

TORRANCE APARTMENTS
22501 Hawthorne Blvd
City of Torrance, CA

PRELIMINARY HYDROLOGY REPORT
December 16, 2021

Prepared For:

Intracorp Homes
895 Dove, Suite 400
Newport Beach, CA 92660

Prepared By:



URBAN RESOURCE
CONSULTING CIVIL ENGINEERS

Urban Resource Corporation
2923 Saturn Street, Unit H
Brea, CA 92821

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Terry P. Au, P.E.
State of California No. 68466

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INTRODUCTION

The following site is located at 22501 Hawthorne Blvd in the City of Torrance and is in the County of Los Angeles. The site is bounded by Hawthorne Blvd to the east, W. 226th Street to the south, existing residential to the west and existing retail/commercial/office to the north.

The existing site consists of three retail/commercial buildings, parking lot and landscape improvements with original improvements dating back to 1959. The site imperviousness is estimated to be 99%.

This project is approximately 3.8 acres consisting of one Parcel, Lot 11 of Tract 454. The proposed development is for multi-family residential and commercial retail, including a parking garage, three courtyards, lobby/leasing center, and open plaza. The approximate project imperviousness is 85%.

The existing site topography is relatively flat and generally drains from the northeast to the southwest with site elevations ranging from 82el. to 77el. across the site. Post development conditions will maintain pre-development drainage patterns and development flows will be conveyed via surface flows and pipe flows and outlet into the street gutter via parkway drains (or similar), and into Hawthorne Blvd and/or W. 226th Street. Project peak storm flows are ultimately captured by an existing catch basin in Ocean Avenue, south of W. 226th Street, where existing site drainage currently drains to. Water quality flows will be routed via storm drains lines to the proposed onsite infiltration and storage system.

A small drainage area of approximately 0.2 acres from the existing apartment site along the westerly project boundary drains onto this existing site; and its drainage area flows will be maintained and will flow through wall openings in the proposed boundary wall at the southwest corner of the project. These flows will continue to drain into W. 226th Street and is not treated onsite. Its' drainage subarea is denoted as Subarea B in the proposed condition hydrology study. This drainage subarea is included in the total drainage area for Subarea A in the existing condition hydrology study.

This study is prepared to analyze the proposed development condition and existing condition hydrology; and to determine if this development will increase peak flow rates for the 50-year and 10-year storm events relative to the existing condition.

METHODOLOGY

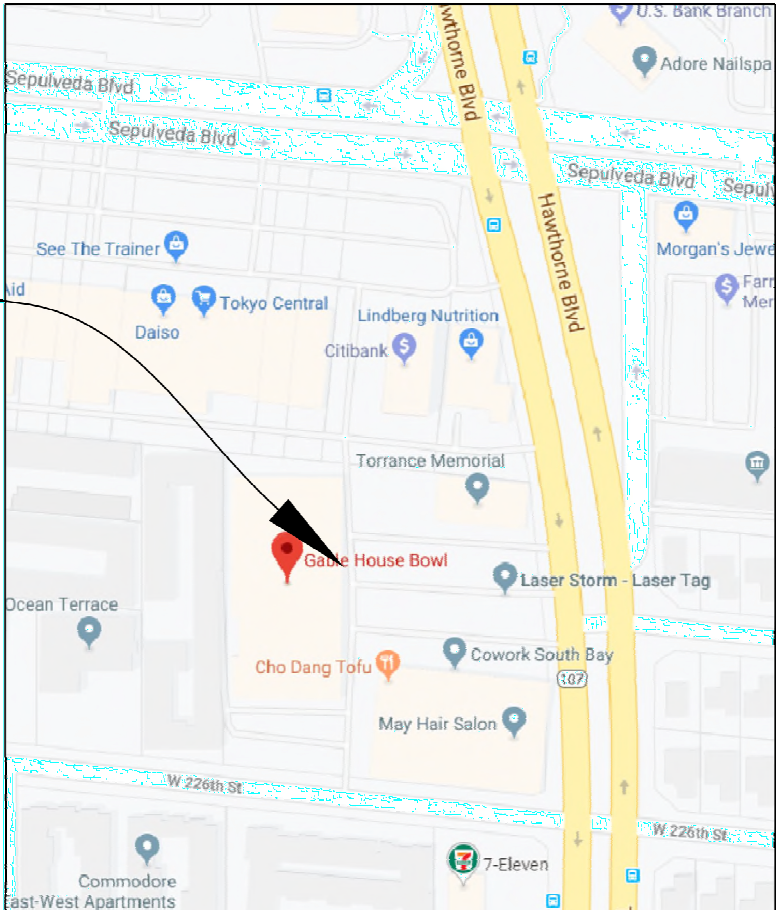
The January 2006 Los Angeles County Department of Public Works Hydrology Manual was used for analysis on this project. The Los Angeles Isohyet map indicates that the 10-year, 24-hour precipitation is 4.00 inches, 50-year, 24-hour precipitation is 5.60 inches, and the soil classification area is 010, per Isohyet 1-H1.4.

Hydrology analysis has been calculated with the use of HydroCalc as provided by the County of Los Angeles Public Works.

CONCLUSION

Based on Hydrocalc results herewith, there will be a decrease in storm flows in the developed condition for the 50-year and 10-year storm events. The Q50 runoff is 7.38cfs in the proposed condition and 9.13cfs in the existing condition. The Q10 runoff is 4.61cfs in the proposed condition and 5.68cfs in the existing condition. Therefore, this development will have a negligible impact to the existing downstream storm drain system.

