Appendix H

Hydrology Report

Kimley»Horn

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LID/HYDROLOGY/HYDRAULICS REPORT

FOR:
525 South Virgil Ave
Los Angeles, CA 90057

Prepared for:
Shatto EMET Q0ZB LP
2219 Main Street, Suite 260
Santa Monica, CA 90405

Project No: LAX25-0037-00



Prepared by: _____ 01/16/2026
Signature Date

Engineer: Keith Malloy
Registration No. 84456

Ware Malcomb
915 Wilshire Blvd, Suite 2150
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Prepare Date: January 16, 2026
Revised:

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Project No: LAX25-0037-00 ..... Error! Bookmark not defined.
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I. Project Description

i. Background

The purpose of this report is to provide an analysis of the existing and proposed conditions to support the grading and drainage design for the project and to understand if there may exist any adverse impacts to downstream facilities as a result of the proposed development.

The project is located at 525 Virgil Avenue, Los Angeles, CA 90020 and tributary to the Los Angeles River Basin plan. The proposed project area entails 0.97 acres of new construction of 8-floor, 252,876 sf total, self-storage building.

The Project Site is bounded by a 2 to 3-story medical building and a paved parking lot to the north, S. Virgil Avenue to the east, paved parking lots to the south, and S. Westmoreland Avenue to the west.

ii. Existing Drainage Condition

The existing site is 42,144 sf (97.9% impervious) currently developed with a 4-story office building and associated at-grade parking lot located to the west of the office building. The existing building and associated site improvements will be demolished prior to the proposed construction. There are no signs of concentrated flow paths or erosion on the lot. There are no signs of run-on from the adjacent properties. There does not currently any LID treatment devices on the property.

iii. Proposed Drainage Condition

The proposed site is 42,144 sf (97.9% impervious), calculated with the cumulative area of paving, curb, sidewalk and buildings, using the proposed site plan. For the proposed condition, the overall drainage pattern will remain unchanged. Stormwater will be captured on the roof and drain into underground detention system. Low flows will be pumped to rooftop biofiltration system and high flows will be pumped out the curb face. Low flows from the treatment system will eventually be routed out the curb face as well.

As part of the proposed project, there is a 3' dedication required along Virgil Ave. This area has been included in the hydrology calculations for the site, however it will surface flow directly into Virgil Ave.

See *Appendix B* for the Post-Development Hydrology Exhibit.

II. Objectives

The purpose of this report is to provide an analysis of the existing and proposed conditions to support the grading and drainage design for the project and to understand if there may exist any adverse impacts to downstream facilities as a result of the proposed development.

III. Procedures

The Bureau of Engineering Storm Drain Design Manual G 200 Hydrologic Design guidelines advises to design drainage facilities to mitigate the 10-year storm event. LA County's HydroCalc was used to calculate the 10-year runoff values, treatment volume, and treatment flow. The variables taken into consideration in the computation include the drainage area, soil type, extent of vegetal cover, shape of the watershed, rainfall intensity, and frequency of occurrence.

IV. Hydrology

i. Design Criteria and Methods

The LA County Hydrology Manual and HydroCalc software were used to calculate all required volumes and flow rates. A tabulation of the results can be found below:

Site Discharge

Storm Event	Existing Impervious Area (ac)	Existing Impervious (%)	Proposed Impervious Area (ac)	Proposed Impervious (%)	Existing (CFS)	Proposed (CFS)	Delta (CFS)	Delta (%)
Q10	0.95	97.9	0.95	97.9	2.41	2.41	0	0
Q25	0.95	97.9	0.95	97.9	2.96	2.96	0	0
Q50	0.95	97.9	0.95	97.9	3.38	3.38	0	0

ii. FEMA Floodplain Identification & Considerations

Per FEMA Flood Map, the site project is located within Zone X; area of minimal flood hazard. See *Appendix A* for the FEMA Flood Map.

V. Hydraulic Analysis

i. Storm Drain Pipe Sizing

Hydraulic capacities for on-site were not calculated due to drain lines not being proposed on the site, the drainage pattern will remain and sheet flow to the existing street inlets.

ii. Site Overflow

The storm drain system and site grading have been designed to protect the building finished floor during an extreme storm scenario or clogging. During such events, the stormwater will surface flow off the site through the driveways, runoff will exit the site through the drive aisle and will not rise to the building finished floor elevation.

VI. Low Impact Development

City of Los Angeles Planning and Land Development Handbook for Low Impact Development (5th edition) was used to design the LID system for the site. Per the manual, the project is required to treat the 85th percentile storm event for the entire site. Per the geotechnical report, infiltration is not feasible for this site. Since infiltration is not feasible, the next treatment method to use per the LID manual is Capture and Reuse, however, there is not sufficient landscape on site to utilize capture and reuse. The final method of treatment, biofiltration, will be used on site. A green roof tray system will be utilized to treat the required amount of stormwater.

Per the LA County Software, 3,087 cf of stormwater is required to be treated. However, biofiltration has a 1.5x penalty which increases the volume required to be treated to 4,631 cf. The green roof trays have been sized to treat this volume. See volume calculations below.

Area (ac)	Impervious %	Flow Path Length (LF)	Slope	85th	Required Treatment Volume (cu. ft)
0.97	97.9	367	0.020	1.0	4,631

See Appendix E for LID calculations, plans, and details.

