Son-Engineering

PRELIMINARY DRAINAGE STUDY

FOR

BORDEAUX AVE ADU

2734 Bordeaux Avenue
La Jolla, CA 92037

CITY OF SAN DIEGO
COASTAL DEVELOPMENT PERMIT
PRJ NO. 1087614

ASSESSOR'S PARCEL NUMBER:
344-100-03-00

PREPARED FOR:
ATC VENTURES, LLC
195 Razal Drive
Hillsborough, CA 94010

PREPARED BY:
Son-Engineering
civil engineers
P.O. Box 1707
Alpine, CA 91903
(619) 770-9339, son@soncivil.com
SON2404-04

Dated: April 30, 2024
Revised: September 6, 2024

TABLE OF CONTENTS

PRELIMINARY DRAINAGE STUDY

FOR

2734 Bordeaux Ave ADU CDP

The project site is located on the northerly side of Bordeaux Avenue, west of Glenwich Lane with Assessor's Parcel No. 344-100-03. The project proposes to construct a 1-story ADU building with garden roof over the rear portion of the site, northwesterly from the rear deck of the main house. Portion of the ADU will be on a raised foundation. The following hydrology calculations were prepared utilizing the Rational Method and the most current County of San Diego Drainage Design Manual criteria and the 2016 Advanced Engineering Solfware (aes). Hydrologic Soil Type D is used.

PRE-DEVELOPMENT CONDITIONS: The site topography consists of slopy land descending northwesterly. Elevations are ranging from 362.5 feet above mean sea level at the northeasterly corner of site to 275 feet at the westerly boundary. There is an existing natural drainage creek located in the rear of the property where it conveys the runoff from an approximate 0.97-acre upstream area. ***The total peak*** **100-year discharge in this drainage creek was calculated to be 2.26 cfs.** The on-site drainage basin within the previously developed area consists of approximately 0.17 acre. Its surface runoff is collected in a small storm drain inlets scattered throughout the site and conveyd to a sump pump located at the northwesterly corner of the existing house. A forced flow from sump pump discharges into Bordeaux Ave gutter via sidewalk underdrain pipe located at the southeasterly corner of the site as shown on the As-built grading plan Dwg. 31675-2. ***The total peak*** **100-year discharge from 0.17-acre site was calculated to be 0.45 cfs.**

POST-DEVELOPMENT CONDITIONS: The proposed ADU building will be located within the subdrainage basin of the natural drainage creek in the rear. The ADU roof top will have landscape gardens along with gravel mulch cover. Proposed roof drain and site drainage around the ADU shall be conveyed to the natural drainage creek via concrete drainage ditch which equipped with an energy dissipater rock rip rap at its outfall. ***The total peak*** **100-year discharge in this drainage creek at the project outfall was calculated to be 2.26 cfs.** Similar to the pre-development drainage pattern, the runoff from the existing house and side yards is collected in a sump pump and discharged into Bordeaux Avenue gutter. ***The total peak*** **100-year discharge was calculated to be 0.45 cfs.**

The following tables are a summary of the 100-year peak discharges for the pre- and post-development conditions:

Table 1: Summary of Pre-Development 100-year, 6-hour Storm Event

BASIN	AREA (AC)	RUNOFF COEFFICIENT "C"	INTENSITY "I" (Inch/hr)	DISCHARGE Q_{100} (CFS)
1A	0.12	0.46	5.796	2.26
1B	0.85	0.46	5.054	
2	0.17	0.46	5.796	0.45

Table 2: Summary of Post-Development 100-year, 6-hour Storm Event

BASIN	AREA (AC)	RUNOFF COEFFICIENT "C"	INTENSITY "I" (Inch/hr)	DISCHARGE Q_{100} (CFS)
1A	0.12	0.46	5.796	2.26
1B	0.85	0.46	5.054	
2	0.17	0.46	5.796	0.45

CONCLUSION:

- The peak 100-year discharge from the post-construction condition is the same. No increase in impervious surface area is proposed.

- There will be no negative impacts to downstream and/or adjacent properties due to the construction of the proposed development.

- The project site does not impact waters of the U.S.; therefore, it is not subject to CWA 401/404 regulations.

DECLARATION OF RESPONSIBLE CHARGE

I, HEREBY DECLARE THAT I AM THE CIVIL 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 RESPONSIBILITY FOR PROJECT DESIGN.