PROJECT LOCATION



VICINITY MAP

II. REFERENCES

1. Hydrology Manual, Los Angeles County Department of Public Works, January 2006.
2. Low Impact Development Standards Manual, Los Angeles County Department of Public Works, February 2014.
3. HydroCalc Version 1.0.3, Los Angeles County Department of Public Works, Released 2/21/2018.

APPENDICES

APPENDIX A – HYDROLOGY CALCULATIONS

Peak Flow Hydrologic Analysis

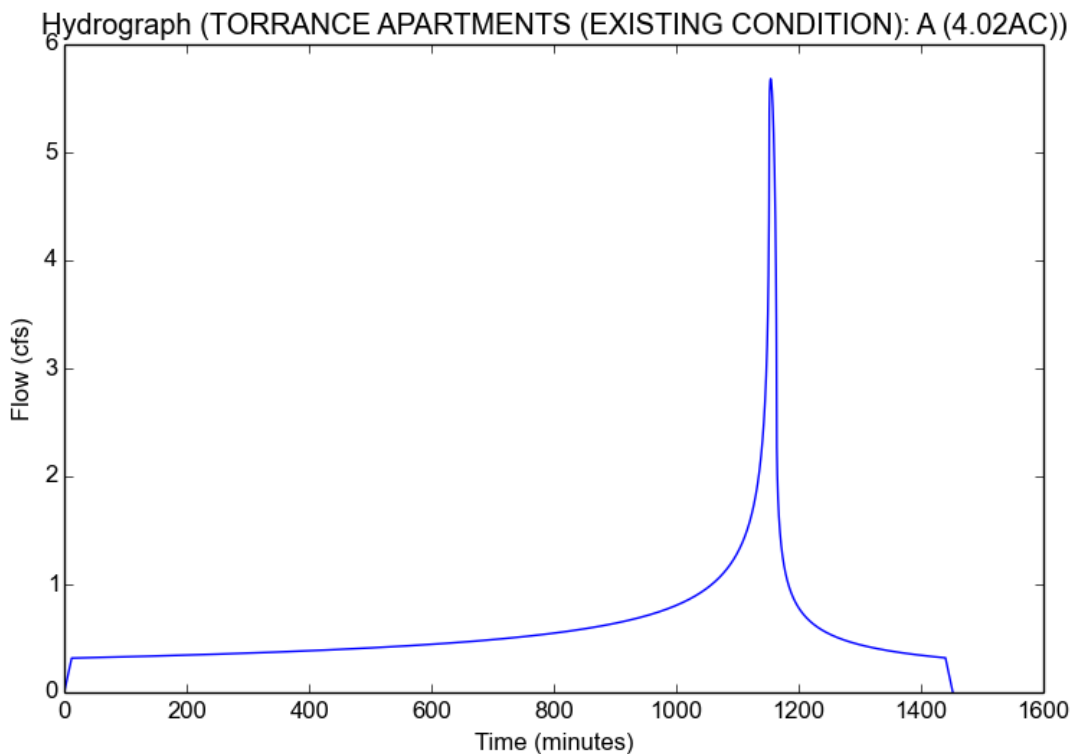
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	TORRANCE APARTMENTS (EXISTING COND
Subarea ID	A (4.02AC)
Area (ac)	4.02
Flow Path Length (ft)	620.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.6
Percent Impervious	0.99
Soil Type	10
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.9984
Peak Intensity (in/hr)	1.5808
Undeveloped Runoff Coefficient (Cu)	0.3082
Developed Runoff Coefficient (Cd)	0.8941
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	5.6819
Burned Peak Flow Rate (cfs)	5.6819
24-Hr Clear Runoff Volume (ac-ft)	1.1851
24-Hr Clear Runoff Volume (cu-ft)	51623.2516



Peak Flow Hydrologic Analysis

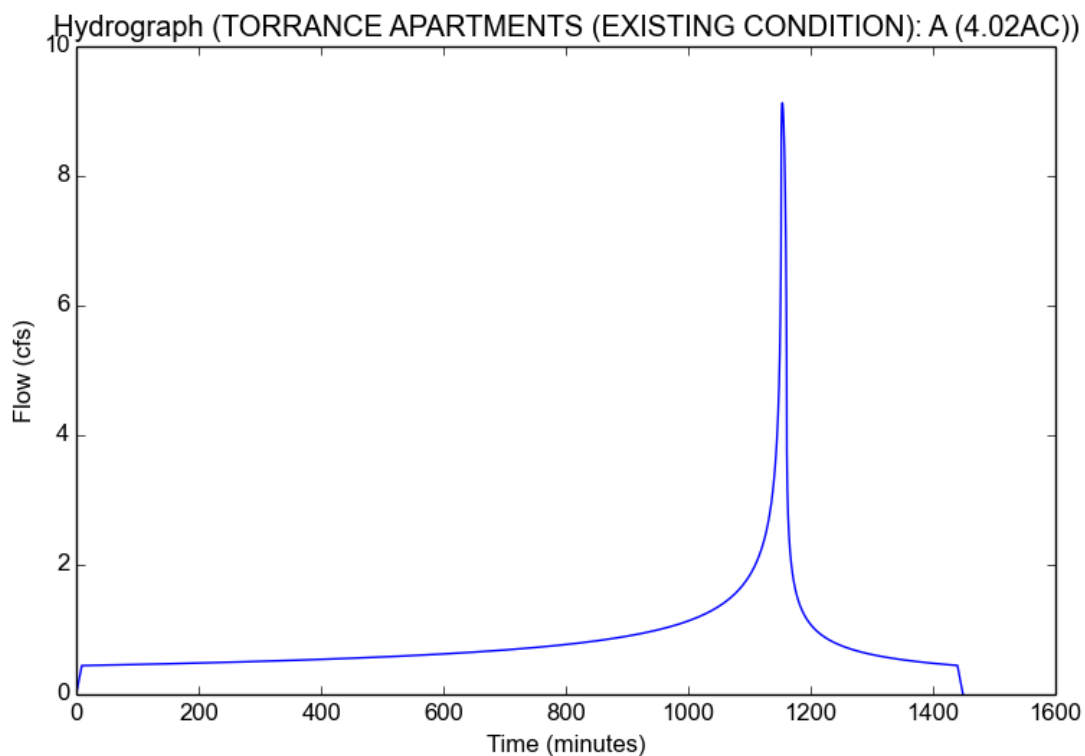
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	TORRANCE APARTMENTS (EXISTING COND
Subarea ID	A (4.02AC)
Area (ac)	4.02
Flow Path Length (ft)	620.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.6
Percent Impervious	0.99
Soil Type	10
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.6
Peak Intensity (in/hr)	2.5346
Undeveloped Runoff Coefficient (Cu)	0.4875
Developed Runoff Coefficient (Cd)	0.8959
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	9.1282
Burned Peak Flow Rate (cfs)	9.1282
24-Hr Clear Runoff Volume (ac-ft)	1.6601
24-Hr Clear Runoff Volume (cu-ft)	72312.5231