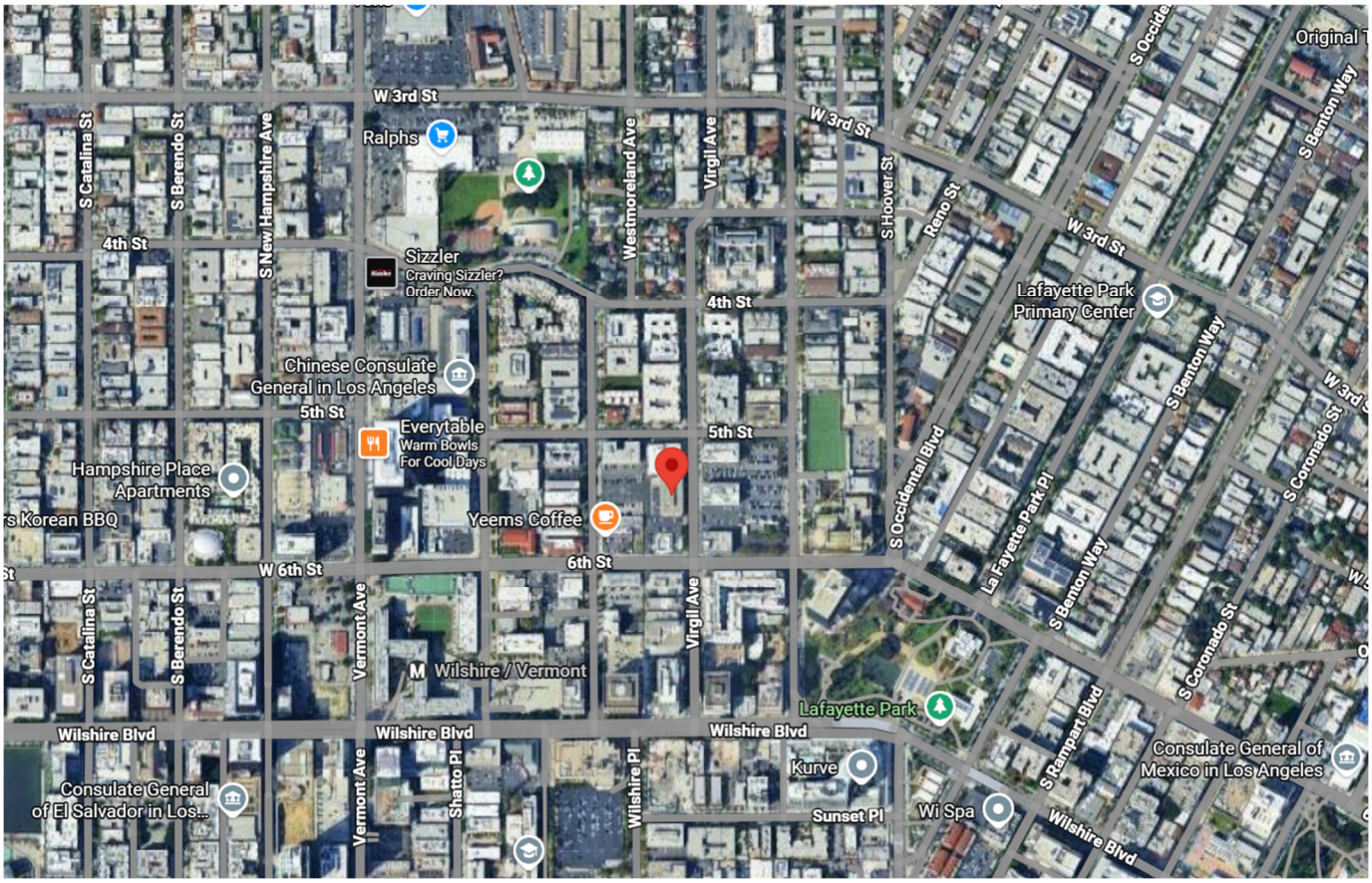
VII. Conclusion

Based on the hydrology study, the proposed development will maintain the amount of runoff in comparison to the existing condition. Therefore, the proposed development will not have any adverse impact on the downstream facilities. Based on geotechnical report and amount of landscaping on site, biofiltration is the only feasible method to treat stormwater.

The project has been designed to comply with all requirements of the County of Los Angeles Department of Public Works Low Impact Development Standards Manual and Hydrology Manual.

