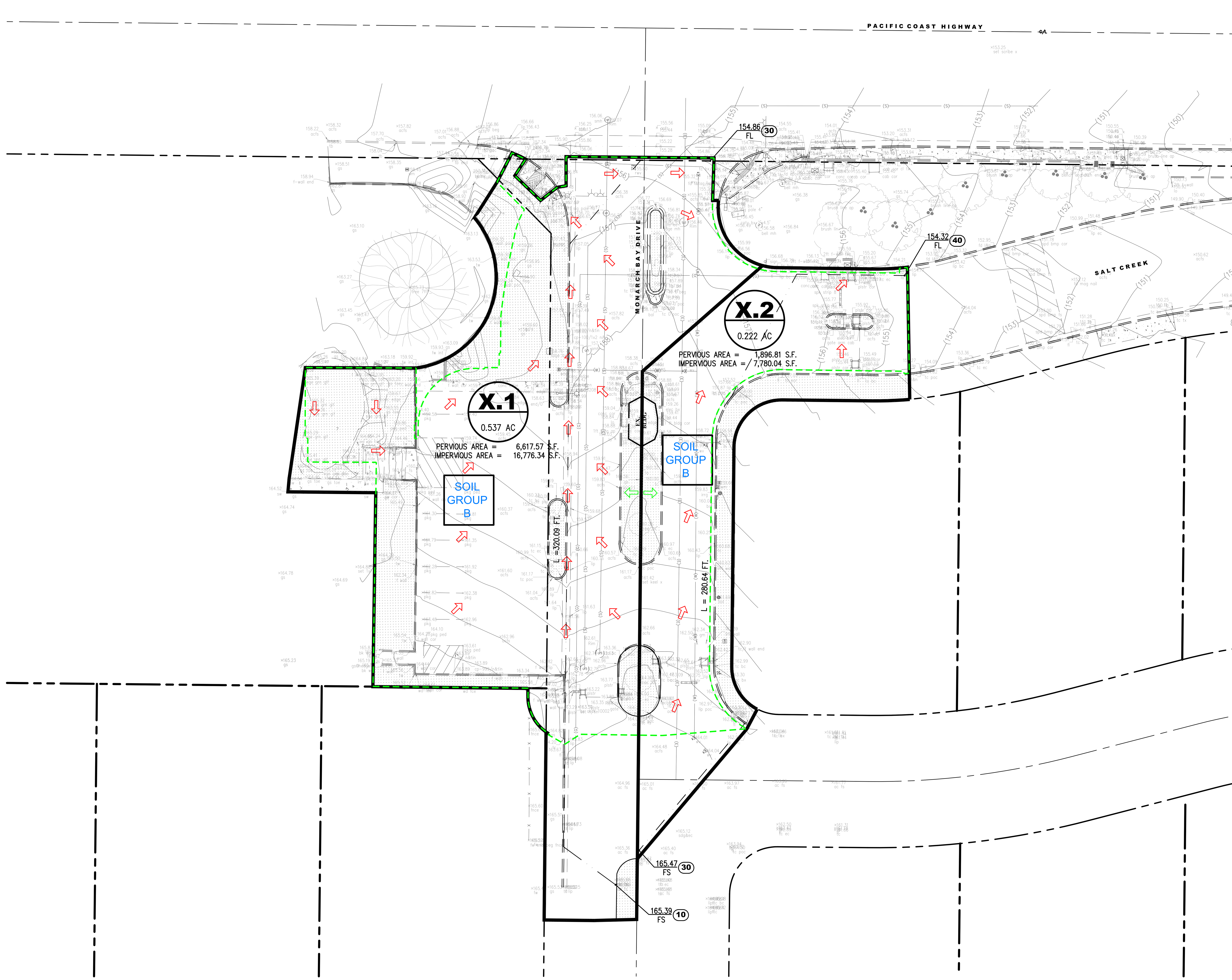
Ownership (If other than City or County): Private = P State = S Federal = F

EXISTING FACILITIES

O.C.F.C.D. LOCAL

- Earth Trapezoidal Channel (base width by height in feet)
- Reinforced Concrete Trapezoidal Channel (base width by height in feet)
- Reinforced Concrete Rectangular Channel (base width by height in feet)
- Reinforced Concrete Box (RCB) (number of barrels–span by height in feet)
- Reinforced Concrete Pipe (RCP) (diameter in inches)
- Metal Sheet Channel (MSC) (Base width by pile height in feet/Sheet pile total length)
- Corrugated Metal Pipe (CMP) (diameter in inches)
- Concrete Pipe (diameter in inches)
- Concrete Oval Pipe (width by height in inches)
- Steel Pipe (diameter in inches)
- Reinforced Concrete Arch (base span by height in inches)
- Corrugated Metal Arch (base span by height in inches)