Peak Flow Hydrologic Analysis

File location: P:/278.737/HYDROLOGY/PRELIMINARY HYDROLOGY/HYDROCALC CALCULATIONS/PREL HYD_PR CALCS 10YR.pdf
Version: HydroCalc 1.0.3

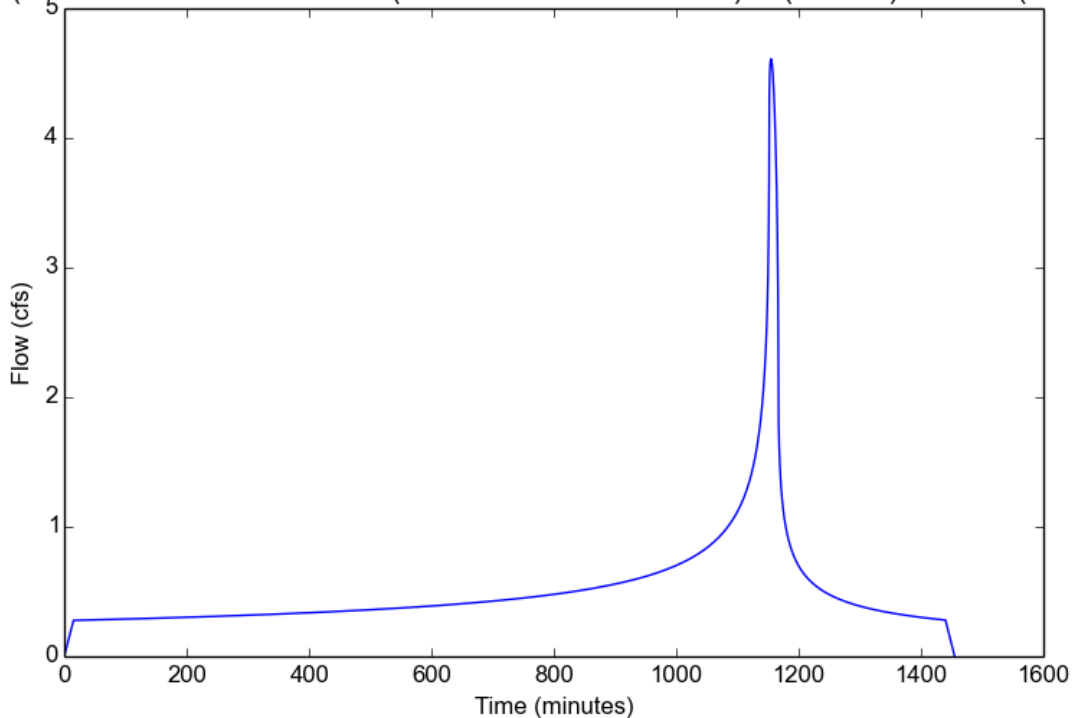
Input Parameters

Project Name	TORRANCE APARTMENTS (PROPOSED CONDITION)
Subarea ID	A (3.82AC) PLUS B (0.2AC OFFSITE)
Area (ac)	4.02
Flow Path Length (ft)	815.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.6
Percent Impervious	0.85
Soil Type	10
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.9984
Peak Intensity (in/hr)	1.4235
Undeveloped Runoff Coefficient (Cu)	0.2712
Developed Runoff Coefficient (Cd)	0.8057
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	4.6103
Burned Peak Flow Rate (cfs)	4.6103
24-Hr Clear Runoff Volume (ac-ft)	1.0384
24-Hr Clear Runoff Volume (cu-ft)	45233.96

Graph (TORRANCE APARTMENTS (PROPOSED CONDITION): A (3.82AC) PLUS B (0.2AC



Peak Flow Hydrologic Analysis

File location: P:/278.737/HYDROLOGY/PRELIMINARY HYDROLOGY/HYDROCALC CALCULATIONS/PREL HYD_PR CALCS 50YR.pdf
Version: HydroCalc 1.0.3

