HYDROLOGY STUDY
FOR

1515 4th Street
San Rafael, CA 94901

Prepared For:
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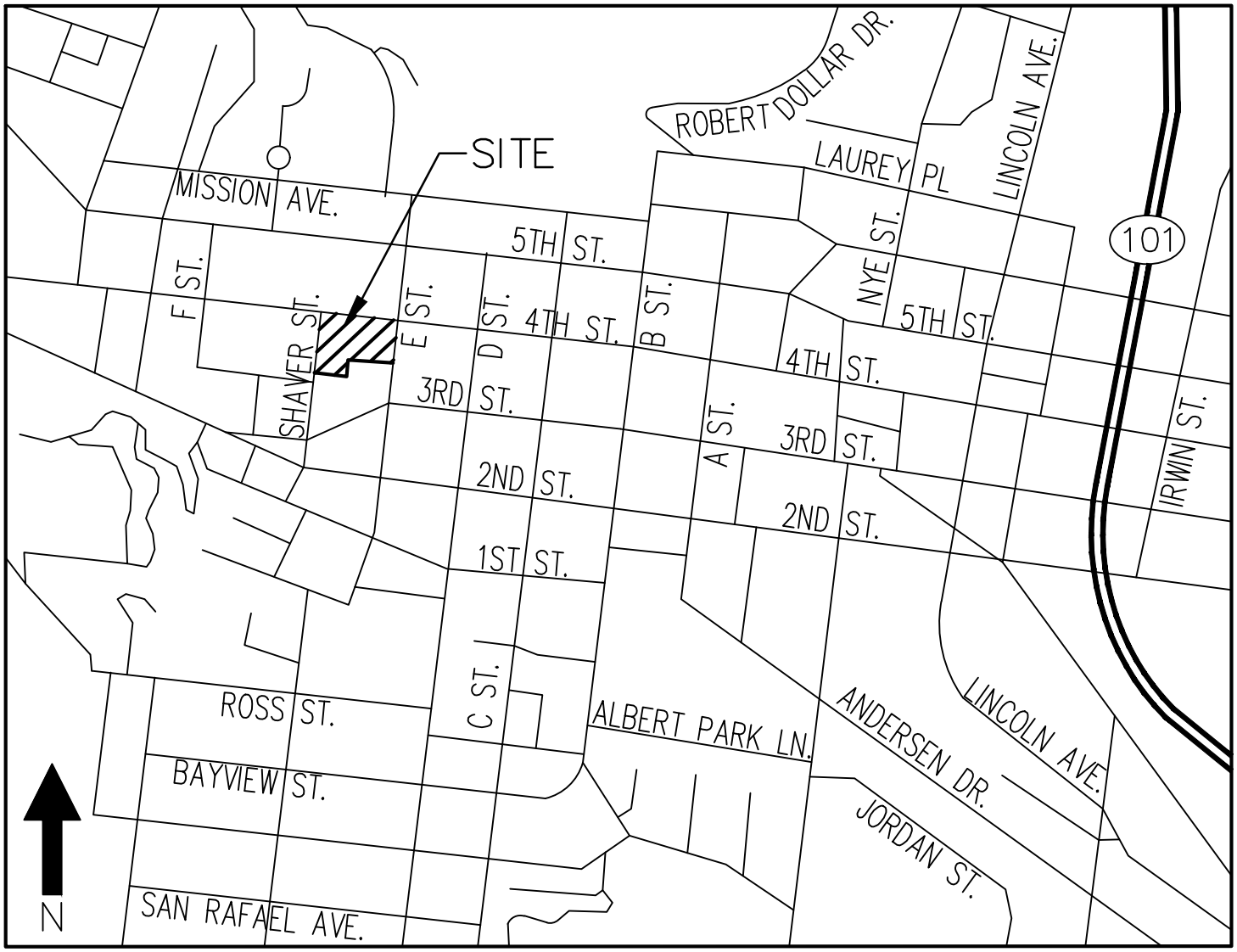
I. VICINITY MAP



VICINITY MAP

N.T.S.