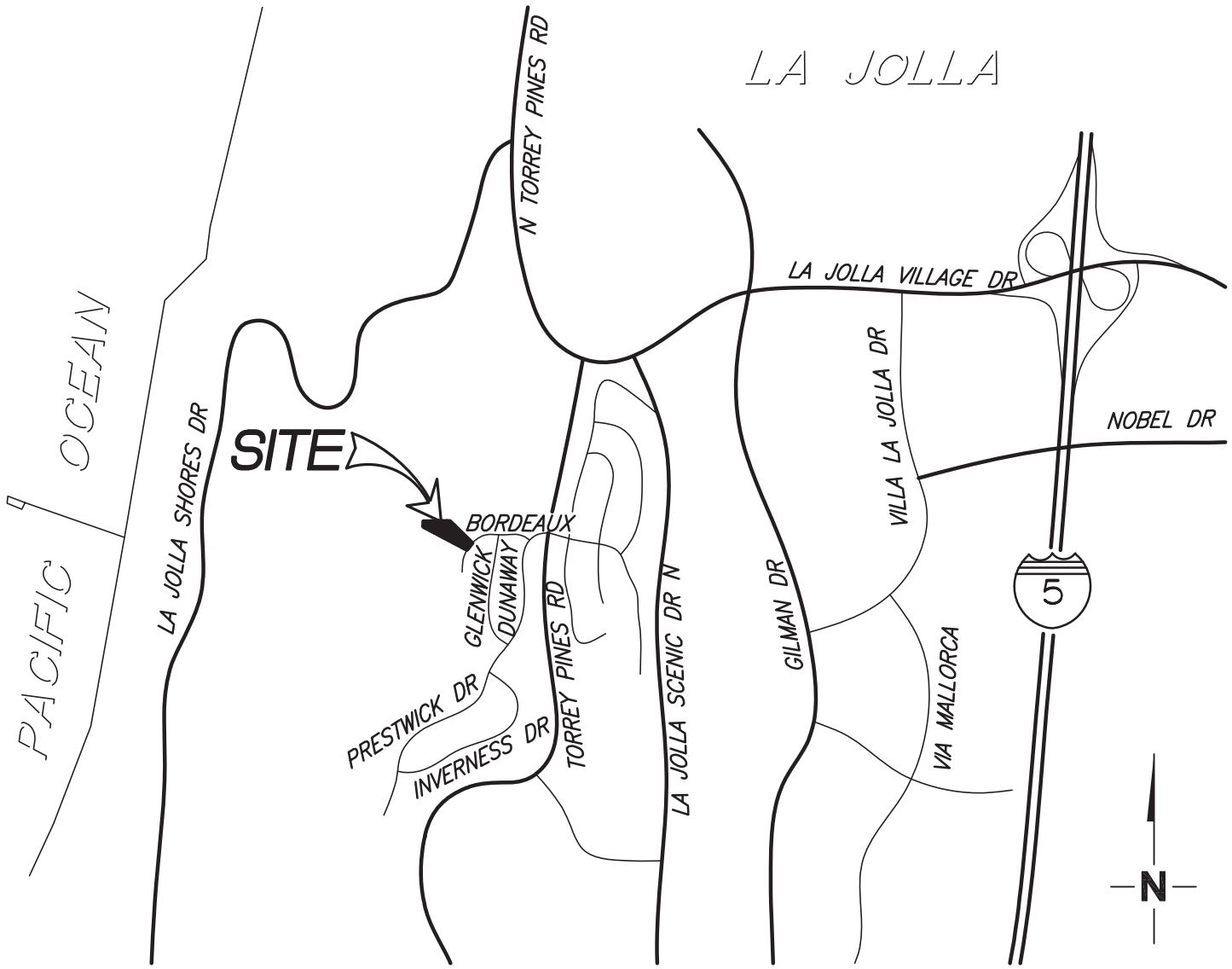
Son P. Nguyen

Digitally signed by Son P. Nguyen
DN: C=US, E=son@soncivil.com, O=Son-Engineering, CN=Son P. Nguyen
Date: 2024.10.18 06:37:49-07'00'