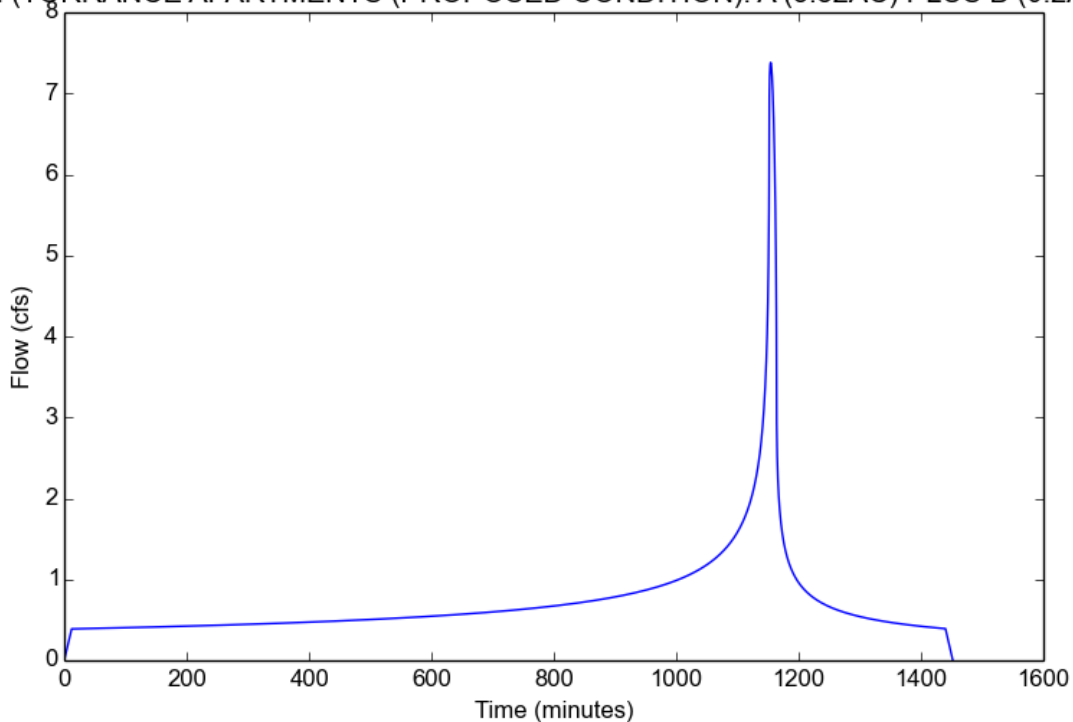
Input Parameters

Project Name	TORRANCE APARTMENTS (PROPOSED CONDITION)
Subarea ID	A (3.82AC) PLUS B (0.2AC OFFSITE)
Area (ac)	4.02
Flow Path Length (ft)	815.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.6
Percent Impervious	0.85
Soil Type	10
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.6
Peak Intensity (in/hr)	2.2141
Undeveloped Runoff Coefficient (Cu)	0.4285
Developed Runoff Coefficient (Cd)	0.8293
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	7.3811
Burned Peak Flow Rate (cfs)	7.3811
24-Hr Clear Runoff Volume (ac-ft)	1.4582
24-Hr Clear Runoff Volume (cu-ft)	63518.5766

Graph (TORRANCE APARTMENTS (PROPOSED CONDITION): A (3.82AC) PLUS B (0.2AC



APPENDIX B – SUPPORTING DOCUMENTS

PROJECT LOCATION

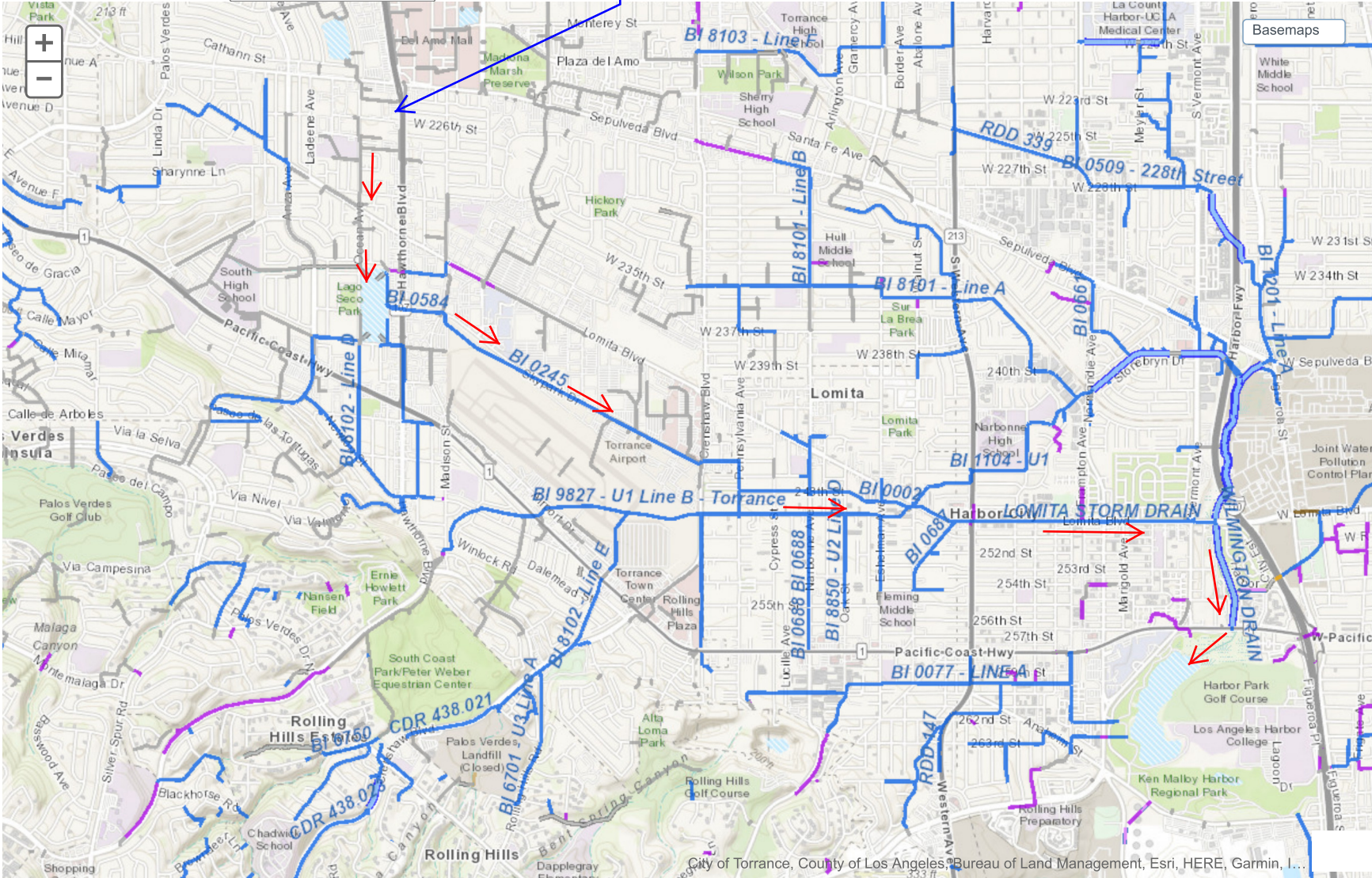
search our site..