Appendix A – Site Maps

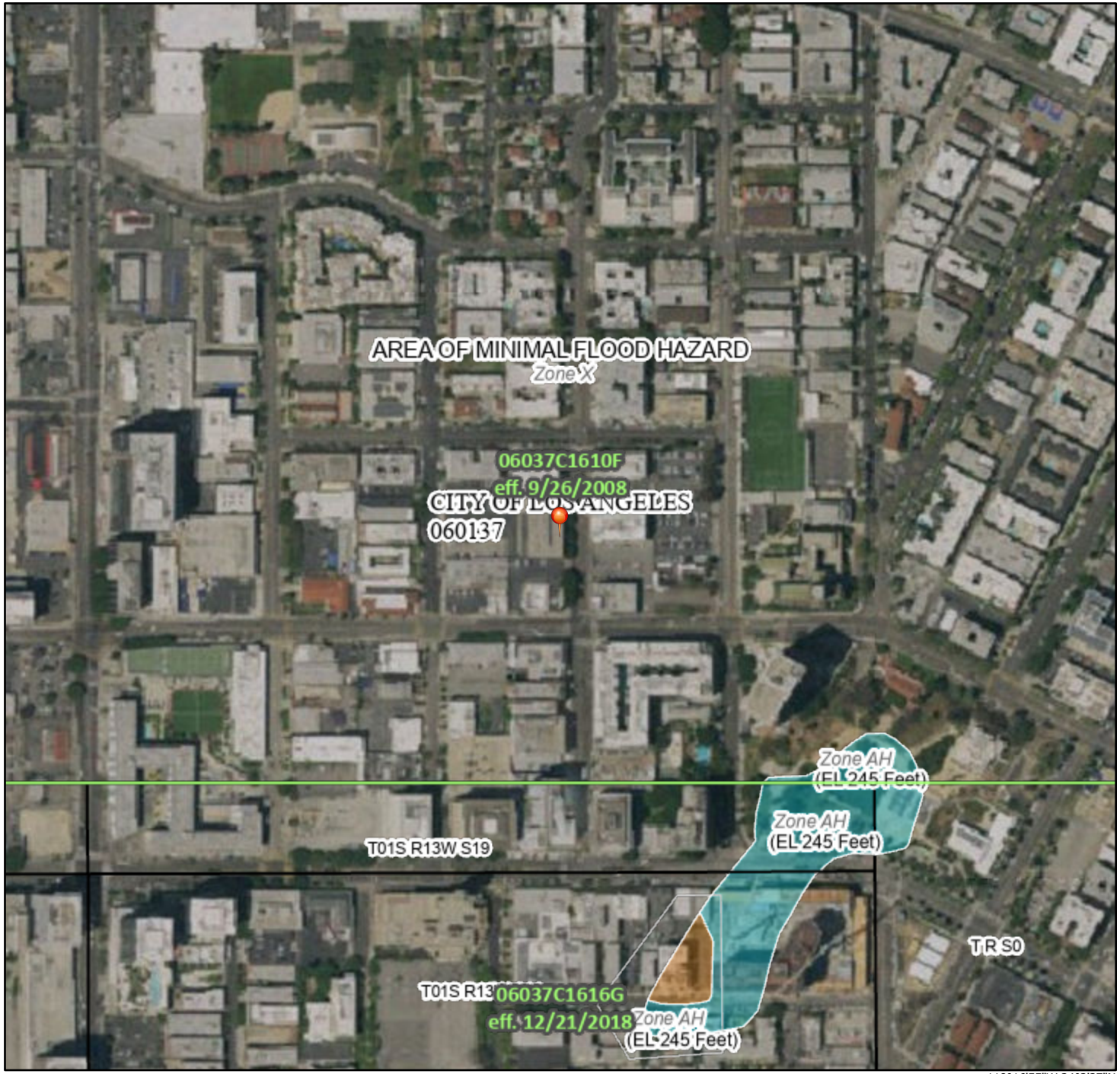
Vicinity Map



National Flood Hazard Layer FIRMette

FEMA

118°17'33"W 34°4'7"N



118°16'55"W 34°3'37"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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*
- Area with Flood Risk due to Levee *Zone D*