II. SOILS AND RAIN FALL INTENSITY MAPS

From County of Marin Dept. of Public Works Hydrology Manual
Soil Type: 15

SOIL ASSOCIATIONS

SOILS ON ALLUVIAL FANS AND PLAINS, IN BASINS, AND ON TIDAL FLATS

1 — Blucher-Cole: Very deep, gently sloping, somewhat poorly drained soils; in basins and on alluvial fans

2 — Reyes-Novato: Very deep, nearly level, somewhat poorly drained and very poorly drained soils; on tidal flats

3 — Urban land-Xerorthents: Urban land, and deep, nearly level to moderately sloping soils; on alluvial fans, alluvial plains, and tidal flats

4 — Xerorthents-Urban land: Deep, nearly level to sloping soils, and Urban land; on alluvial fans, alluvial plains, and tidal flats

COASTAL SOILS ON DUNES, TERRACES, HILLS, MOUNTAINS, AND UPLANDS

5 — Dune land-Sirdrak: Dune land, and very deep, gently sloping to steep, somewhat excessively drained soils; on coastal dunes

6 — Kehoe-Sheridan Variant: Moderately deep, strongly sloping to very steep, well drained soils underlain by sandstone and quartz-diorite; on hills

7 — Palomarin-Wittenberg: Deep, strongly sloping to very steep, well drained soils underlain by siliceous shale and sandstone; on hills and mountains

8 — Pablo-Bayview: Shallow, moderately steep to very steep, well drained soils underlain by siliceous shale and sandstone; on uplands

9 — Cronkhite-Dipsea-Centissima: Moderately deep and deep, strongly sloping to very steep, moderately well drained and well drained soils underlain by sandstone and shale; on uplands

10 — Tamalpais-Barnabe Variant: Shallow and moderately deep, moderately steep to very steep, well drained soils underlain by chert and sandstone; on uplands

11 — Tomales-Steinbeck: Deep, gently sloping to steep, moderately well drained and well drained soils underlain by soft sandstone; on uplands

12 — Olompali-Soulajule-Felton Variant: Moderately deep and deep, gently sloping to very steep, somewhat poorly drained and well drained soils; on terraces and uplands

INLAND SOILS ON UPLANDS

13 — Tocaloma-Saurin: Moderately deep, gently sloping to very steep, well drained soils underlain by sandstone and shale; on uplands

14 — Los Osos-Bonnydoon: Shallow and moderately deep, gently sloping to very steep, well drained and somewhat excessively drained soils underlain by sandstone and shale; on uplands

15 — Tocaloma-McMullin: Shallow and moderately deep, moderately steep to very steep, well drained soils underlain by sandstone and shale; on uplands

16 — Maymen-Maymen Variant: Shallow and moderately deep, steep and very steep, somewhat excessively drained and well drained soils underlain by sandstone and shale; on uplands

17 — Tocaloma-McMullin-Urban land: Moderately deep and shallow, well drained, moderately steep to very steep soils underlain by sandstone and shale, and Urban land; on uplands