Los Angeles County Storm Drain System

File Geodatabase Download

Search Layers Info

- Drains Maintained by LACFCD City Road Metro/Parks & Recreation Private/Permittee/Others Caltrans Unknown Channels Catch Basins Maintenance Holes



City of Torrance, County of Los Angeles, Bureau of Land Management, Esri, HERE, Garmin, I...

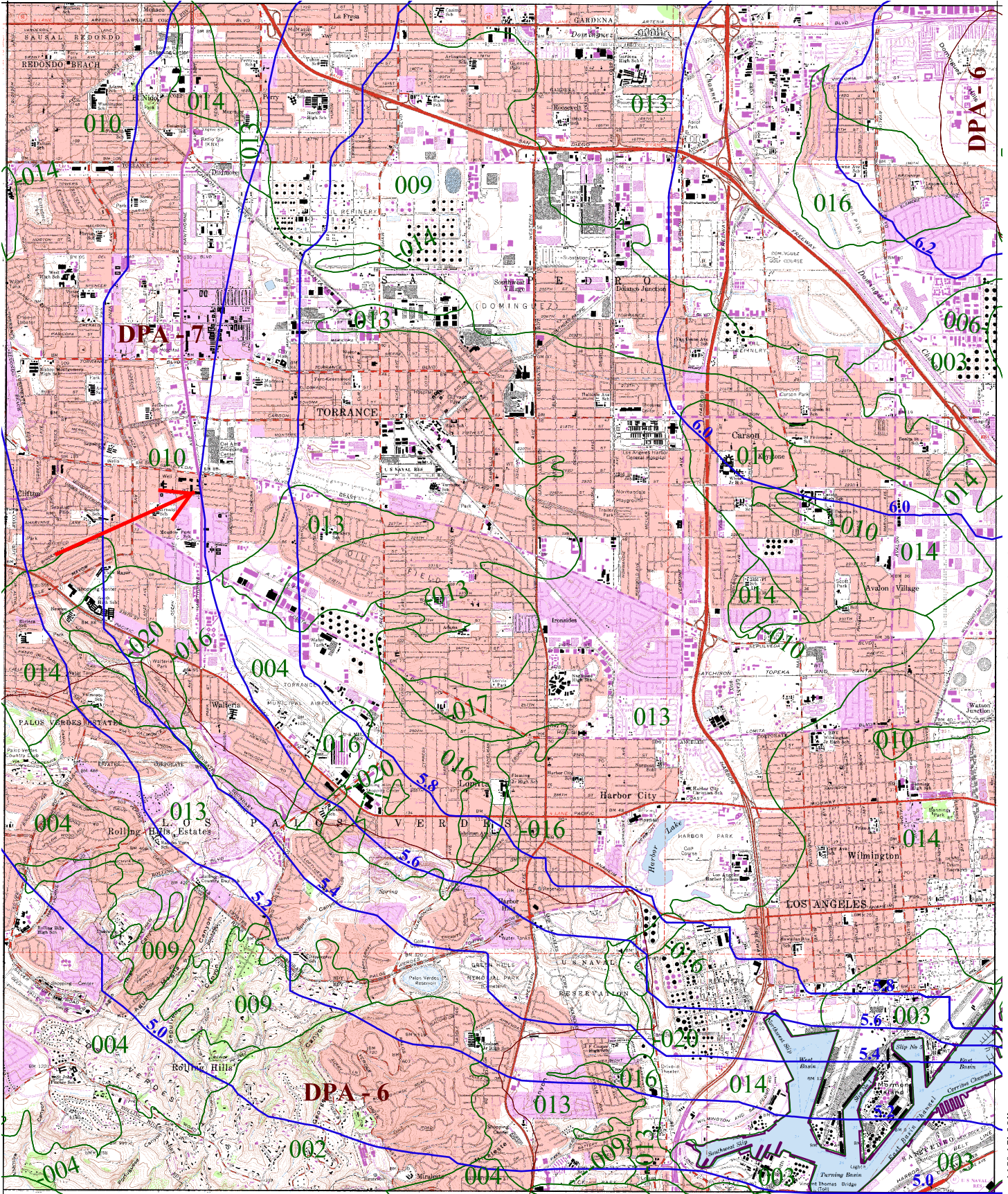
33° 52' 30"

