PRELIMINARY
Low Impact Development Plan
(LID Plan)

Project Name:

PROSPECT VILLA MIXED-USE

7539 GRAVEY AVE,

ROSEMEAD, CA 91770

Prepared for:

DEL MAR PROPERTY, LLC

CONTACT: ROLAND LO

120 E. VALLEY BLVD

SAN GABRIEL, CA 91176

(626)307-0062

Prepared by:

TRITECH ENGINEERING ASSOCIATES, INC

135 N SAN GABRIEL BLVD,

SAN GABRIEL, CA 91775

(626)570-1918

January 06, 2022

Project Owner's Certification

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathered the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner's Name:	DEL MAR PROPERTY, LLC		
Owner's Title:			
Company:	DEL MAR PROPERTY, LLC		
Address:	120 E VALLEY BLVD, SAN GABRIEL, CA 91776		
Email:	roland@scaleslab.com		
Telephone No:	626-307-0062		
Signature:		Date:	

Preparer (Engineer) Certification

Engineer's Name:	GUAN WANG
Engineer's Title:	PRINCIPAL ENGINEER
Company:	TRITECH ENGINEERING ASSOCIATES, INC
Address:	135 N SAN GABRIEL BLVD, SAN GABRIEL, CA 91775
Email:	INFO@TRITECHENGINEER.COM
Telephone No:	626-570-1918

I hereby certify that this Low Impact Development Plan is in compliance with, and meets the requirements set forth in, Order WQ 2015-0075, of the Los Angeles Regional Water Quality Control Board.

Engineer's Signature		Date	01/06/2022
Place Stamp Here			

Table of Contents

Attachments

1. PROJECT DESCRIPTION

1.1. PROJECT CATEGORY

Category	YES	NO
1. Development [a] of a new project equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious area [b]	☐	☐
2. Development [a] of a new industrial park with 10,000 square feet or more of surface area [c]	☐	☐
3. Development [a] of a new commercial mall with 10,000 square feet or more surface area [c]	☒	☐
4. Development [a] of a new retail gasoline outlet with 5,000 square feet or more of surface area [c]	☐	☐
5. Development [a] of a new restaurant (SIC 5812) with 5,000 square feet or more of surface area [c]	☐	☐
6. Development [a] of a new parking lot with either 5,000 ft^2 or more of impervious area [b] or with 25 or more parking spaces	☐	☐
7. Development [a] of a new automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area [c]	☐	☐
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA),[d] where the development will: a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and b. Create 2,500 square feet or more of impervious area [b]	☐	☐
9. Redevelopment [e] of 5,000 square feet or more in one of the categories listed above **If yes, list redevelopment category here:**	☐	☐
10. Redevelopment [e] of 10,000 square feet or more to a Single Family Home, without a change in landuse.	☐	☐

a Development includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in land disturbance.

b Surfaces that do not allow stormwater runoff to percolate into the ground. Typical impervious surfaces include: concrete, asphalt, roofing materials, etc.

c The surface area is the total footprint of an area. Not to include the cumulative area above or below the ground surface.

d An area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and would be disturbed or degraded by human activities and developments. Also, an area designated by the City as approved by the Regional Water Quality Control Board.

e Land-disturbing activities that result in the creation, addition, or replacement of a certain amount of impervious surface area on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of facility, nor does it include modifications to existing single family structures, or emergency construction activities required to immediately protect public health and safety.

1.2. PROJECT DESCRIPTION

Total Project Area (ft^2): 41,339

Total Project Area (Ac): 8.497

EXISTING CONDITIONS

Condition	Area (ft^2)	Percentage (%)
Pervious Area:	41,339	100
Impervious Area:	0	0

PROPOSED CONDITIONS

Condition	Area (ft^2)	Percentage (%)
Pervious Area:	147	0.4
Impervious Area:	41,192	99.6

SITE CHARACTERISTICS

DRAINAGE PATTERNS/CONNECTIONS	Existing: The existing project is vacant land. The drainage flows from south to north and drains into north adjacent property by gravity. The runoff from north adjacent property flows west and drains into Prospect Ave by gravity and be collected by the Public Stormdrain System (Open curb catch basin) at the front of property.
	Proposed: This project is a Mixed-Use project. More than 99% of lot area will be covered by the proposed building. The landscape area is approximately 147 SF. The Impervious surface is 99.6% of the lot area. (use 100%impervious surface for hydrology analysis) After development, the runoff will be collected by roof system, trench drain, area drains, and catch basins. All stormwater will be captured by 60”-dia storage pipe. The overflow from the storage pipe will directly drain to Prospect Ave via parkway drain. The stormwater in the 60”-dia storage pipe will be pumped to the Bio-filtration system for LID Purposes. The outflow and overflow from Bio-filtration system will be pumped to Prospect Ave via curb drain. The runoff from the project site will be captured by the Public Stormdrain System (Open-curb catch basin) at the northeast corner between Prospect Ave and Garvey Ave (front of project site).