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

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

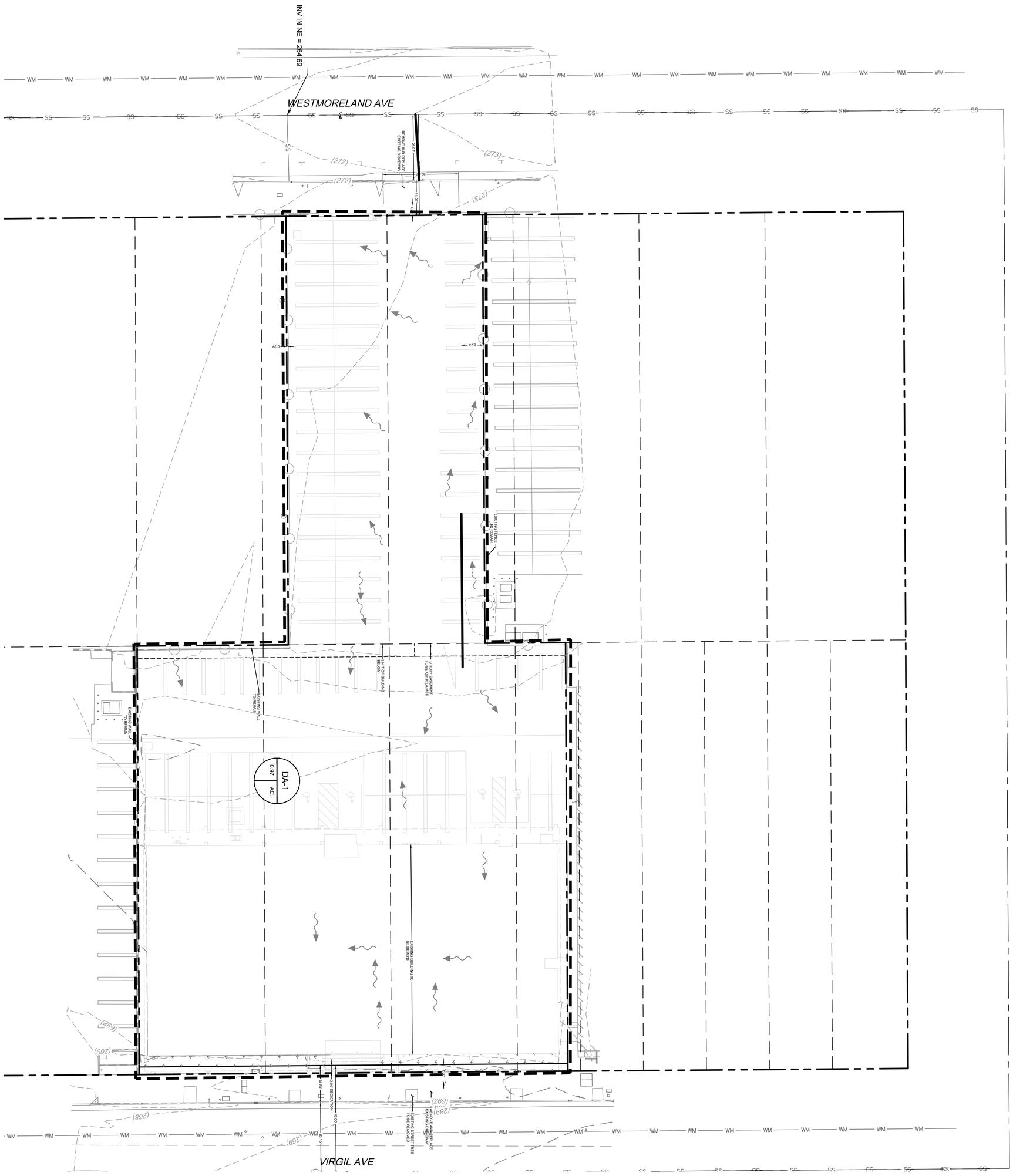
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/19/2025 at 8:32 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix B – Hydrology Exhibits



SITE AREA (AC)	0.97
DISTURBED AREA (AC)	0.97
IMPERVIOUS AREA (AC)	0.95 (97.9%)
PERVIOUS AREA (AC)	0.02 (2.1%)
EXISTING CONDITION Q	2.96
PROPOSED CONDITION Q	2.96

25-YEAR HYDROLOGY SUMMARY

DRAINAGE AREA	AREA (AC)	SLOPE	IMPERVIOUS FRACTION	TC (MIN)	Q_{25} (CFS)	VOLUME (CF)
DA-1	0.97	0.009	97.9	5.0	2.96	17,579

LEGEND:

- PROPERTY LINE/RIGHT OF WAY
- CENTERLINE
- EASEMENT
- DRAINAGE BOUNDARY
- FLOW PATH
- PERVIOUS AREA
- MANHOLE
- CATCH BASIN INLET
- STORM DRAIN
- A=BASIN DESIGNATION B=BASIN AREA

SCALE: 1" = 20'

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SHEET 1 Sheet 1 of 1

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JOB NO.:	LAX25-0037-00
PA / PM:	K.MALLOY
DESIGNED:	
DATE:	01/16/26
PLOT DATE:	01/16/26