10/17/24

SON P. NGUYEN
R.C.E. 86249
EXP. 03-31-25

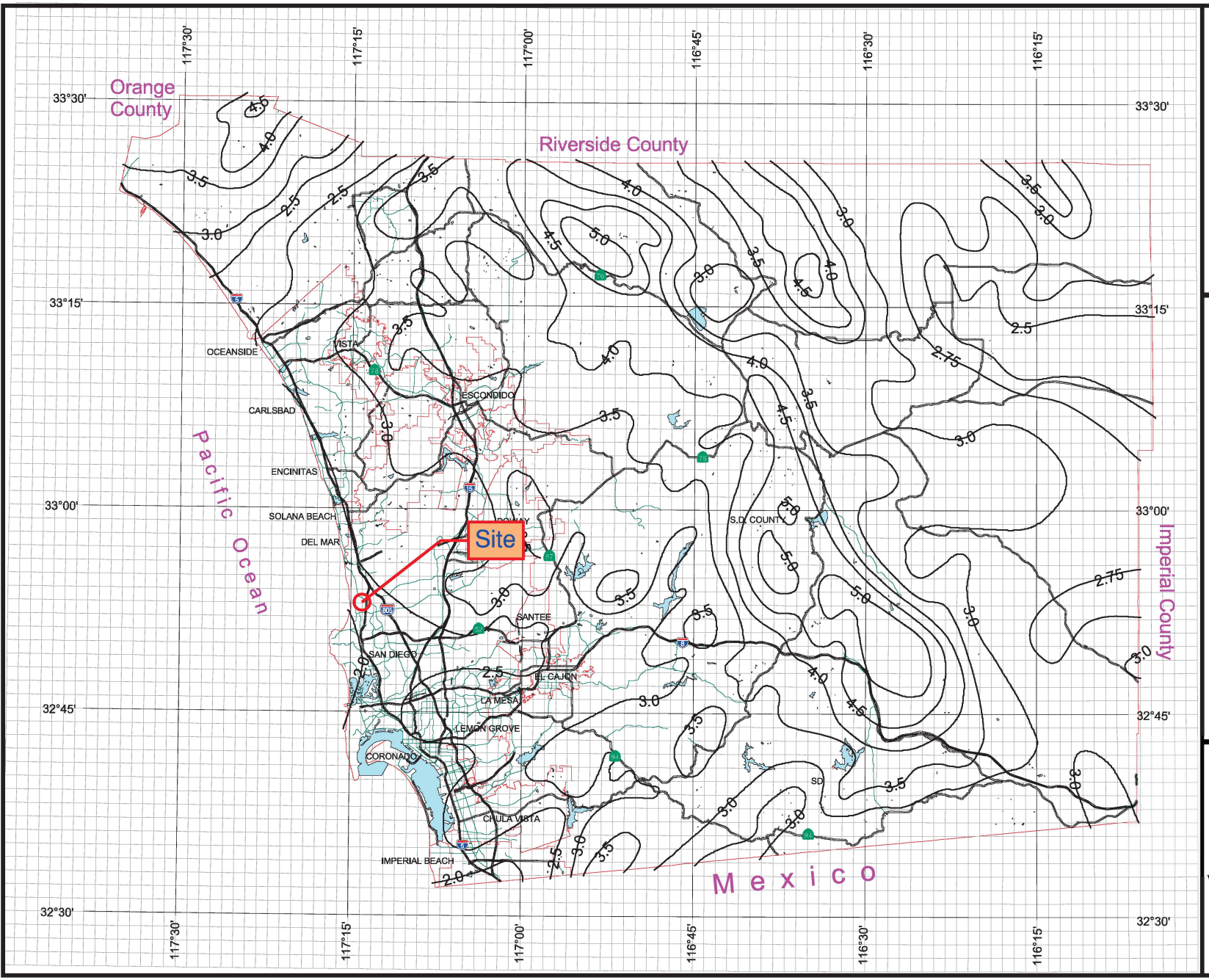
DATE



VICINITY MAP

NO SCALE

PROJECT INFORMATION



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

2.2 Isopluvial (inches)

Bordeaux Ave ADU

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N
W E
S

3 0 3 Miles

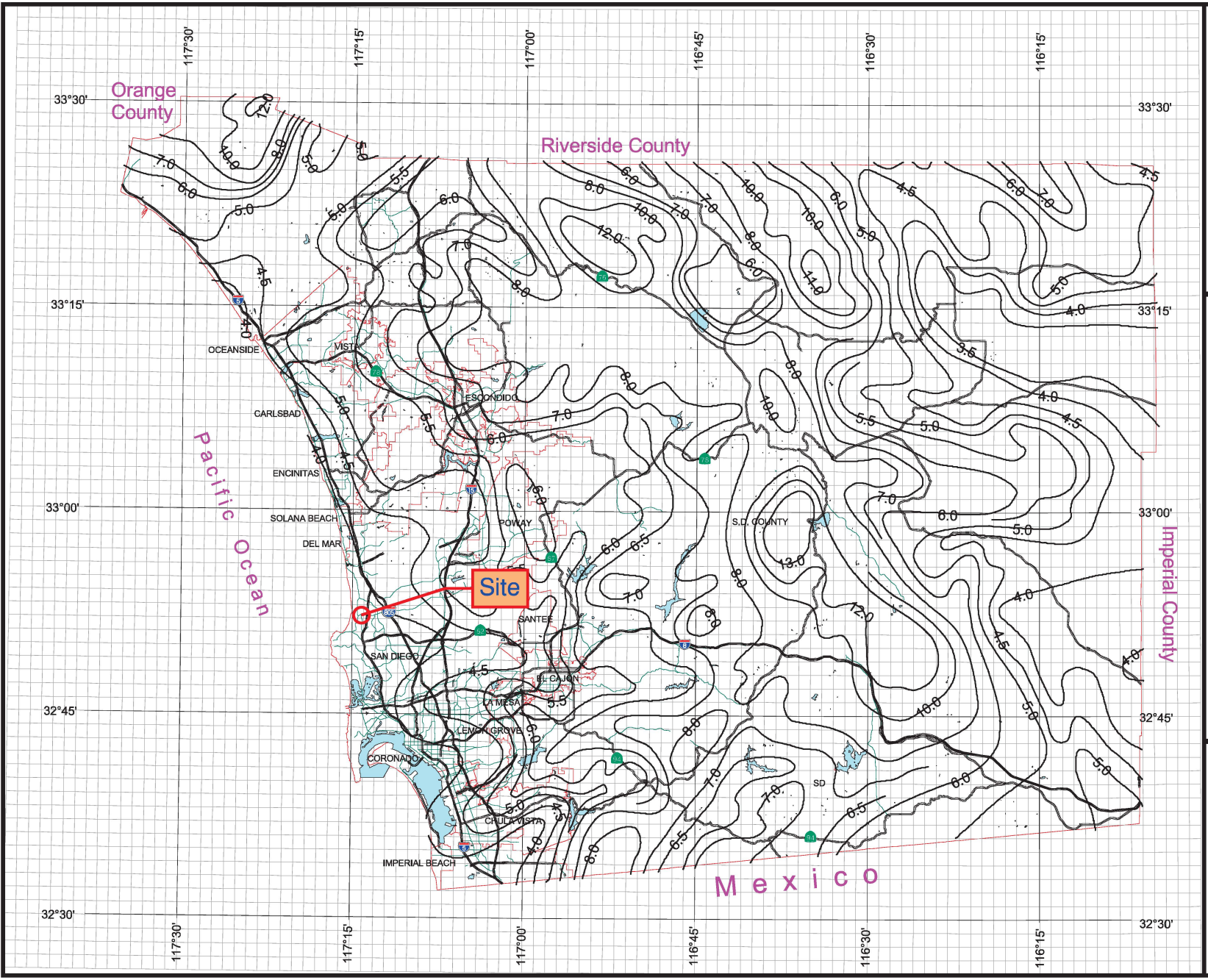
County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

3.8 Isopluvial (inches)

Bordeaux Ave ADU



DPW GIS
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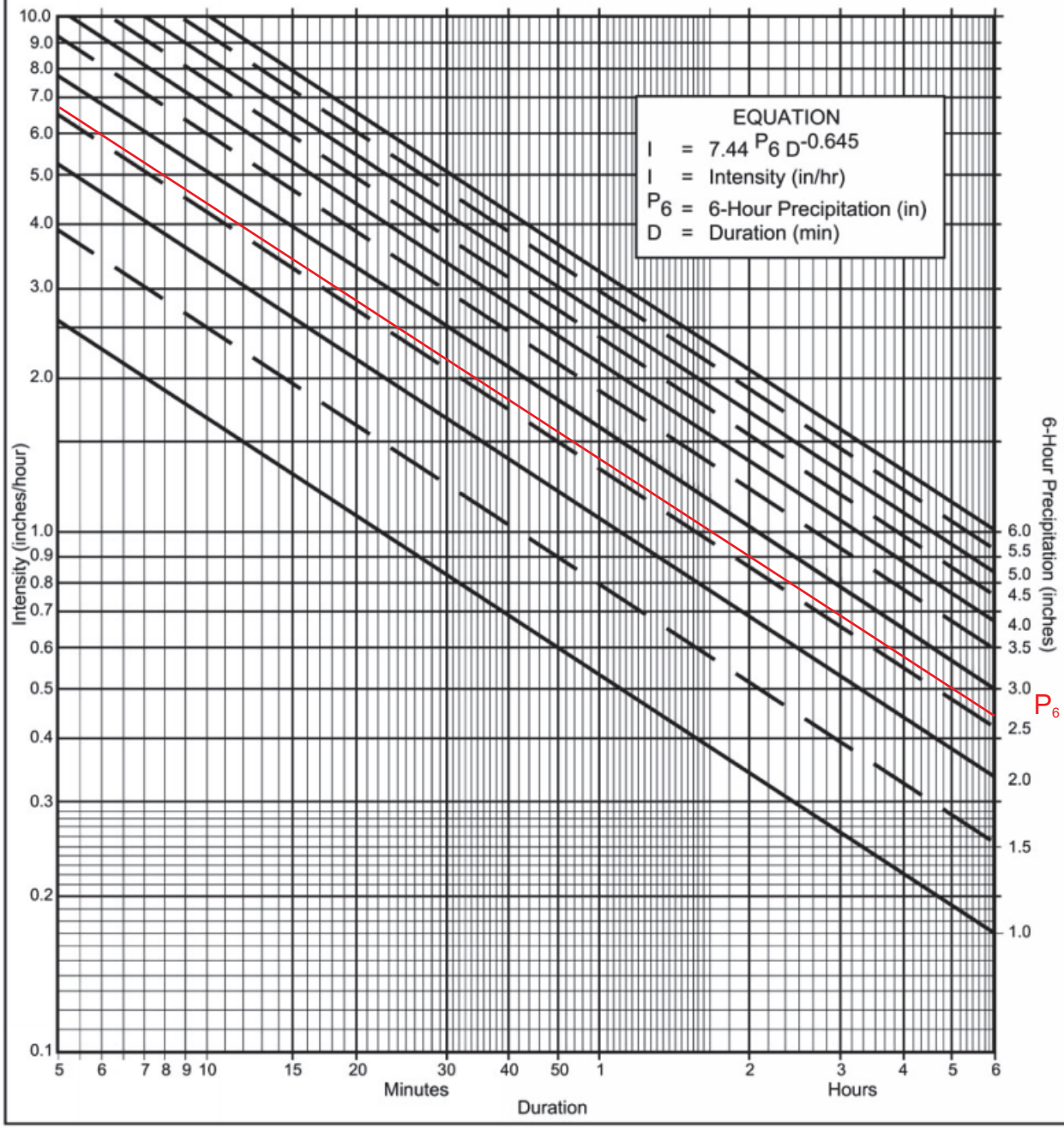
3 0 3 Miles