INGLEWOOD 1-H1.8

-118° 22' 30"

REDONDO BEACH 1-H1.3

LONG BEACH 1-H1.5



-118° 15' 00"

SAN PEDRO 1-H1.2

33° 45' 00"



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

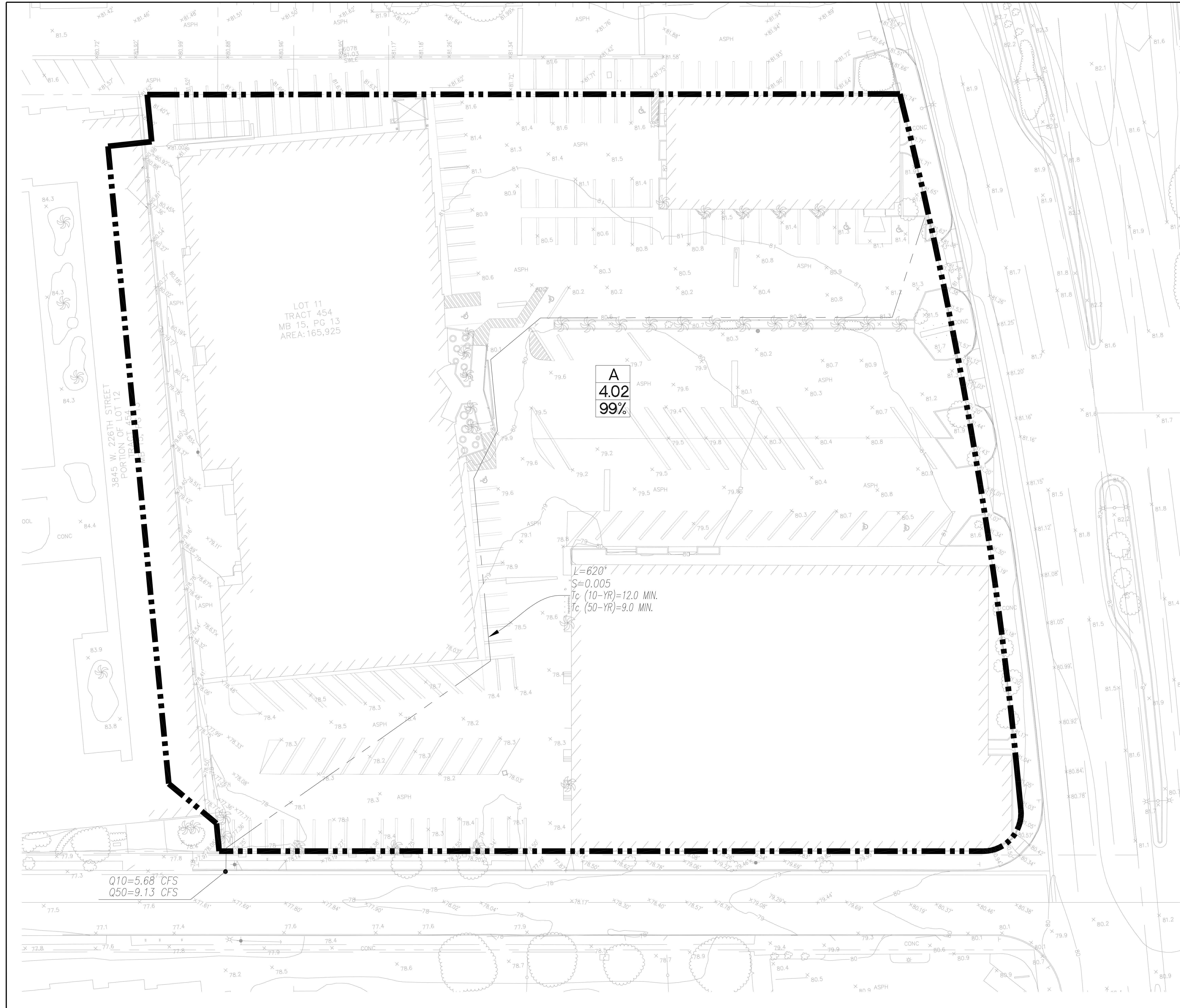
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
 10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

TORRANCE 50-YEAR 24-HOUR ISOHYET

1-H1.4



APPENDIX C – HYDROLOGY MAPS



LOT 11
TRACT 454
MB 15, PG 13
AREA: 165,925

A
4.02
99%

L=620'
S=0.005
Tc (10-YR)=12.0 MIN.
Tc (50-YR)=9.0 MIN.