NARRATIVE PROJECT DESCRIPTION:	This project is located at the northeast corner between Prospect Ave and Garvey Ave in the city of Rosemead, County of Los Angeles, State of California. The net area of project site is 41,339 SF excluding dedication area. All area will be disturbed. This project has only one drainage area (DA). All runoff will be collected by roof system, area drain, catch basin and trench drain. All stormwater discharges to the proposed 60"-dia storage pipe located under driveway. The water in storage pipe is pumped to Bio-filtration System for LID and Hydromodification purposes. The volume of storage pipe is designed to capture the 2-year frequency runoff volume for reduce the peak flow rate lower than existing condition before discharge to the Public. The pump system has to design the flow rate lower than the treatment rate. Then the outflow from the Bio-filtration system will lower than the 2-year Pre-developed runoff. The overflow from storage pipe (in the case of storm more than 2-year frequency) directly drains into Prospect Ave by gravity via parkway drain. Per hydrology analysis (see attachment A for details), the 2-year frequency runoff have to detain onsite. The post-developed peak flow rate for 10-year, 25-year, 50-year, and 100-year will not more than the pre-developed peak flow rate. Therefore the runoff from the project site will not adversely impact to the downstream properties.
OFFSITE RUNOFF	There is no offsite runoff to project site.
PUBLIC UTILITY AND INFRASTRUCTURE INFORMATION	There is no public utility or public infrastructures onsite.
SIGNIFICANT ECOLOGICAL AREAS (SEAS)	This project site is not located in Significant Ecological Area. The runoff from the project site does not drain into the Significant Ecological Area.

Identification of receiving waters

The runoff from the project site will be collected by the open-curb catch basin located at front of the project site at the northeast corner between Garvey Ave and Prospect Ave that connecting to the public stormdrain pipe. The runoff inside the public stormdrain pipe flows north and turns east to Alhambra Wash. The stormwater in Alhambra Wash flows south and drain into Rio Hondo Channel. The runoff in Rio Hondo Channel flows south and discharges to Los Angeles River and flows south to Pacific Ocean at end.

Identification of Known Pollutants

303(d) listed impairment:

Rio Hondo Channel Reach 2:	Coliform Bacteria and Cyanide
Rio Hondo Channel Reach 1:	Coliform Bacteria, Copper, Lead, Ph, Toxicity, Trash, and Zinc
Los Angeles River Reach 2:	Ammonia, Coliform Bacteria, Copper, Lead, Nutrients (Algae), Oil, Trash
Los Angeles River Reach 1:	Ammonia, Cadmium, Coliform Bacteria, Copper, Cyanide, Diazinon, Lead, Nutrients (Algae), pH, Trash, and Zinc
Los Angeles River Estuary:	Chlordane, Sediment Toxicity, DDT, PCBs, and Trash
Long Beach City Beach:	Indicator Bacteria
Los Angeles/Long Beach Outer Harbor:	DDT, PCBs, Sediment Toxicity

Total Maximum Daily Loads (TMDL):

Rio Hondo Channel Reach 2:

Coliform Bacteria	Expected TMDL Completion Date 2009
Cyanide	Expected TMDL Completion Date 2021

Rio Hondo Channel Reach 1:

Coliform Bacteria	Expected TMDL Completion Date 2019
Copper	Date TMDL Approved by 12/22/2005
Lead	Date TMDL Approved by 12/22/2005
pH	Date TMDL Approved by 03/18/2004
Toxicity	Expected TMDL Completion Date 2021
Trash	Date TMDL Approved by 07/24/2008
Zinc	Date TMDL Approved by 12/22/2005

Los Angeles River Reach 2:

Ammonia	Date TMDL Approved by 03/18/2004
Coliform Bacteria	Expected TMDL Completion Date 2009
Copper	Date TMDL Approved by 12/22/2005
Lead	Date TMDL Approved by 12/22/2005
Nutrients (Algae)	Date TMDL Approved by 03/18/2004
Oil	Expected TMDL Completion Date 2019
Trash	Date TMDL Approved by 07/24/2008

Los Angeles River Reach 1:

Ammonia	Date TMDL Approved by 03/18/2004
Cadmium	Date TMDL Approved by 12/22/2005
Coliform Bacteria	Expected TMDL Completion Date 2009
Copper, Dissolved	Date TMDL Approved by 12/22/2005
Cyanide	Expected TMDL Completion Date 2019
Diazinon	Expected TMDL Completion Date 2019
Lead	Date TMDL Approved by 12/22/2005
Nutrients (Algae)	Date TMDL Approved by 03/18/2004
pH	Date TMDL Approved by 01/01/2003
Trash	Date TMDL Approved by 07/24/2008
Zinc	Date TMDL Approved by 12/22/2005

Los Angeles River Estuary:

Chlordane (Sediment)	Expected TMDL Completion Date 2019
DDT (Sediment)	Expected TMDL Completion Date 2019
PCBs (Sediment)	Expected TMDL Completion Date 2019
(Polychlorinated biphenyls)	
Sediment Toxicity	Expected TMDL Completion Date 2019
Trash	Date TMDL Approved by 07/24/2008

Long Beach City Beach:

Indicator Bacteria	Expected TMDL Completion Date 2019

Los Angeles/Long Beach Outer Harbor:

DDT	Expected TMDL Completion Date 2019
PCBs (Sediment)	Expected TMDL Completion Date 2019
Sediment Toxicity	Expected TMDL Completion Date 2008

The following table summarizes the applicable TMDL and 303(d) dry and wet weather impairments for each downstream conveyance.

Body of Water	Pollutants	
	Wet weather	**Dry weather**
Alhambra Wash	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL)
Rio Hondo Reach 3	Trash (TMDL),Nitrate (TMDL),Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL), Iron (303d), Dissolved Oxygen (303d)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL) Dissolved Oxygen (303d)
Rio Hondo Reach 2	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL) Coliform Bacteria (303d), Cyanide (303d)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL) Cyanide (303d)
Rio Hondo Reach 1	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL), Toxicity (303d)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL) Toxicity (303d)
Los Angeles Reach 2	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL), Oil (303d), Trash (303d)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL)
Los Angeles Reach 1	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL), Cyanide (303d)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL) Cyanide (303d)
Los Angeles/Long Beach Outer Harbor	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Cadmium (TMDL), Copper (TMDL), Lead (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL), DDT (TMDL), PCB (TMDL), Toxicity (TMDL), Sediment toxicity (303d)	Trash (TMDL), Nitrate (TMDL), Nitrite (TMDL), Ammonia (TMDL), Zinc (TMDL), Indicator Bacteria (TMDL) Sediment Toxicity (303d)

Pollutants of Concern

From geotracker.waterboards.ca.gov, there is no LUST cleanup site in 1000-ft radius from project site. Therefore this project site has no risks due to know pollutant contamination.

Per Los Angeles County LID Manual, the **p**otential pollutants in the runoff from the project site might include Suspended Solids, Total Phosphorus, Total Nitrogen, Total Kjeldahl Nitrogen, Copper, Lead, and Zinc

This project will use the filter insert catch basins, filter insert trench drain, downspout filter, and Biofiltration System with storage to treat the stormwater before drain into the public street. Therefore, the stormwater from this project will not cause any significant impact to any downstream receiving waters.

1.3. HYDROMODIFICATION ANALYSIS

DOES THE PROPOSED PROJECT FALL INTO ONE OF THE FOLLOWING CATEGORIES? CHECK YES/NO.	YES	NO
1. *Project is a redevelopment that decreases the effective impervious area compared to the pre-project conditions.*	☐	☒
Describe: There is no impervious surface in the pre-development conditions. After development will increase impervious surface more than pre-development conditions.		
2. *Project is a redevelopment that increases the infiltration capacity of pervious areas compared to the pre-project conditions.*	☐	☒
Describe: There is no impervious surface in the pre-development conditions. After development will increase impervious surface more than pre-development conditions.		
3. *Project discharges directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q_{100}) of 25,000 cfs or more.*	☐	☒
Describe: The runoff from project site drains into southwest adjacent property same existing condition.		
4. *Project discharges directly or via a storm drain into concrete or otherwise engineered (not natural) channels (e.g., channelized or armored with rip rap, shotcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts.*	☒	☐
Describe: The runoff from project site drains into the Public Stormdrain system located on northeast corner between Prospect Ave and Garvey Ave.		