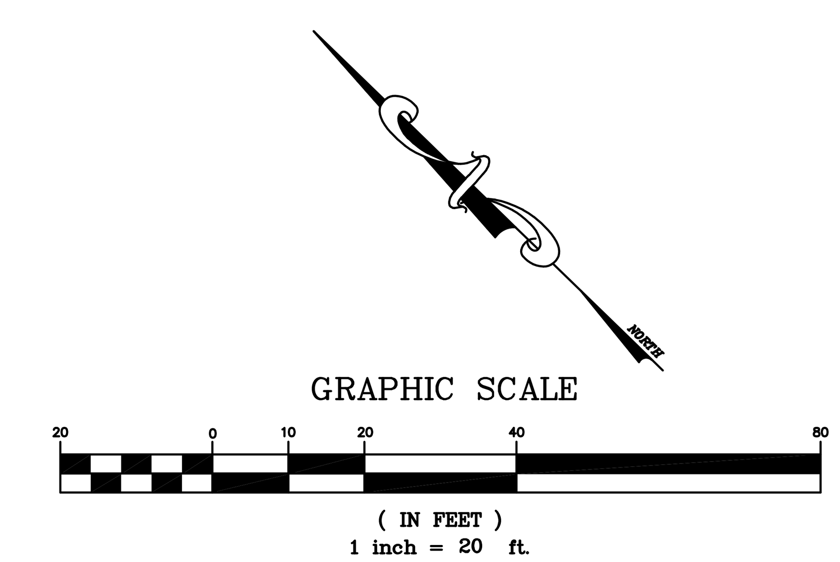
74



LEGEND

DRAINAGE BOUNDARY
SUB-AREA BOUNDARY
FLOW PATH
XX XXXX — SUB-AREA I.D. / SUB-AREA (IN ACRES) (AREA A.10 NOT USED)
XX (XXX.XX) FS — NODE NUMBER

IMPERVIOUS AREA	=	0.564 AC
PERVIOUS AREA	=	0.195 AC
TOTAL AREA	=	0.759 AC



ORIGINAL SCALE: INCHES

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO. –
PROJECT NO. 1454-001

DESIGNED: KMS
DRAWN: SC
CHECKED: KMS

.\kurtsignature2.tif
04/03/2020 DATE
44180 R.C.E. NO.
ENGINEER OF WORK

PLANS PREPARED BY:
saxonengineering
SAXON ENGINEERING SERVICES, INC
2605 TEMPLE HEIGHTS DRIVE, SUITE A, OCEANSIDE, CA 92056
TEL: 949.366.2180 FAX: 800.653.4193

BENCHMARK
COUNTY OF ORANGE BM
NO: 3P-35-04
ELEVATION: 157.955
DATUM: NAVD 88

APPROVED BY THE CITY OF DANA POINT PLANNING DEPARTMENT
THIS PLAN HAS BEEN REVIEWED FOR ZONING ONLY AND MEETS THE REQUIREMENT OF THE DANA POINT MUNICIPAL CODE:
CITY PLANNING DEPARTMENT — DATE