Bordeaux Ave ADU



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 2.2 in., P_{24} = 3.8, $\frac{P_6}{P_{24}}$ = 58 %(2)

(c) Adjusted P_6(2) = 2.2 in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

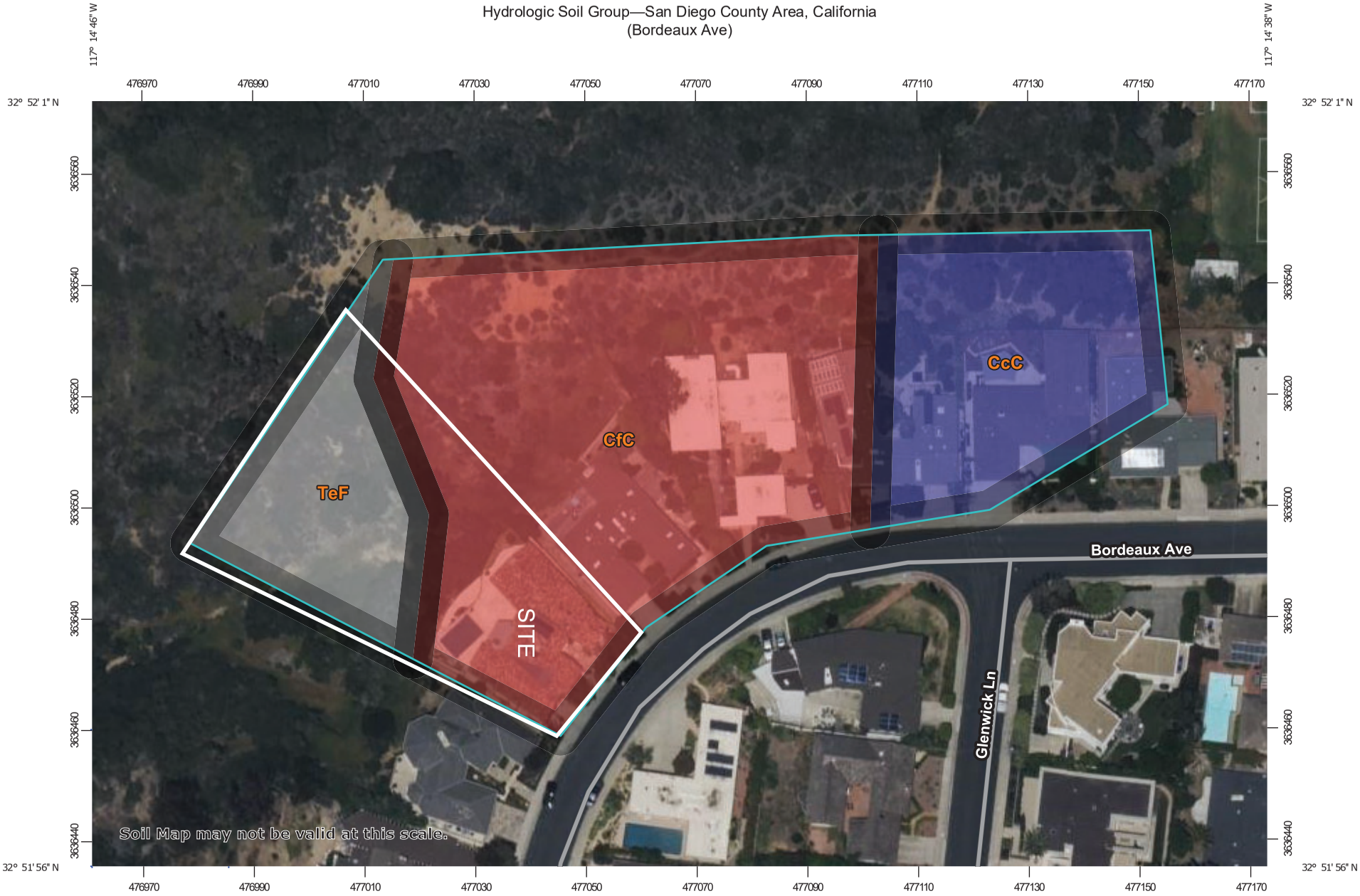
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

Hydrologic Soil Group—San Diego County Area, California
(Bordeaux Ave)



Map Scale: 1:971 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

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 19, Aug 30, 2023

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

Date(s) aerial images were photographed: Mar 24, 2022—Apr 29, 2022

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
CcC	Carlsbad-Urban land complex, 2 to 9 percent slopes	B	0.6	24.1%
CfC	Chesterton fine sandy loam, 5 to 9 percent slopes	D	1.5	60.8%
TeF	Terrace escarpments		0.4	15.1%
Totals for Area of Interest			**2.4**	**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