EXISTING HYDROLOGY PLAN

NO.	DATE	REMARKS
	09/03/2025	1ST PLANNING SUBMITTAL

525 VIRGIL AVENUE
LOS ANGELES, CA 90020

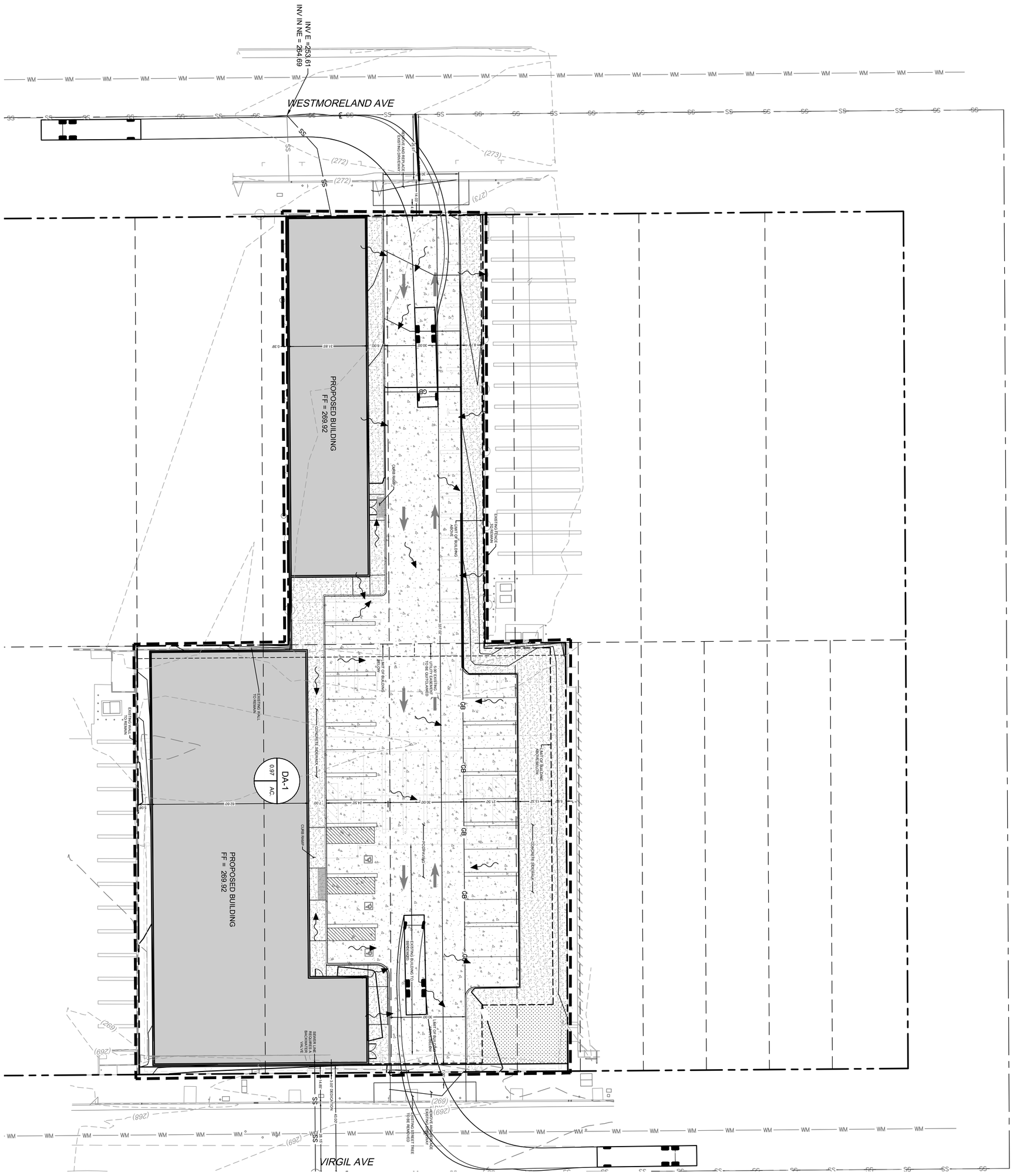
REGISTERED PROFESSIONAL ENGINEER
KEITH D. MALLOY
No. C84456
CIVIL
STATE OF CALIFORNIA
01/16/2026

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LEGEND:

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JOB NO.: LAX25-0037-00
PA / PM: K.MALLOY
DESIGNED:
DATE: 01/16/26
PLOT DATE: 01/16/26

PROPOSED HYDROLOGY PLAN

NO.	DATE	REMARKS
	09/03/2025	1ST PLANNING SUBMITTAL

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525 VIRGIL AVENUE
LOS ANGELES, CA 90020

OF WARE MALCOMB

REGISTERED PROFESSIONAL ENGINEER KEITH D. MALLOY No. C84456 CIVIL STATE OF CALIFORNIA
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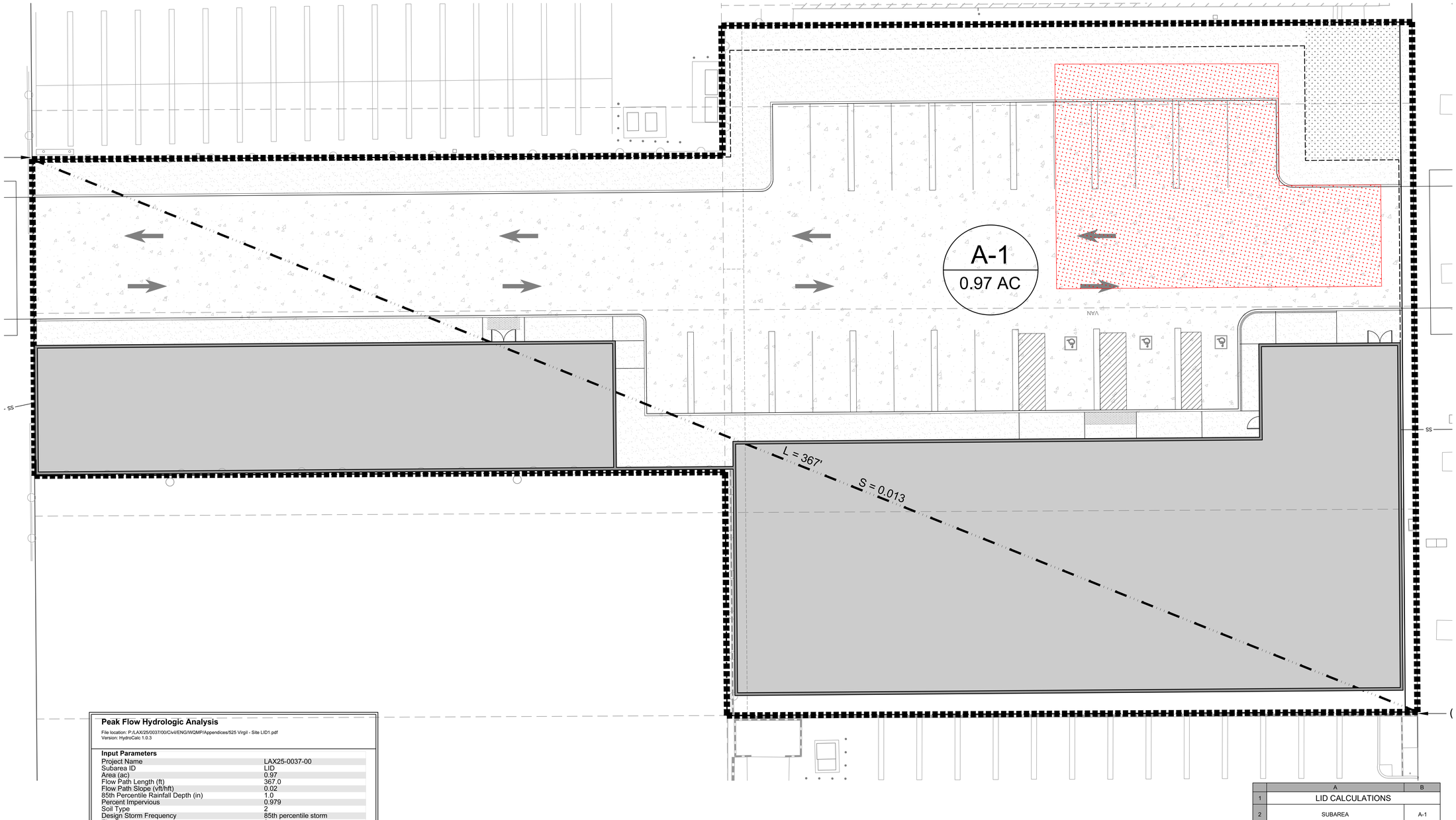
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Appendix C – HydroCalc Pre-Development Condition