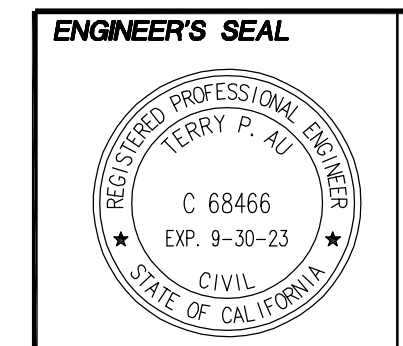
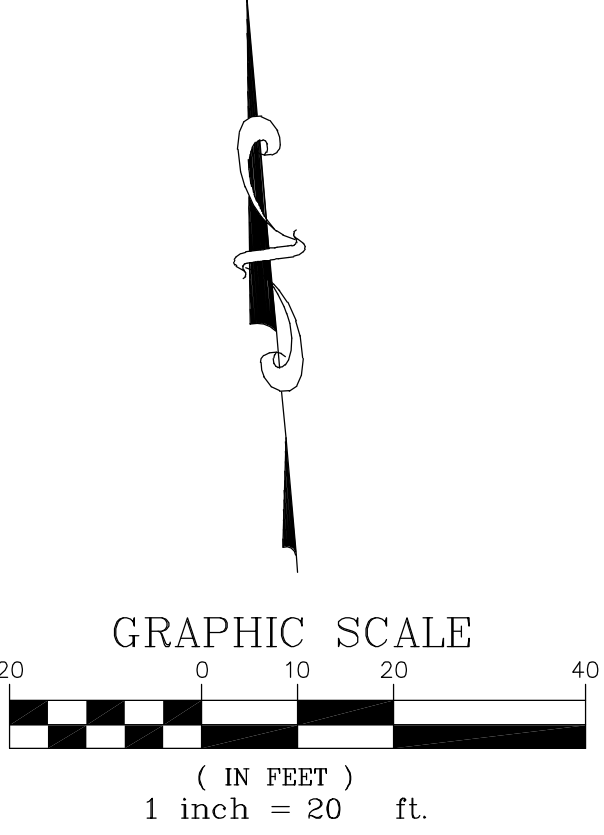
Q10=5.68 CFS
Q50=9.13 CFS

LEGEND

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY (OFFSITE)
- FLOWPATH AND DIRECTION OF FLOW
- SUB-AREA LABEL
- AREA (ACRES)
- % IMPERVIOUSNESS
- Q10 10 YEAR PEAK FLOW (CFS)
- Q50 50 YEAR PEAK FLOW (CFS)
- CFS CUBIC FEET PER SECOND
- L=888' LENGTH OF FLOWPATH (FT)
- S=0.01 SLOPE OF FLOWPATH (FT./FT.)
- Tc (10-YR) TIME OF CONCENTRATION (MIN.)
- SD PROPOSED PVC SD (FOR LOW FLOW INTO WATER QUALITY TREATMENT SYSTEM)

HYDROLOGY DATA:
SOIL TYPE NO. 010
ISOHYET (IN.), 10-YR: 4.00
50-YR: 5.60
DESIGN STORM FREQUENCIES 10-YR AND 50-YR

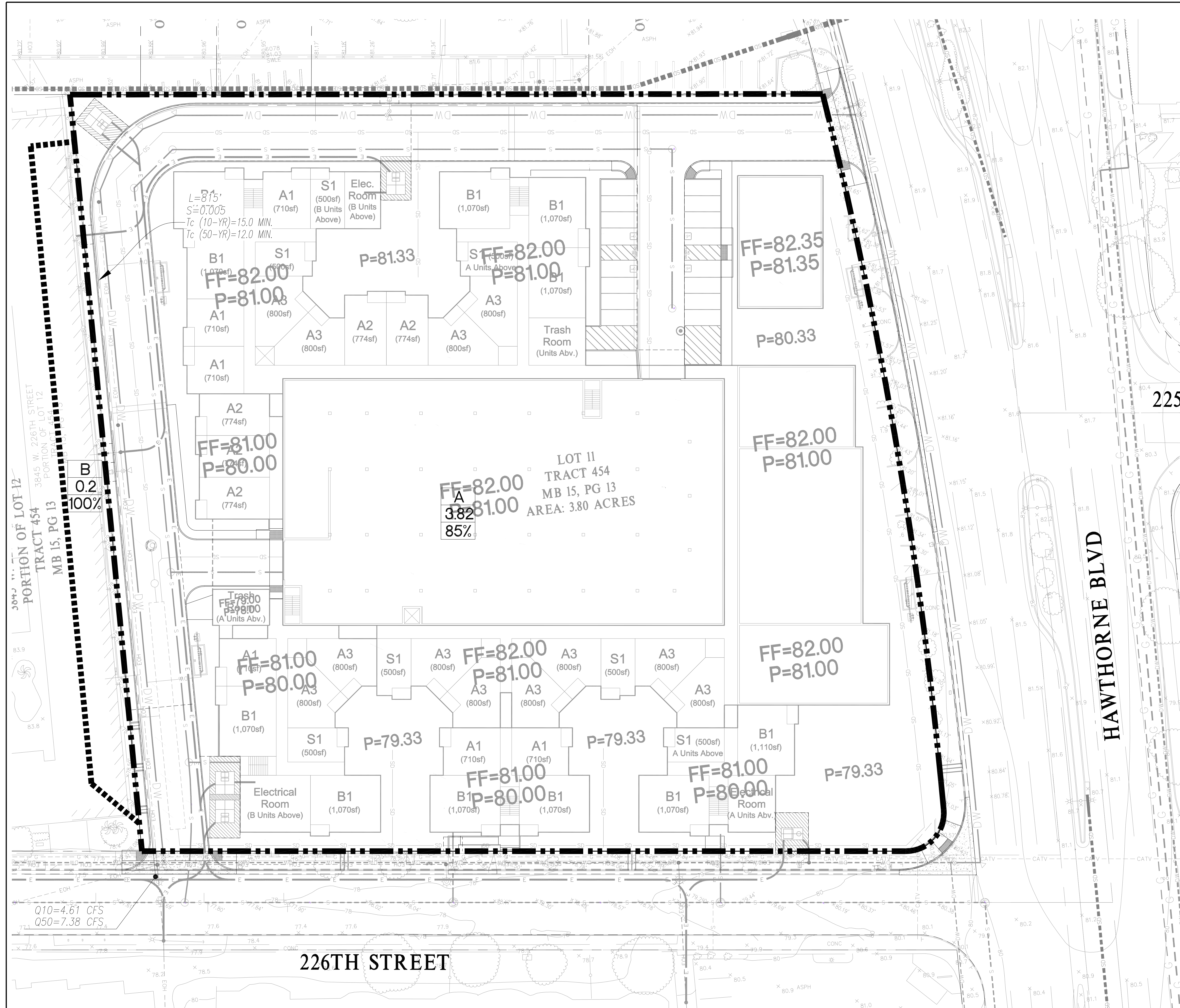
NOTES
1. SUBAREA A - STORM FLOWS GENERALLY SURFACE DRAINING SOUTHWESTERLY INTO STREET GUTTER IN HAWTHORNE BLVD AND/OR W. 226TH STREET. INCLUDES 0.2 ACRES OF OFFSITE RUN-ON FROM EXISTING APARTMENT SITE LOCATED TO THE WEST OF THIS SITE.