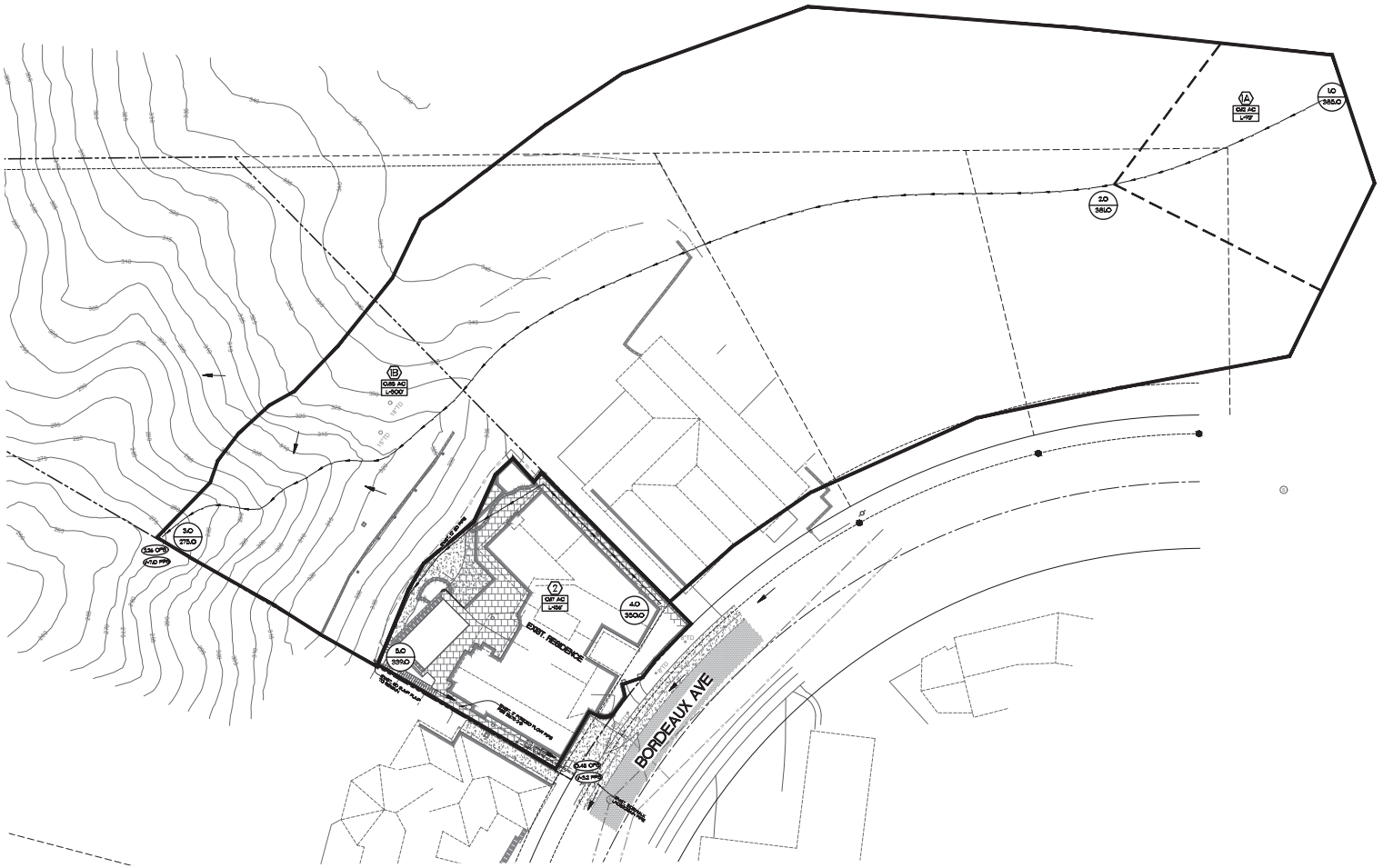
Aggregation Method: Dominant Condition

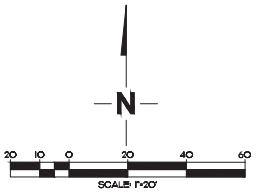
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

DRAINAGE MAPS

PRE-CONSTRUCTION DRAINAGE MAP





PRE & POST DEVELOPMENT 100-YR. PEAK DISCHARGES

PRE-DEVELOPMENT							POST-DEVELOPMENT						
BASIN ⬡	TIME OF CONCENTRATION Tc (MIN.)	AREA A (ACRES)	NRCS HYDROLOGIC SOIL TYPE	RUNOFF FACTOR "C"	INTENSITY "I" (INCH/HR)	DISCHARGE Q100 (CFS)	BASIN ⬡	TIME OF CONCENTRATION Tc (MIN.)	AREA A (ACRES)	NRCS HYDROLOGIC SOIL TYPE	RUNOFF FACTOR "C"	INTENSITY "I" (INCH/HR)	DISCHARGE Q100 (CFS)
1A	5.0	0.12	D	0.46	5.796	2.26	1A	5.0	0.12	D	0.46	5.796	2.26
1B	6.18	0.85	D	0.46	5.054		1B	6.18	0.85	D	0.46	5.054	
2	5.0	0.17	D	0.46	5.796	0.45	2	5.0	0.17	D	0.46	5.796	0.45
					TOTAL = 2.71 CFS							TOTAL = 2.71 CFS	

LEGEND

- BASIN ID NO. ⬡ 1
- DRAINAGE BASIN BOUNDARY
- FLOW PATH
- STUDY NODE W/ ELEVATION ⬡ 1.0 / 385.0
- BASIN AREA W/ FLOW LENGTH 0.46 AC / L=280'
- DIRECTION OF FLOW
- 100-YEAR PEAK DISCHARGE 2.71 CFS

ENGINEER OF WORK

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P.O. BOX 1707, ALPINE, CA 91903
(619) 270-9378, son@soncivil.com

SON P. NGUYEN R.C.E. 86249
EXPIRES 03-31-25

REGISTERED PROFESSIONAL ENGINEER
SON P. NGUYEN
C 86249
Exp. 03-31-25
CIVIL
STATE OF CALIFORNIA

STAMP

BORDEAUX AVENUE ADU

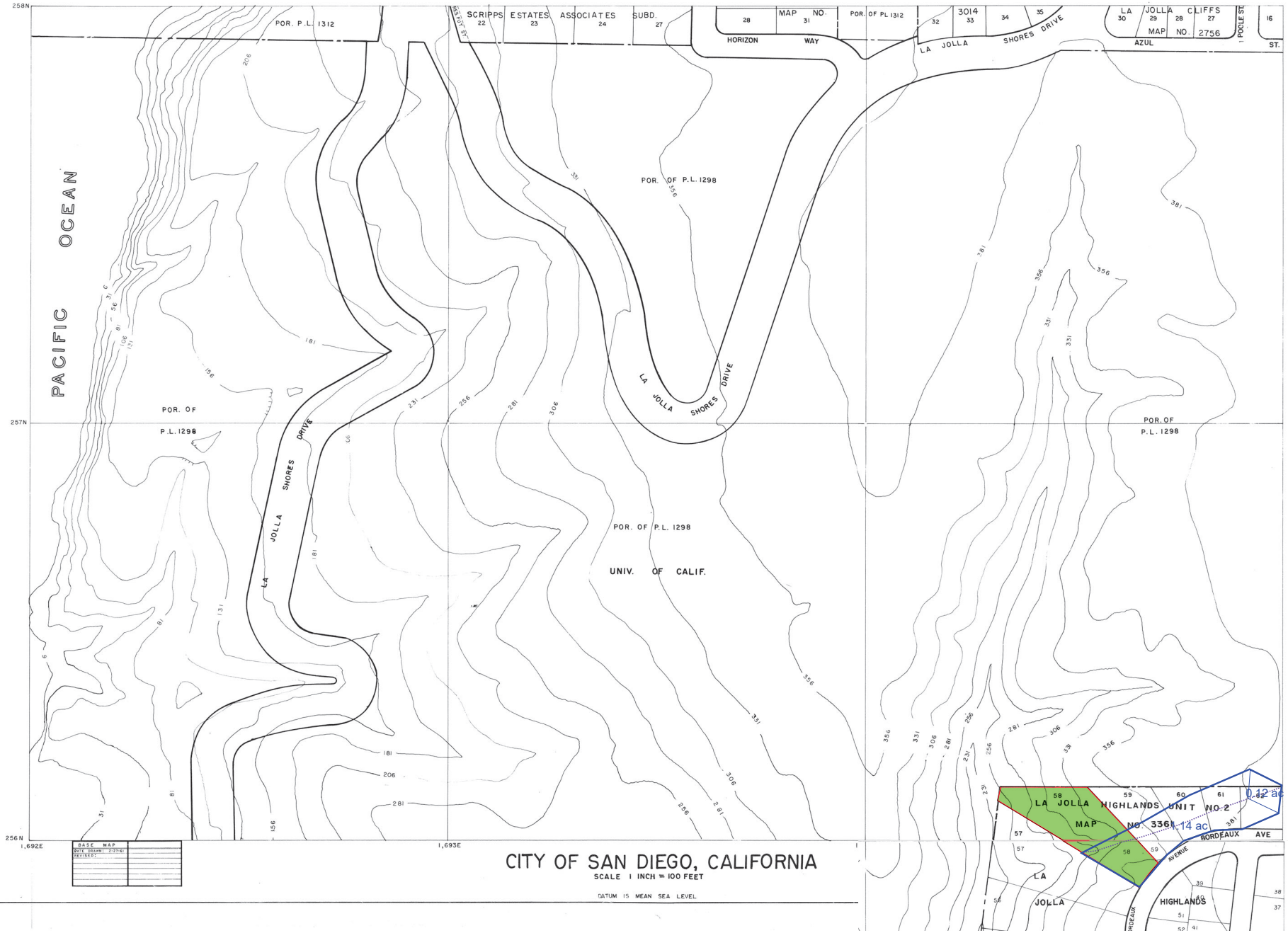
2734 Bordeaux Avenue, La Jolla, CA 92037