HYDROMODIFICATION ANALYSIS

Per Attachment A, although the post-developed 2-year frequency peak flow rate is more than the existing condition, the storage pipes are designed to collect the volume of the post-developed 2-year stormwater. All stormwater volumes for 2-year frequency storm are detained and treated by Biofiltration System before drain into Prospect Ave. Therefore the peak flow rate for 2-year frequency after development will be less than the existing conditions.

From the Hydrology Analysis, the post-developed peak flow rates are not more than the pre-developed conditions for 10-year, 25-year, 50-year, and 100-year frequency. Therefore this development will not adversely impact drainage elements to the downstream properties.

1.4. PROPERTY OWNERSHIP/MANAGEMENT

Owner: DEL MAR PROPERTY, LLC.

Contact: ROLAND LO

Address: 120 E. VALLEY BLVD, SAN GABRIEL, CA 91176

Tel: (626)307-0062

The owner, DEL MAR PROPERTY, LLC, shall be responsible to all including funding of BMPs and long term operation and maintenance (O&M), Which is required for all source control, site design, and treatment control BMPs within the LID report/plan until such time that property is turned over to the new owner.

2. BEST MANAGEMENT PRACTICES (BMPS)

2.1. SITE DESIGN

85TH PERCENTILE, 24-HOUR STORM DEPTH	0.9”
SITE DESIGN	Per attached Soils Engineer’s letter, the infiltration system is not feasible for the project site. The Biofiltration with storage will be used for LID and Hydromodification for this project site.

BMP LIST

DMA DESIGNATION	SQUARE FOOTAGE (SF)	ACREAGE (AC)	STORM WATER QUALITY DESIGN VOLUME (SWQDV, CF)	BMP TYPE	MINIMUM BMP SIZE	BMP SIZE PROVIDED	GPS COORDINATES
Post	41,339	0.95	4,155.30 CF.	Biofiltration System with Storage	4,155.30 CF.	7,402.38 CF.	34.063294, -118.104651

2.2. BMP SELECTION

2.2.1. INFILTRATION BMPS

NAME	INCLUDED [Check all that apply.]
Bioretention without underdrains	☐
Infiltration Trench	☐
Infiltration Basin	☐
Drywell	☐
Proprietary Subsurface Infiltration Gallery	☐
Permeable Pavement (concrete, asphalt, pavers)	☐
Other:	☐
Other:	☐

DESCRIPTION	Per attached Soil Report (Attachment B), the infiltration system is not feasible for the project site.
CALCULATIONS	N/A

2.2.2. RAINWATER HARVEST AND USE BMPS

NAME	INCLUDED [Check all that apply.]
Above-ground cisterns and basins	☐
Underground detention	☐
Other:	☐
Other:	☐
Other:	☐

DESCRIPTION	This project needs large volume to detain stormwater to meet Hydromodification requirements. Because of the lacking of landscape area, the capture and reuse system is not feasible for this project site.
CALCULATIONS	N/A

2.2.3. ALTERNATIVE COMPLIANCE BMPS

BIOFILTRATION BMPS

(If Infiltration BMPs and Rainwater Harvest and Use BMPs are Infeasible)

NAME	INCLUDED [Check all that apply.]
Biofiltration system(i.e. planter box, rain garden, etc.)	☒
Constructed Wetland	☐
Vegetated Swale	☐
Vegetated Filter Strip	☐
Tree-Well Filter	☐
Other:	☐
Other:	☐

DESCRIPTION	The Biofiltration System with Storage will be used for Low Impact Development and Hydromodification Purposes for this project site. The location of The Biofiltration System with storage pipe is at the north of proposed building.
CALCULATIONS	Since this project needs to detain the stormwater for 2-year frequency storm, the volume of 2-year frequency runoff will be used to design the storage pipe. From the 85th percentile runoff analysis, The Storm Water Quality Design Volume (SWQDv) = 2,770.20 CF The Design Volume at 150%SWQDv = 4,155.3 CF The 2-year runoff volume (post-developed) = 7,385.36 CF The Provided BMP Volume (60”-DIA with 377-ft length) = 7,402.38 CF See Attachment A for calculations and details