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

Compiled 1983

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXPERIMENT STATION

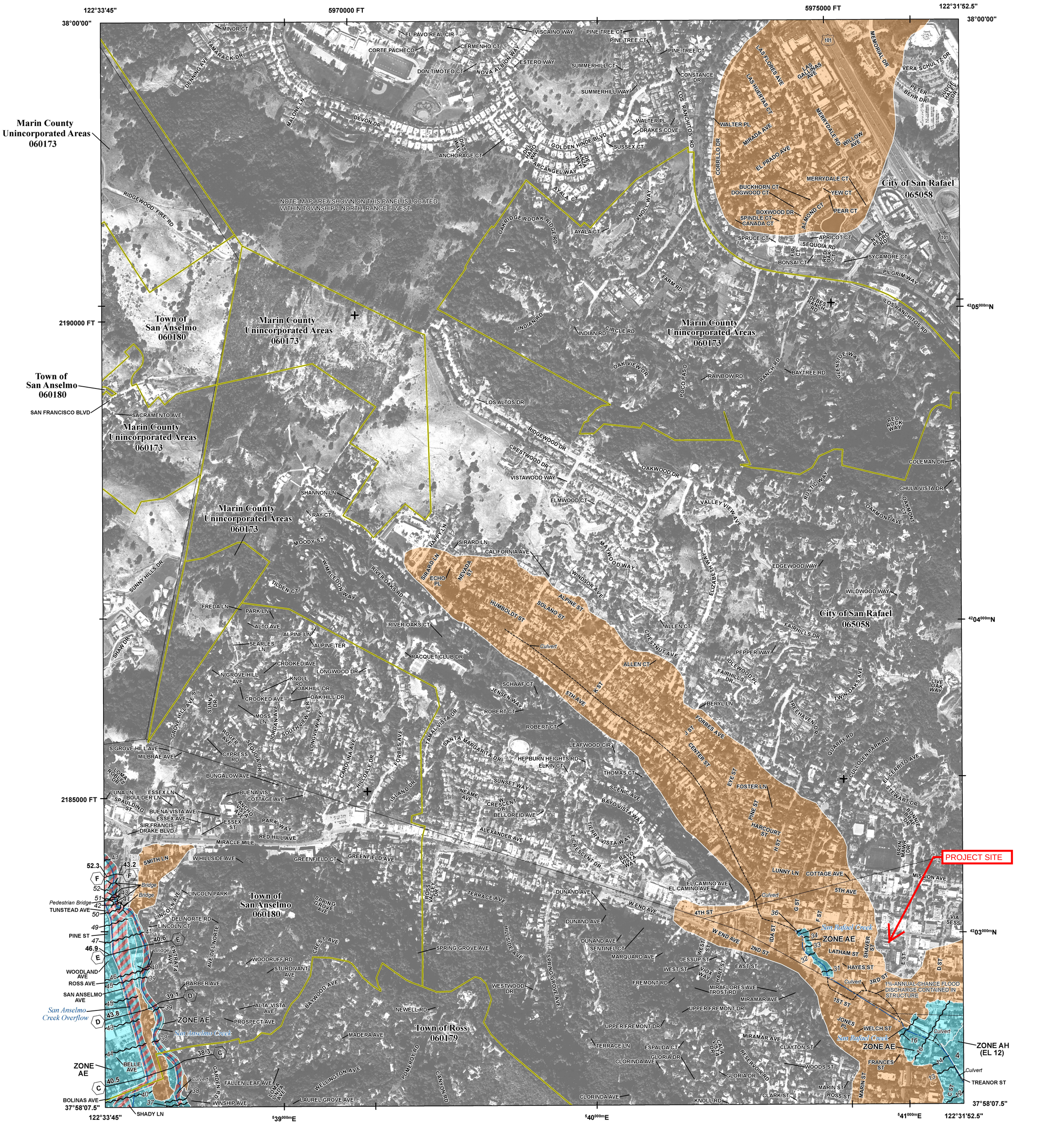
GENERAL SOIL MAP

MARIN COUNTY, CALIFORNIA

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

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

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

OTHER AREAS
- NO SCREEN Areas of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike or Floodwall
- Non-accredited Levee, Dike or Floodwall
- 18.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation (BFE)
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)

OTHER FEATURES
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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

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

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

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

Base map information shown on this FIRM was derived from Coastal California LiDAR and Digital Imagery dated 2011. USDA NAIP 2012 imagery is used in areas not covered by the Coastal California imagery.