REVISIONS

NO.	DESCRIPTION	DATE
01	REVIEW CYCLE	9/6/2024

SHEET NAME

PROJECT NO. SON2404-04
DATE: 25 APRIL, 2024
DRAWN BY: SON
CHECKED BY: SON
SHEET NUMBER



BASE MAP
DATE DRAWN: 7-27-61
REVISED:

CITY OF SAN DIEGO, CALIFORNIA

SCALE 1 INCH = 100 FEET

DATUM IS MEAN SEA LEVEL

SURVEYOR	INSTRUMENT MAN	CHAINMAN	CHAINMAN	DATE	W.O. NO.

NOTE:

1.- THIS PROPOSED GRADING EXCAVATES A LOWER FLOOR WHERE AN EXISTING BUILDING FOOTPRINT IS LOCATED. 90% OF GRADING IS WITHIN THE PROPOSED BUILDING AND RETAINED BY THE BUILDING'S STRUCTURAL WALLS.

2.- ALL ROOF DRAINS WILL BE COLLECTED, PUMPED, AND DRAIN TO BORDEAUX AVENUE.

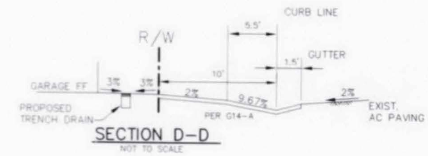
3.- PATIO, DECK AREAS, FIRST FLOOR AREAS WILL DRAIN TO SUMP AREA AS SHOWN TO BE PUMPED TO BORDEAUX AVENUE AS SHOWN.

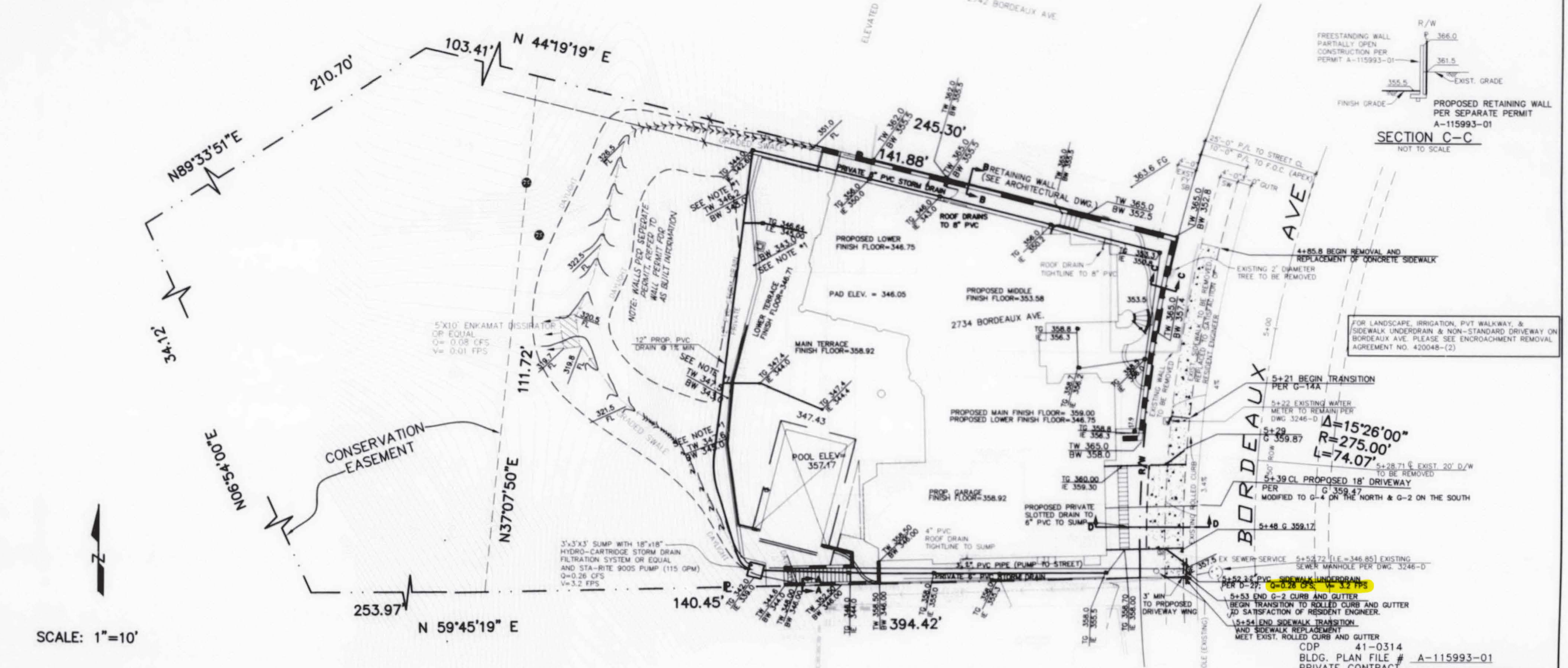
4.- SWALES AND ENKAMAT DISSIPATOR IS PROVIDED AS SAFETY DESIGN TO COLLECT AND DISSIPATE ANY NUISANCE DRAINAGE. THE DESIGN WILL HAVE MINIMUM DISTURBANCE TO THE EXISTING GROUND.