OFFSITE BMPS

(If Infiltration BMPs, Rainwater Harvest and Use BMPs, and Biofiltration BMPs are Infeasible)

NAME	INCLUDED [Check all that apply.]
Offsite Infiltration	☐
Ground Water Replenishment Projects	☐
Offsite Project - Retrofit Existing Development	☐
Regional Storm Water Mitigation Program	☐
Other:	☐
Other:	☐

DESCRIPTION	No offsite BMPs for this project site.
CALCULATIONS [Show calculations to demonstrate how the conditions required by the MS4 Permit will be met with Alternative Compliance BMPs.]	N/A

2.2.4. TREATMENT CONTROL BMPS

NAME	INCLUDED [Check all that apply.]
Media Filter	☐
Filter Insert	☒
CDS Unit	☐
Other:	☐
Other:	☐

DESCRIPTION	Filter insert trench drain, grate inlet skimmer box, and downspout filter will be installed for Pre-Treatment. The calculation for filter BMPs will be provided in Final Report

2.2.5. HYDROMODIFICATION CONTROL BMPS

NAME	INCLUDED [Check all that apply.]
Infiltration System	☐
Above-ground Cistern	☐
Above-ground Basin	☐
Underground Detention	☒
Other:	☐
Other:	☐

DESCRIPTION	Since runoff from the project site drains into Public Stormdrain System (Open-curb Catch Basin) located at front of project site, the project site will be exempted from Hydromodification Requirements per Los Angeles County LID Manual. Although the project site is exempted from Hydromodification, the peak flow rate from the project site after development needs to be equal or less than the existing condition due to the capacity of the public stormdrain system. The Biofiltration System with Storage will be used to reduce the peak flow rate and to treat the stormwater for this project site before discharge to public.
CALCULATIONS	See Attachment A for calculations and details from the Hydrology analysis, Peak Flow Rate (CFS) frequency — Existing Condition — Post-Development 2-YEAR — 0.3943 CFS — 1.2240 CFS 10-YEAR — 2.2582 CFS — 2.2582 CFS 25-YEAR — 2.7769 CFS — 2.7769 CFS 50-YEAR — 3.1627 CFS — 3.1627 CFS 100-YEAR — 3.5486 CFS — 3.5486 CFS After development, the peak flow rates are not more than the existing condition for 10-year, 25-year, 50-year, and 100-year frequency. For the 2-year frequency storm, the 60”-dia storage pipe with 377-ft in length (7,402.38 cu.ft.) will be used to capture the 2-year runoff volume (7,385.36 cu.ft.). Therefore, the post-developed peak flow rate from this project site will not adversely affect to the downstream properties.

2.2.6. NON-STRUCTURAL SOURCE CONTROL BMPS

NAME	CHECK ONE	
	Included	**Not Applicable**
Education for Property Owners, Tenants and Occupants	☒	☐
Activity Restrictions	☐	☒
Common Area Landscape Management	☒	☐
Common Area Litter Control	☒	☐
Housekeeping of Loading Docks	☐	☒
Common Area Catch Basin Inspection	☒	☐
Street Sweeping Private Streets and Parking Lots	☒	☐

Education for Property Owners, Tenants and Occupants

- Owner shall continue to familiar himself about the impacts that stormwater runoff can have on water quality (Frequency: At all times)
- Owner shall be aware of proper disposal of used materials or hazardous wastes (Frequency: At all times)
- Owner shall implement all BMP maintenance schedule as indicated in the LID Covenant (Frequency: At all times)

Common Area Landscape Management

- Owner shall place the plant debris and street litter immediately into trash containers to prevent the pollutants from entering the storm drains (Frequency: Weekly)
- Employees or Staffs that will be in-charge of landscaping maintenance must be given training by the Owner to properly place the leaves and lawn-clippings into trash after doing the maintenance (Frequency: Annually)

Common Area Litter Control

Owner shall implement trash management and litter control procedures aimed at reducing off site migration of trash. (Frequency: At all times)

- Owner shall inspect the site to ensure that all litter is removed and proper disposal. (Frequency: Weekly)
- Owner shall post “No Littering” signs & enforce anti-litter laws in the site from the completion of the project (Frequency: At all times)
- Owner shall maintain the signage “No Littering” to be visible (Frequency: At all times)