Appendix D – HydroCalc Post-Development Condition

Appendix E – LID Plan & BMP Details



Peak Flow Hydrologic Analysis

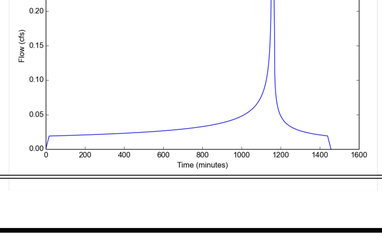
File location: P:/LAX/25/0037/00/Civil/ENG/WQMP/Appendices/525 Virgil - Site LID1.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	LAX25-0037-00
Subarea ID	LID
Area (ac)	0.97
Flow Path Length (ft)	367.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.979
Soil Type	2
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.3357
Undeveloped Runoff Coefficient (Cu)	0.4641
Developed Runoff Coefficient (Cd)	0.8908
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	0.2901
Burned Peak Flow Rate (cfs)	0.2901
24-Hr Clear Runoff Volume (ac-ft)	0.0709
24-Hr Clear Runoff Volume (cu-ft)	3086.7917



	A	B
1	LID CALCULATIONS	
2	SUBAREA	A-1
3	SITE AREA (AC)	0.97 AC
4	SITE AREA (SF)	42,144 SF
5	PERVIOUS AREA	797 SF
6	IMPERVIOUS AREA	41,347 SF
7	IMPERVIOUS %	97.9 %
8	FLOW PATH LENGTH	367 LF
9	SLOPE	0.020
10	SOIL TYPE	2
11	85% RAINFALL DEPTH	1.00 IN
12	REQUIRED TREATMENT VOLUME (SWQDv)	3,087CF
13	REQUIRED TREATMENT VOLUME (SWQDv X 1.5)	4,631 CF
14	REQUIRED BIOFILTRATION AREA	2,900 SF

N

0 10 20
SCALE: 1" = 10'

LEGEND

- RIGHT OF WAY/ PROPERTY LINE
- LID AREA BOUNDARY
- GREEN ROOF TRAY (LID FEATURE)
- FLOW PATH
- SD — STORM DRAIN
- CATCH BASIN