5.- NO OFFSITE GRADING.

NOTE:
PROPERTY LIMITS ARE TO CANYON.
THIS AREA NOT SHOWN AS THERE IS NO GRADING OR ACTIVITY PROPOSED IN THIS AREA.

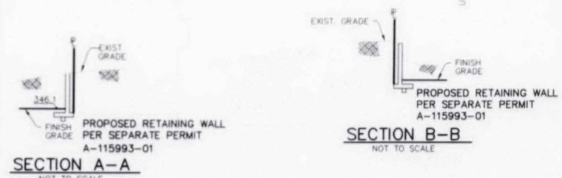
FOR CONSERVATION EASEMENT ON BORDEAUX AVENUE. SEE DWG. NO. 19760-B





SCALE: 1"=10'

CDP 41-0314
BLDG. PLAN FILE # A-115993-01
PRIVATE CONTRACT



ALGERT ENGINEERING, INC.
428 BROADWAY
CHULA VISTA, CA. 91910
TEL. (619) 420-7090
FAX. (619) 420-9139

JN 5680

REGISTERED PROFESSIONAL ENGINEER JAMES H. ALGERT No. 19073 Exp. 9-30-05 CIVIL STATE OF CALIFORNIA
5-28-02

NOTES:
*1. RESTRAINING WALL PER ARCHITECTURAL/STRUCTURAL PLAN PER SEPARATE PERMIT A-115993-01.

NOTE:
RETAINING WALLS SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY. A SEPARATE BUILDING PERMIT AND INSPECTION WILL BE REQUIRED FROM THE DEVELOPMENT SERVICES DEPARTMENT FOR THEIR CONSTRUCTION.

MARCH 8, 2002

GRADING & IMPROVEMENT PLANS FOR:
2734 BORDEUAX AVENUE

LOT 58 OF MAP NO. 3361

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 2 OF 3 SHEETS

W.O. NO. 420048

FOR CITY ENGINEER — 5/31/02 DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	AEI			
AS BUILT	AEI	SI	11/15/07	

1896-6253
NAD 83C
256-1693
LAMBERT COORDINATES

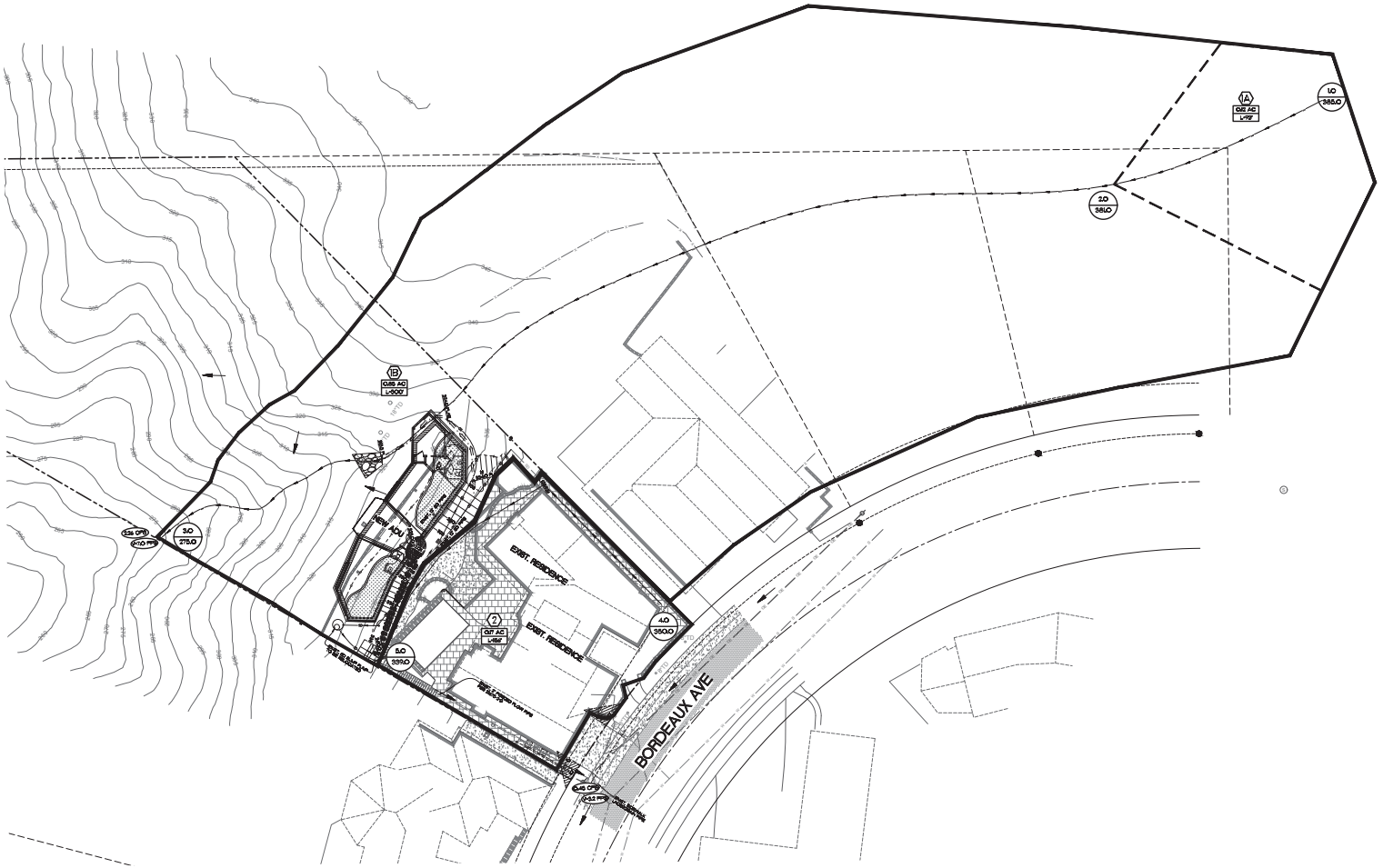
CONTRACTOR SMITH BROTHERS CONST DATE STARTED 6/03/02
INSPECTOR SERGIO INIGUEZ DATE COMPLETED 4/25/07