Common Area Catch Basin Inspection

- Owner shall inspect drainage facilities to ensure immediate repair of any deterioration threatening structural integrity (Frequency: Annually and before storm event)
- Owner shall inspect & clean the catch basin before rainy season, the time period between October 1 and April 15 of each year, and re-cleaned as needed before they are 40%full

Street Sweeping Private Streets and Parking Lots

- Owner shall keep the driveway aisles, private driveway and parking lot area clean & orderly. (Frequency: Weekly)
- Owner shall implement sweeping of driveway aisle, private street and parking lot area by a vacuum type cleaner/sweeper. (Frequency: Weekly)
- A contractor shall be hired by the Owner to sweep the site at a regular basis. (Frequency: Weekly)
- Owner shall ensure that private street, driveway aisles and parking area is properly maintain and shall be responsible for the ongoing maintenance. (Frequency: At all times)

2.2.7. Structural Source Control BMPs

NAME	CHECK ONE	
	Included	**Not Applicable**
Provide storm drain system stenciling and signage	☒	☐
Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒
Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐
Protect slopes and channels and provide energy dissipation	☐	☒
Loading docks	☐	☒
Maintenance bays	☐	☒
Vehicle wash areas	☐	☒
Outdoor processing areas	☐	☒
Equipment wash areas/racks	☐	☒
Fueling areas	☐	☒
Hillside landscaping	☐	☒

Provide storm drain system stenciling and signage

- Owner shall maintain the prohibitive language marking, such as “No Dumping-Drains to Ocean” or equally effective phrase on each catch basin on-site (Frequency: At all times)

Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction

- Owner shall implement trash management and litter control procedures aimed at reducing off site migration of trash (Frequency: At all times)
- Owner/tenants/employees shall inspect the site to ensure that all litter is removed and proper disposal (Frequency: Weekly)
- Owner shall post and maintain the signage “No Littering” to be visible and enforce anti-litter laws in the site from completion of the project. (Frequency: At all times)

Use Efficient Irrigation Systems & Landscape Design (The smart irrigation system per Landscape Plan)

- Owner shall hire a licensed landscape to design the irrigation system (Frequency: At the beginning)
- Owner shall inspect the plants, shrubs, and trees are properly irrigated. (Frequency: Weekly)
- Employees or Staffs shall report the deviated sprinkle heads to owner immediately direct the sprinkler heads onto the plants. (Frequency: Weekly)