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CONCEPT LID PLAN

NO	DATE	REMARKS
	09/03/2025	1ST PLANNING SUBMITTAL

JOB NO.:	LAX25-0037-00
PA / PM:	K.MALLOY
DESIGNED:	
DATE:	10/23/2025
PLOT DATE:	01/16/26

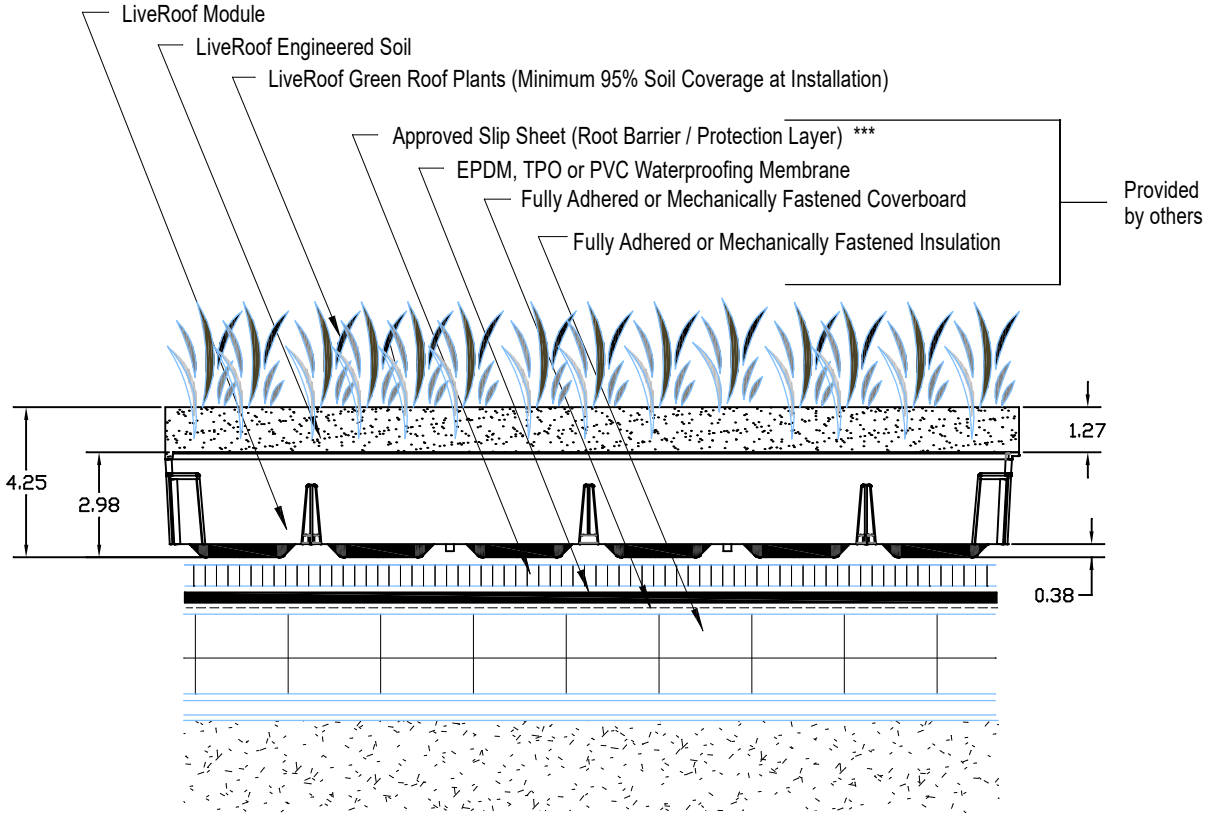
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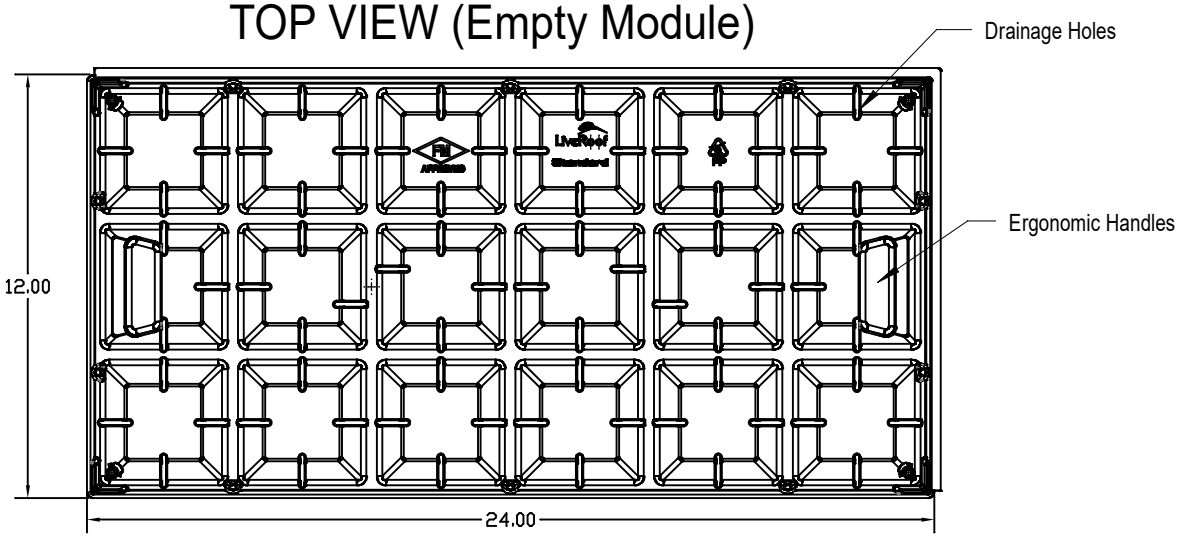
LiveRoof STANDARD SYSTEM

Over Conventional Roofing Assembly

SIDE VIEW



TOP VIEW (Empty Module)



*** Examples of commonly used slip sheet (Root Barrier / Protection Layer) include minimum 40mil EPDM, TPO, PVC polypropylene, Polyolefin or other product depending type of roof and/or warranty. Installer to confirm compatibility of slip sheet (Root Barrier / Protection Layer) and waterproofing membrane with waterproofing membrane manufacturer.