SCALE

N

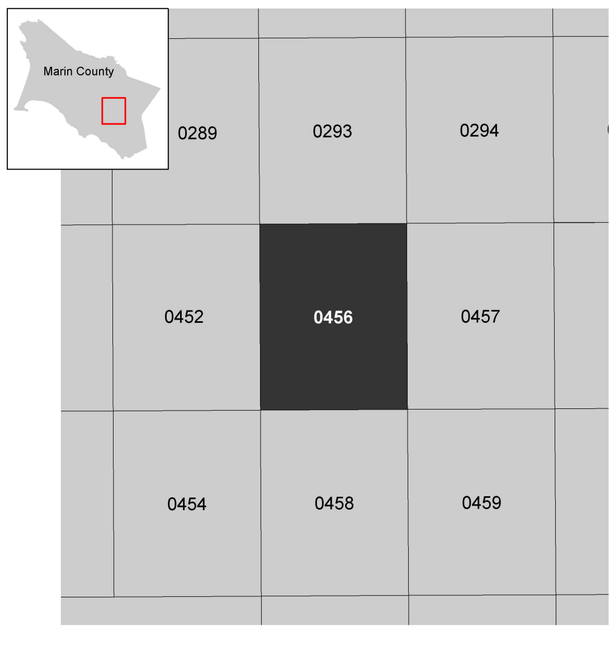
Map Projection:
Universal Transverse Mercator Zone 10N; North American Datum 1983;
Western Hemisphere; Vertical Datum: North American Vertical Datum of 1988

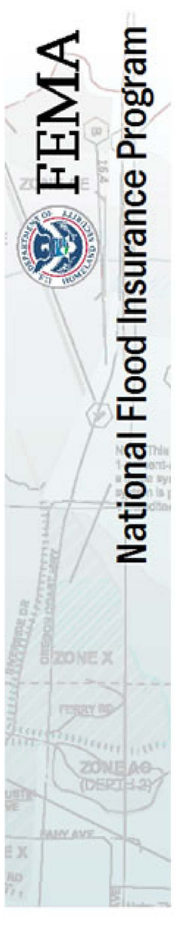
1 inch = 500ft 1:6,000

0 250 500 750 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR





NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

MARIN COUNTY, CALIFORNIA
and Incorporated Areas

PANEL 456 OF 531

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARIN COUNTY	060173	0456	F
ROSS, TOWN OF	060179	0456	F
SAN ANSELMO, TOWN OF	060180	0456	F
SAN RAFAEL, CITY OF	065058	0456	F

VERSION NUMBER
2.3.2.0

MAP NUMBER
06041C0456F

MAP REVISED
MARCH 16, 2016

III. DISCUSSION

III. DISCUSSION

Introduction

The purpose of the attached analysis is to determine the existing and proposed storm water discharge flow for the project. The project is located at 1515 4th Street, San Rafael, CA. The project is bound by 4th Street on the northern front, Shaver Street on the eastern front, E Street on the west and commercial properties neighboring on the south.

The project site is 0.88 acres and currently consists of an office structure.

This hydrology report will calculate the 10 and 100-year storm water runoff for this location.

Existing Conditions

The current site houses a former bank branch, parking lot, and associated improvements such as landscaping, hardscaping, and driveways. The site currently drains from the north east, down towards the south west portion of the site. Flows then exit the site through perforated drainpipes located withing the existing wall, at which point flows end up on Shaver Street.

Project Description

The project proposes the complete redevelopment of the site, this will include the demolition of the existing building and parking lot. It will we replaced with a mix use residential/ commercial building. The proposed project will consist of 207 residential units and approximately 5,000 sf of commercial space. Site will also feature a courtyard and common areas throughout along with underground parking. Associated improvements such as landscaping and bioretention areas for the purposes of stormwater quality will be included.

Hydrology and Calculation Methodology

The hydrology study was performed utilizing County of Marin Public Works Hydrology Manual Simplified Instructions method.

Conclusion

The proposed project will be redeveloping the entirety of the existing site to build a new 6-story hotel structure. The project Q10 flows will decrease from existing to proposed while the Q100 flows increase by 4 percent from existing to proposed as shown in the table below and in the hydrology maps attached.