Attachment A

Calculations

PRELIMINARY

LOW IMPACT DEVELOPMENT CALCULATION

FOR

7539 GARVEY AVE
ROSEMEAD, CA 91770

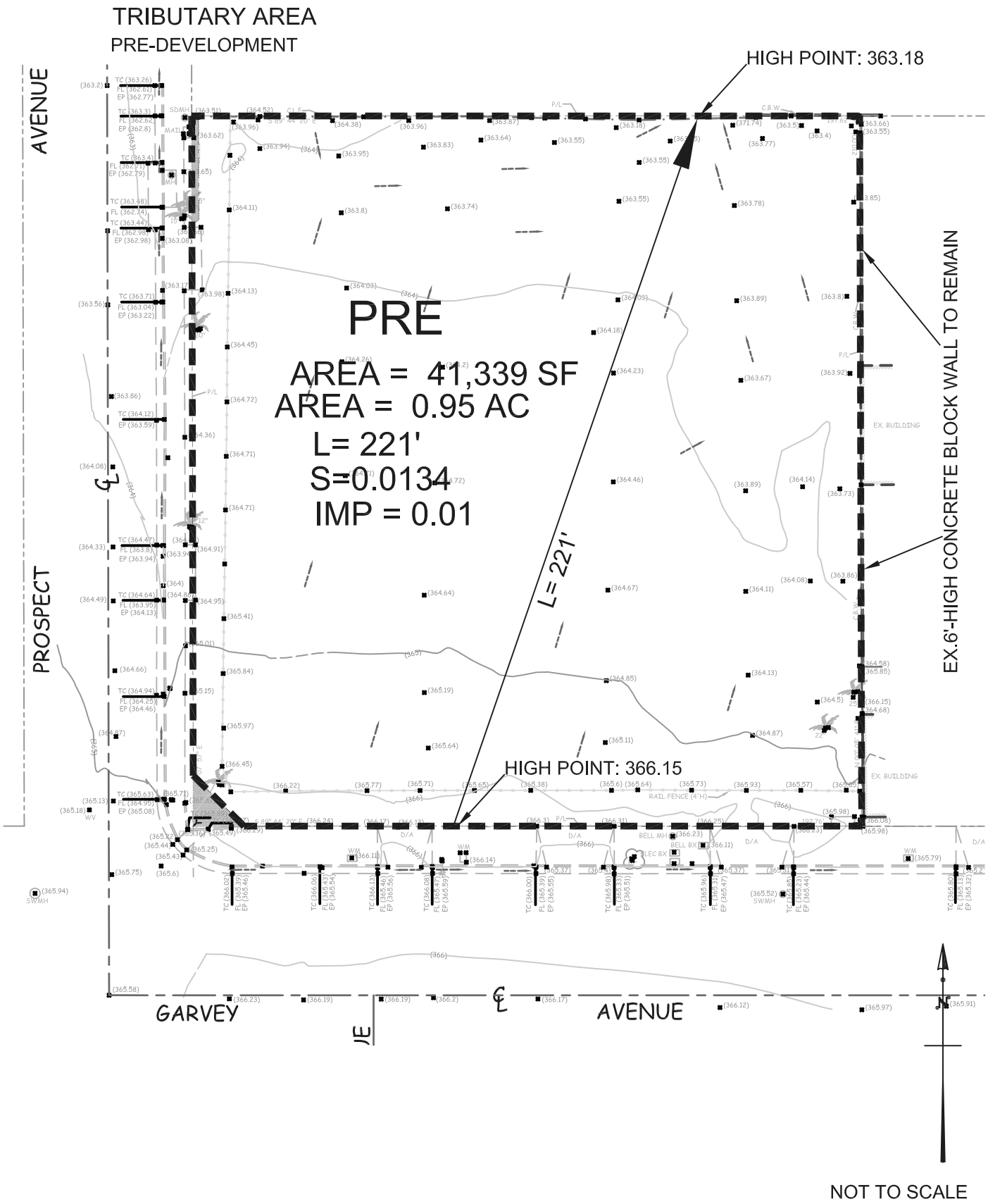
01/06/2022

TRITECH
ENGINEERING
ASSOCIATES

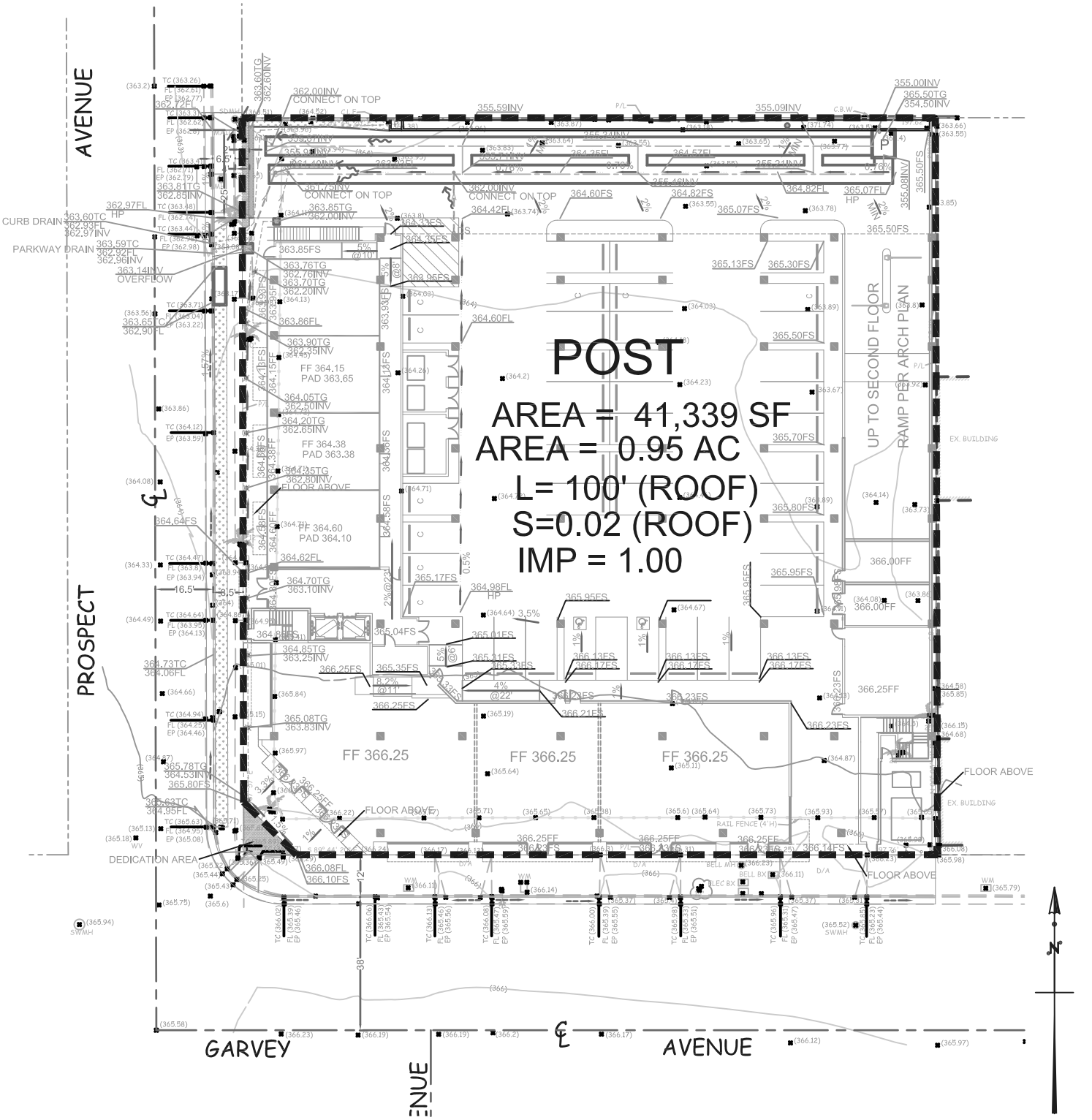
SUBDIVISION
LAND SURVEY
CIVIL ENGINEERING
& DESIGN