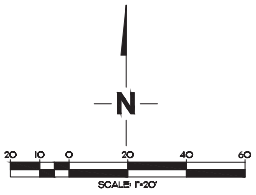
31675-2-D

AS BUILT

JN 5680

POST-CONSTRUCTION DRAINAGE MAP





PRE & POST DEVELOPMENT 100-YR. PEAK DISCHARGES

PRE-DEVELOPMENT							POST-DEVELOPMENT						
BASIN ⬡	TIME OF CONCENTRATION Tc (MIN.)	AREA A (ACRES)	NRCS HYDROLOGIC SOIL TYPE	RUNOFF FACTOR "C"	INTENSITY "I" (INCH/HR)	DISCHARGE Q100 (CFS)	BASIN ⬡	TIME OF CONCENTRATION Tc (MIN.)	AREA A (ACRES)	NRCS HYDROLOGIC SOIL TYPE	RUNOFF FACTOR "C"	INTENSITY "I" (INCH/HR)	DISCHARGE Q100 (CFS)
1A	5.0	0.12	D	0.46	5.796	2.26	1A	5.0	0.12	D	0.46	5.796	2.26
1B	6.18	0.85	D	0.46	5.054		1B	6.18	0.85	D	0.46	5.054	
2	5.0	0.17	D	0.46	5.796	0.45	2	5.0	0.17	D	0.46	5.796	0.45
					TOTAL = 2.71 CFS							TOTAL = 2.71 CFS	

LEGEND

- BASIN ID NO. ..... (1)
- DRAINAGE BASIN BOUNDARY .....
- FLOW PATH .....
- STUDY NODE W/ ELEVATION ..... 1.0 / 385.0
- BASIN AREA W/ FLOW LENGTH ..... 0.46 AC / L=280'
- DIRECTION OF FLOW .....
- 100-YEAR PEAK DISCHARGE ..... 1.06 CFS

ENGINEER OF WORK

SON—Engineering
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P.O. BOX 1707, ALPINE, CA 91903
(619) 270-9378, son@soncivil.com
SON P. NGUYEN R.C.E. 86249
EXPIRES 03-31-25

REGISTERED PROFESSIONAL ENGINEER — SON P. NGUYEN — C 86249 Exp. 03-31-25 CIVIL — STATE OF CALIFORNIA

STAMP

BORDEAUX AVENUE ADU

2734 Bordeaux Avenue, La Jolla, CA 92037

REVISIONS

NO.	DESCRIPTION	DATE
01	REVIEW CYCLE	10/17/2024

SHEET NAME

PROJECT NO. SON2404-04
DATE: 25 APRIL, 2024
DRAWN BY: SON
CHECKED BY: SON
SHEET NUMBER

PRE-DEVELOPMENT
DRAINAGE CALCULATIONS

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

              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 1745

                          Analysis prepared by:
```


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(619) 770-9339
son@soncivil.com


```
 ************************** DESCRIPTION OF STUDY **************************
* BORDEAUX AVE ADU                                                       *
* PRE-DEVELOPMENT CONDITIONS                                             *
* COASTAL DEVELOPMENT PERMIT                                             *
 **************************************************************************

  FILE NAME: S0404.DAT
  TIME/DATE OF STUDY: 14:52 04/30/2024
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.200
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =  84
  USER SPECIFIED Tc(MIN.) =    5.000
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    381.00
  DOWNSTREAM NODE ELEVATION(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.120
  PAVEMENT LIP(FEET) =  0.120   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.12000
  MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.054
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =  84
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.04
  AVERAGE FLOW DEPTH(FEET) =   0.24   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =    6.18
  SUBAREA AREA(ACRES) =    0.85       SUBAREA RUNOFF(CFS) =    1.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.460
  TOTAL AREA(ACRES) =        1.0         PEAK FLOW RATE(CFS) =       2.26

         NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL
         DEPTH EQUAL TO [GUTTER-HIKE + PAVEMENT LIP]

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   7.04   DEPTH*VELOCITY(FT*FT/SEC) =   1.69
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     500.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =  84
  USER SPECIFIED Tc(MIN.) =    5.000
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.45
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.2  TC(MIN.) =      5.00
  PEAK FLOW RATE(CFS)   =       0.45
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

POST-DEVELOPMENT DRAINAGE CALCULATIONS

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

          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 1745
```


Analysis prepared by:

SON-Engineering

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(619) 770-9339
son@soncivil.com


```
 ************************** DESCRIPTION OF STUDY **************************
* BORDEAUX AVE ADU                                                       *
* POST-DEVELOPMENT CONDITIONS                                            *
* COASTAL DEVELOPMENT PERMIT                                             *
 ************************************************************************

  FILE NAME: S0404A.DAT
  TIME/DATE OF STUDY: 16:23 09/06/2024
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.200
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  22
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =  84
  USER SPECIFIED Tc(MIN.) =    5.000
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
 SUBAREA RUNOFF(CFS) =      0.32
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
 FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =    381.00
 DOWNSTREAM NODE ELEVATION(FEET) =    275.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   500.00
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.120
 PAVEMENT LIP(FEET) =  0.120   MANNING'S N = .0300
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.12000
 MAXIMUM DEPTH(FEET) =   5.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.054
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =  84
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.04
 AVERAGE FLOW DEPTH(FEET) =   0.24   FLOOD WIDTH(FEET) =    5.00
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =    6.18
 SUBAREA AREA(ACRES) =    0.85       SUBAREA RUNOFF(CFS) =    1.98
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.460
 TOTAL AREA(ACRES) =        1.0         PEAK FLOW RATE(CFS) =       2.26
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.24   FLOOD WIDTH(FEET) =    5.00
 FLOW VELOCITY(FEET/SEC.) =   7.04   DEPTH*VELOCITY(FT*FT/SEC) =   1.69
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1000.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .4900
  S.C.S. CURVE NUMBER (AMC II) =  85
  USER SPECIFIED Tc(MIN.) =    5.000
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.48
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.2  TC(MIN.) =      5.00
  PEAK FLOW RATE(CFS)   =       0.48
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HYDRAULIC CALCULATIONS

FLOW DEPTH IN DRAINAGE DITCH

Channel Report

Project Name: BORDEAUZ AVE ADU

Studio Express by Hydrology Studio v 1.0.0.15

09-06-2024

Drainage Ditch

Channel 1

PARABOLIC

Top Width	= 3.00 ft
Total Depth	= 1.50 ft
Invert Elevation	= 325.00 ft
Channel Slope	= 0.200 %
Manning's n	= 0.015

DISCHARGE

Method	= Known Q
Known Q	= 2.26 cfs

CALCULATION SAMPLE

Flow	Depth	Area	Velocity	WP	n-value	Crit Depth	HGL	EGL	Max Shear	Top Width
(cfs)	(ft)	(sqft)	(ft/s)	(ft)		(ft)	(ft)	(ft)	(lb/sqft)	(ft)
2.26	0.73	1.02	2.22	2.77	0.015	0.55	325.73	325.81	0.09	2.09