PREPARED BY:
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PHONE: 949-727-9095

EXISTING CONDITION
PRELIMINARY HYDROLOGY STUDY
TRACT 454 LOT 11
22501 HAWTHORNE BLVD, TORRANCE

PLAN SET: A
DATE: 12-9-21
P:\278123\HYDROLOGY\PRELIMINARY HYDROLOGY\278123-PREL-HYDROLOGY-LX.dwg
INTRACORP-HOMES



LEGEND

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY (OFFSITE)
- FLOWPATH AND DIRECTION OF FLOW
- SUB-AREA LABEL
- AREA (ACRES)
- % IMPERVIOUSNESS
- Q10 10 YEAR PEAK FLOW (CFS)
- Q50 50 YEAR PEAK FLOW (CFS)
- CFS CUBIC FEET PER SECOND
- L=888' LENGTH OF FLOWPATH (FT)
- S=0.01 SLOPE OF FLOWPATH (FT./FT.)
- Tc (10-YR) TIME OF CONCENTRATION (MIN.)
- SD PROPOSED PVC SD (FOR LOW FLOW INTO WATER QUALITY TREATMENT SYSTEM)

HYDROLOGY DATA:
 SOIL TYPE NO. 010
 ISOHYET (IN.), 10-YR: 4.00
 50-YR: 5.60
 DESIGN STORM FREQUENCIES 10-YR AND 50-YR

NOTES

- SUBAREA A - LARGE STORM FLOWS SURFACE DRAINING INTO STREET GUTTER IN HAWTHORNE BLVD AND/OR W. 226TH STREET. "FIRST FLUSH" FLOWS ARE CAPTURED BY ONSITE DRAINS AND CONVEY BY PVC DRAINLINES INTO ONSITE WATER QUALITY SYSTEM FOR TREATMENT/INFILTRATION.
- SUBAREA B - OFFSITE AREA CURRENTLY SURFACE DRAINING ONTO EXISTING SITE THAT IS MAINTAINED IN THE PROPOSED CONDITION. WALL OPENINGS WILL BE PROVIDED AT THE SOUTH END OF THE PROPOSED WESTERLY BOUNDARY WALL TO ALLOW FLOWS FROM THIS AREA TO SURFACE DRAIN ONSITE AND INTO W. 226TH STREET.

PORTION OF LOT 12
 TRACT 454
 MB 15, PG 13

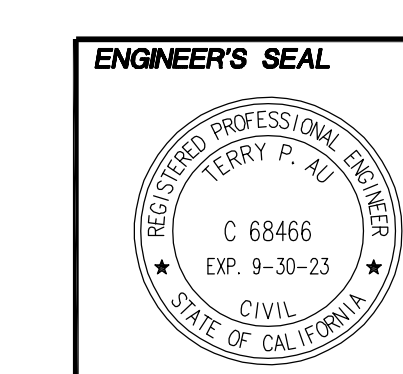
Q10=4.61 CFS
 Q50=7.38 CFS

226TH STREET

HAWTHORNE BLVD

225'

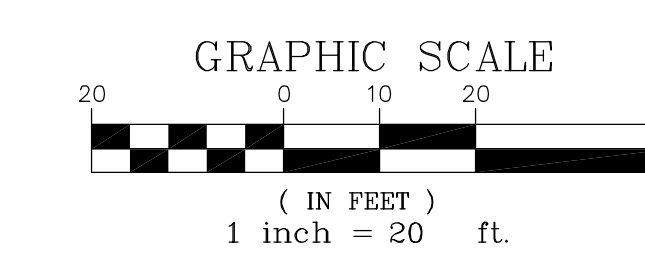
LOT 11
 TRACT 454
 MB 15, PG 13
 AREA: 3.80 ACRES



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 PHONE: 949-727-9095

PROPOSED CONDITION
PRELIMINARY HYDROLOGY STUDY
TRACT 454 LOT 11
22501 HAWTHORNE BLVD, TORRANCE



PLAN SET: A
 DATE: 12-9-21
 P:\2781237\HYDROLOGY\PRELIMINARY HYDROLOGY\21-PR-1\HYDROLOGY_LP.dwg
 PLOT DATE: Dec 16, 2021 6:08PM
 INTRACORP-HOMES