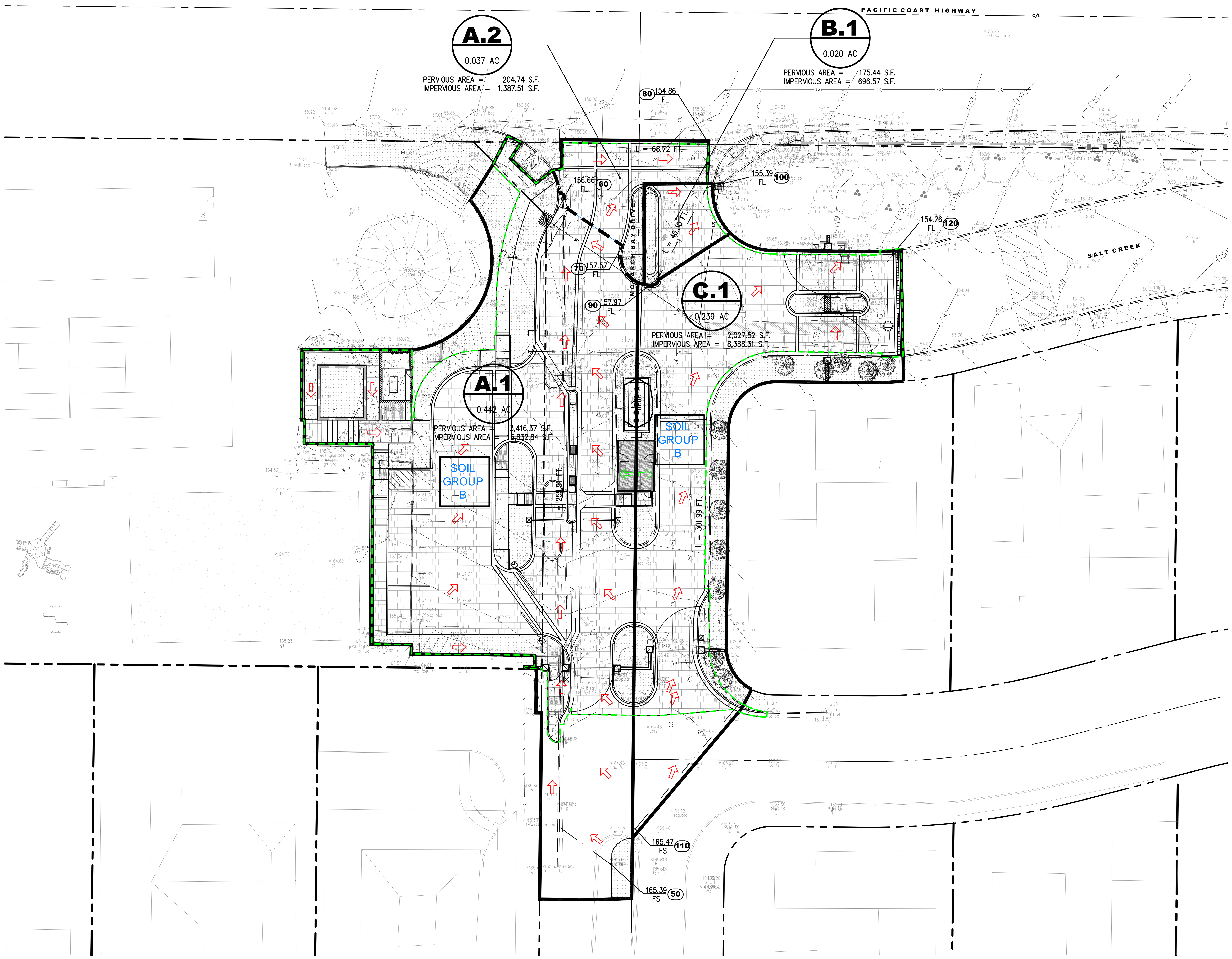
PLANS REVIEWED BY:
CITY OF DANA POINT, PUBLIC WORKS & ENGINEERING SERVICES
33282 GOLDEN LANTERN
DANA POINT, CA 92629
MATTHEW V. SINACORI, CITY ENGINEER — DATE
RCE #59239 EXP. 06/30/21
THIS PLAN IS SIGNED BY THE CITY ENGINEER FOR SCOPE AND ADHERENCE TO CITY STANDARDS AND REQUIREMENTS, CITY CODES, AND OTHER GENERAL ENGINEERING AND REGULATORY REQUIREMENTS ONLY. THE CITY ENGINEER IS NOT RESPONSIBLE FOR DESIGN, ASSUMPTIONS, OR ACCURACY.

CITY OF DANA POINT

HYDROLOGY-WQMP EXHIBIT

MONARCH BAY ENTRY
MONARCH BAY ESTATES MAIN ENTRY
DANA POINT, CA

PLAN CHECK NO.
ENG XX-XXXX
1 OF 1 SHEETS



LEGEND

- DRAINAGE BOUNDARY
- SUB–AREA BOUNDARY
- FLOW PATH
- XX — SUB–AREA I.D.
- XXXX — SUB–AREA (IN ACRES) (AREA A.10 NOT USED)
- XX (XXX.XX) FS — NODE NUMBER

IMPERVIOUS AREA	=	0.604 AC
PERVIOUS AREA	=	0.134 AC
TOTAL AREA	=	0.748 AC

REGISTERED PROFESSIONAL ENGINEER KURT M. SAXON NO. 44180 Exp. 6/30/21 CIVIL STATE OF CALIFORNIA

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

ORIGINAL SCALE: INCHES 0 1 2 3 4

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO. –
PROJECT NO. 1454–001

DESIGNED: KMS | DRAWN: SC | CHECKED: KMS

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CITY OF DANA POINT

PROPOSED HYDROLOGY MAP

MONARCH BAY ENTRY
MONARCH BAY ESTATES MAIN ENTRY
DANA POINT, CA

PLAN CHECK NO. ENG XX–XXXX

1 OF 1 SHEETS