LiveRoof System Saturated Weight: 27-29 lbs / sf

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STD Conventional
2022-12-17

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P.O. Box 533
Spring Lake, MI 49456

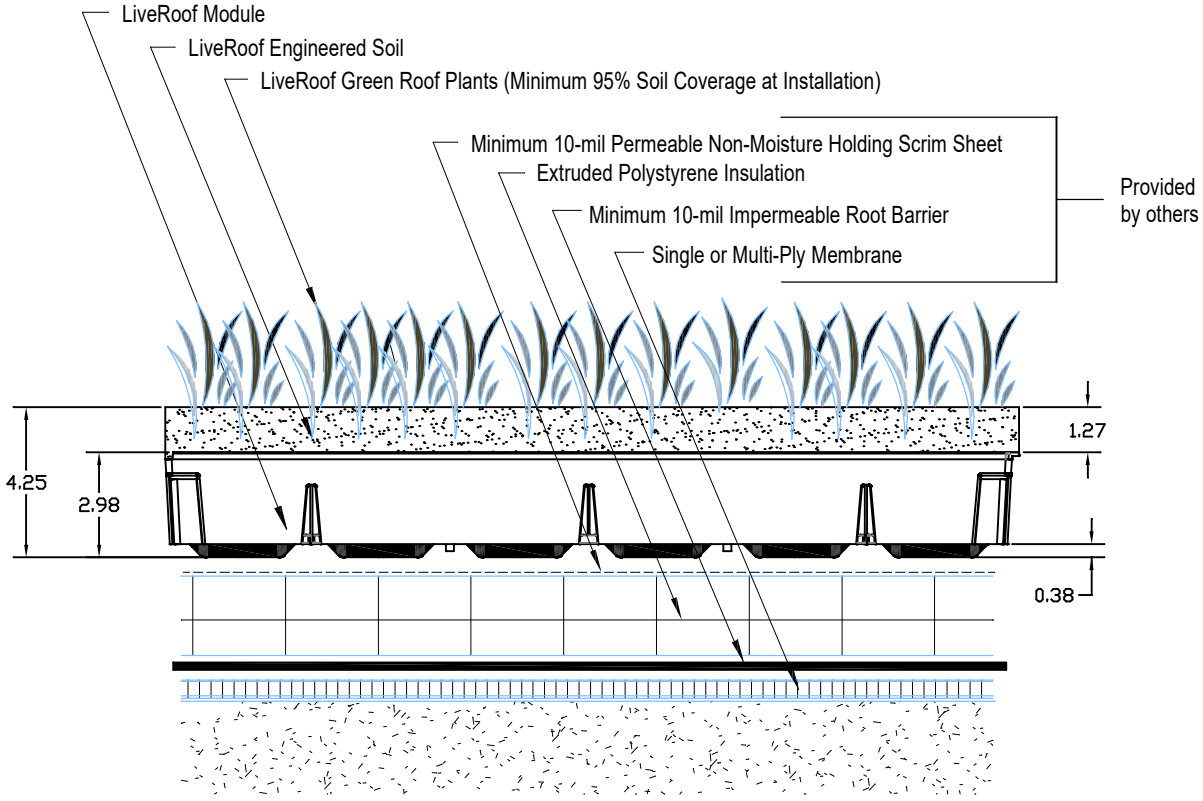
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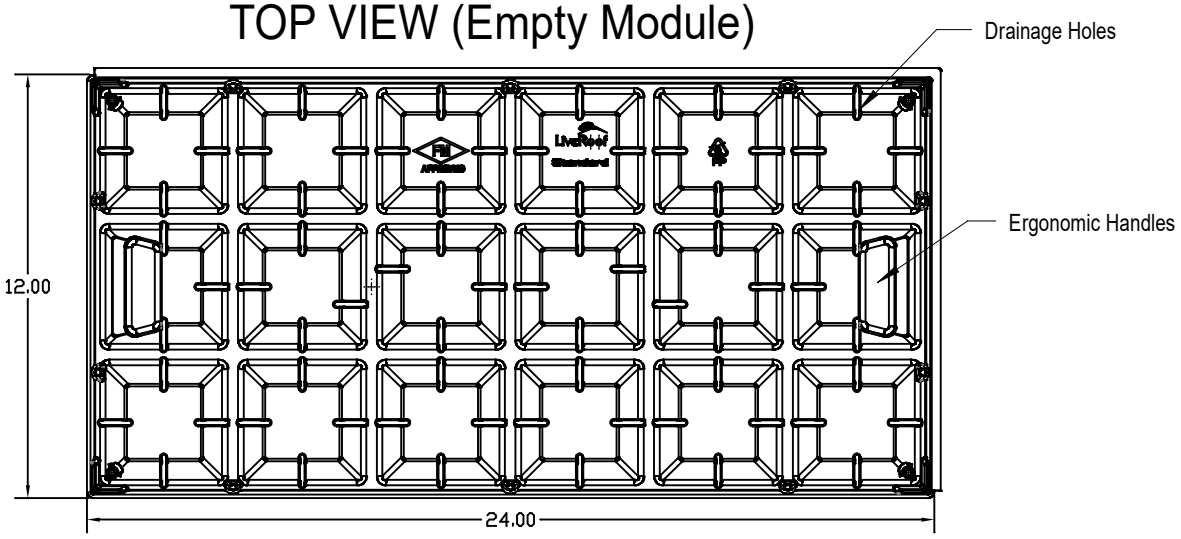
LiveRoof STANDARD SYSTEM

Over Protective Membrane Assembly

SIDE VIEW



TOP VIEW (Empty Module)



LiveRoof System Saturated Weight: 27-29 lbs / sf

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STD Membrane
2022-11-8

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