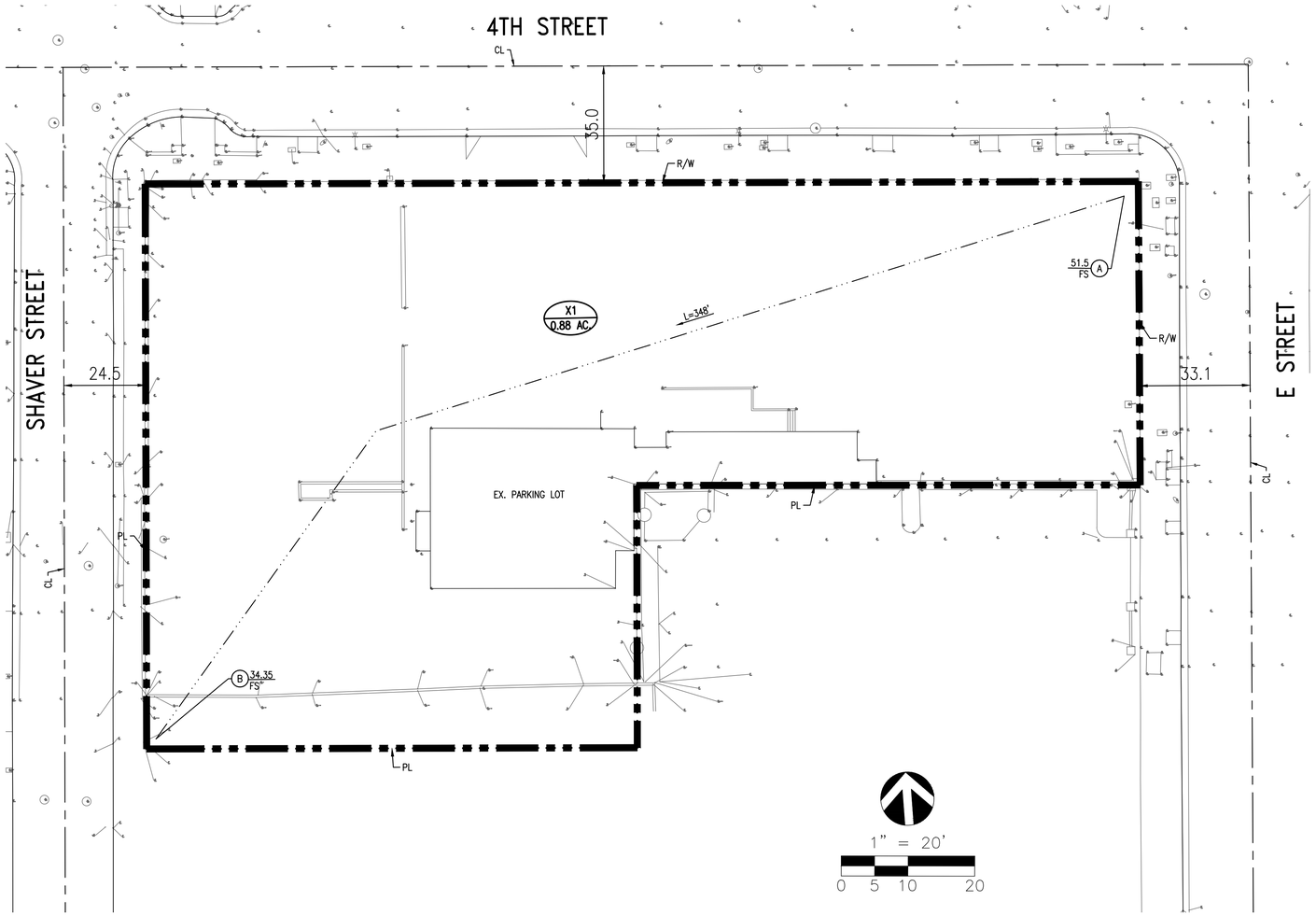
A table of pre- and post-construction flows can be seen in the table below:

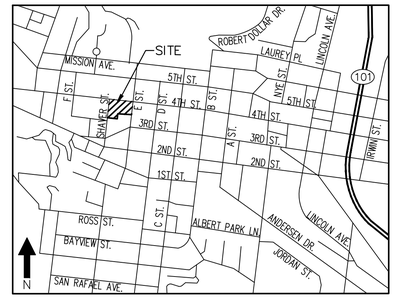
Condition	10-YR Flow (cfs)	100-YR Flow (cfs)
Pre-Developed Condition	1.69	2.71
Post-Developed Condition	1.47	2.83
Percent Change	-13%	+4.4%

IV. 10 & 100-YEAR HYDROLOGY CALCULATIONS – EXISTING DEVELOPED CONDITION

V. HYDROLOGY MAP-EXISTING AND DEVELOPED CONDITIONS

DRAINAGE EXHIBIT
EXISTING CONDITIONS





VICINITY MAP
N.T.S.

FLOOD NOTE:
PROJECT IS LOCATED IN ZONE X
PER FEMA MAP# 06041C0456F

LEGEND:

X1 / 0.00 AC	SUB-AREA NUMBER / ACREAGE
	MAJOR-AREA BOUNDARY PROPERTY LINE
	SUB-AREA BOUNDARY
	FLOW PATH
(X)	NODE

OFFSITE FLOW NOTE:
THERE ARE NO OFFSITE FLOWS DISCHARGING THROUGH THE SITE IN EXISTING OR PROPOSED CONDITIONS.

SOIL TYPE: 15

PRE DEVELOPMENT:

X1 = 0.88 AC.
PERVIOUS AREA = 0.053 AC. (6%)
IMPERVIOUS AREA = 0.827 AC. (94%)

$Q_{10Y\%24HR}$ = 1.69 CFS
$Q_{100Y\%24HR}$ = 2.71 CFS

REGISTERED PROFESSIONAL ENGINEER
ALI MONSHIZADEH
C67674
EXP. 06/30/2023
CIVIL
STATE OF CALIFORNIA

PLAN PREPARED BY:
MFKessler
Civil Engineering, Land Planning, Surveying
ONE VENTURE, SUITE 130
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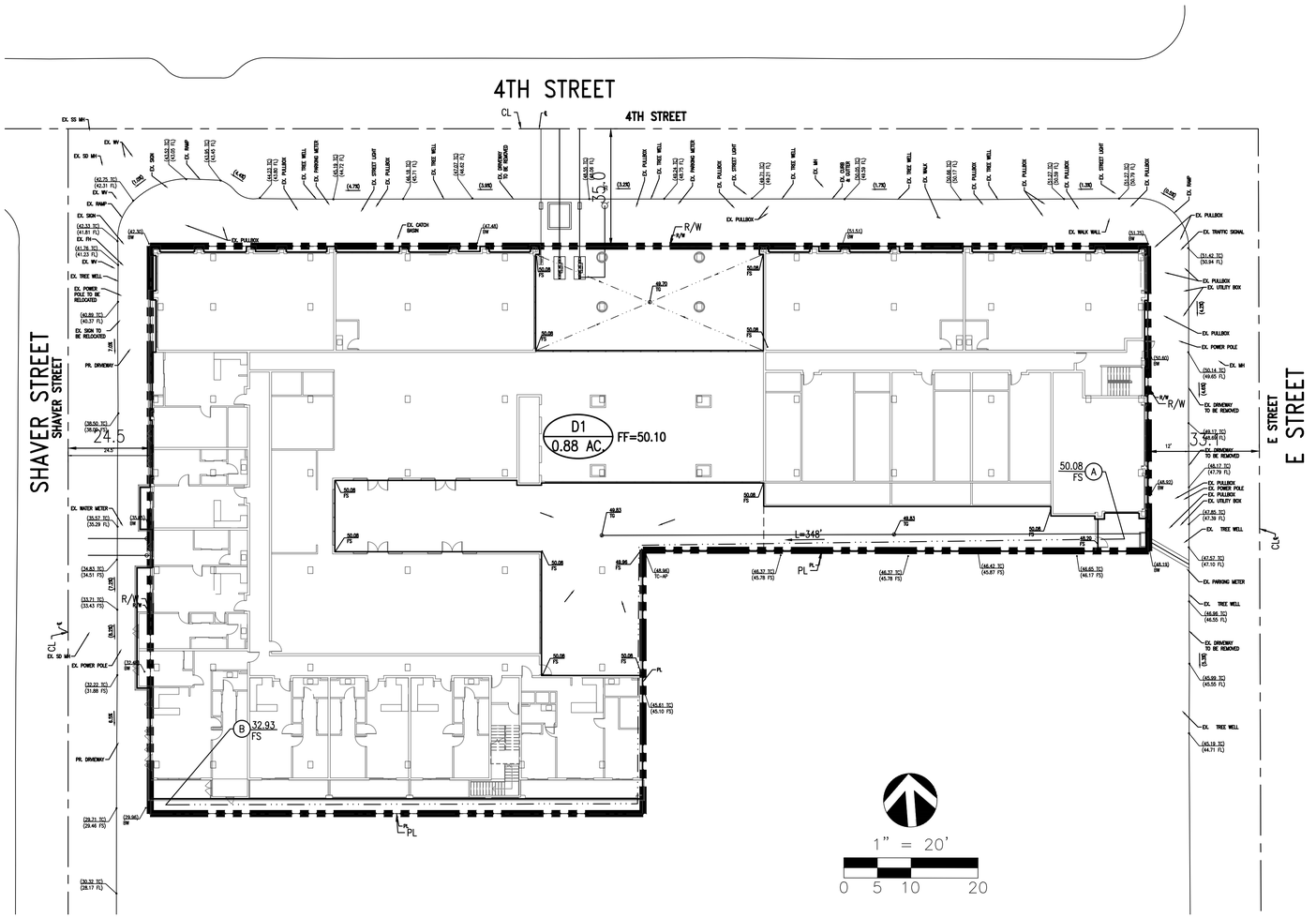
(949) 339-5330
MFKESSLER.COM

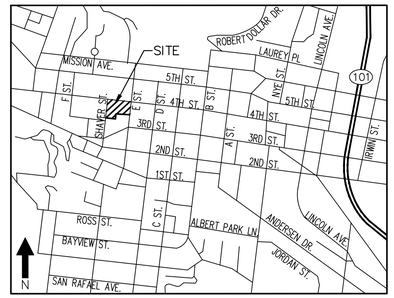
CITY OF SAN RAFAEL

EXISTING DRAINGE EXHIBIT
1515 4TH AVE.
SAN RAFAEL, CA 94901

SHEET
1 OF 1

DRAINAGE EXHIBIT
DEVELOPED CONDITIONS





VICINITY MAP
N.T.S.

FLOOD NOTE:
PROJECT IS LOCATED IN ZONE X
PER FEMA MAP# 06041C0456F

FLOOD NOTE:
PROJECT IS LOCATED IN ZONE X
PER FEMA MAP# 06041C0456F

LEGEND:

- D1 / 0.00 AC — SUB-AREA NUMBER / ACREAGE
- MAJOR-AREA BOUNDARY PROPERTY LINE
- SUB-AREA BOUNDARY
- FLOW PATH
- (X) NODE

OFFSITE FLOW NOTE:
THERE ARE NO OFFSITE FLOWS DISCHARGING THROUGH THE SITE IN EXISTING OR PROPOSED CONDITIONS.

SOIL TYPE: 15

POST DEVELOPMENT:

D1 = 0.88 AC.
PERVIOUS AREA = 0.08 AC. (10%)
IMPERVIOUS AREA = 0.80 AC. (90%)

$Q_{10YR\text{-}24HR}$ = 1.47 CFS
$Q_{100YR\text{-}24HR}$ = 2.83 CFS

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SHEET
1 OF 1