135 N. SAN GABRIEL BLVD.
SAN GABRIEL, CA 91775
TEL: (626) 570-1918
EMAIL: info@tritechengineer.com

JOB. NO. 210515


TRIBUTARY AREA
PRE-DEVELOPMENT
HIGH POINT: 363.18
PRE
AREA = 41,339 SF
AREA = 0.95 AC
L= 221'
S=0.0134
IMP = 0.01
L= 221'
EX.6'-HIGH CONCRETE BLOCK WALL TO REMAIN
HIGH POINT: 366.15
PROSPECT AVENUE
GARVEY AVENUE
NOT TO SCALE

TRIBUTARY AREA
POST-DEVELOPMENT



NOT TO SCALE

HYDROLOGY ANALYSIS

FROM L.A. HYDROLOGY MANUAL FIG. H1.20 AND http://dpw.lacounty.gov/wrd/hydrologygis/
SOIL CLASSIFICATION: 013
50 YEAR 24 HOUR ISOHYET = 6.2"
85TH PERCENTILE ISOHYET = 0.9"

PRE-DEVELOPMENT

AREA (ACRE)	LENGTH (FT)	SLOPE	%IMP
0.95	221'	0.0134	0.01

POST-DEVELOPMENT

AREA (ACRE)	LENGTH (FT)	SLOPE	%IMP
0.95	100' (ROOF)	0.02(ROOF)	1.00

NOTE: DUE TO VERY SMALL LANDSCAPE ON GROUND, THEN USE 100%IMPERVIOUS

USE HydroCalc CACULATOR PROGRAM

FREQUENCY	PRE-DEVELOPMENT		POST-DEVELOPMENT	
	Q (CFS)	VOLUME (CU.FT.)	Q (CFS)	VOLUME (CU.FT.)
2-YEAR	0.3943	1,052.69	1.2240	7,385.36
10-YEAR	2.2582	2,542.42	2.2582	13,625.69
25-YEAR	2.7769	3,395.76	2.7769	16,755.41
50-YEAR	3.1627	4,098.31	3.1627	19,083.61
100-YEAR	3.5486	4,864.10	3.5486	21,411.81
85th PERCENTILE			0.3681	2,770.20

FROM HYDROLOGY ANALYSIS, THE POST-DEVELOPED PEAK FLOW RATE ARE NOT MORE THAN THE PRE-DEVELOPED PEAK FLOW RATE IN 10-YEAR, 25-YEAR, 50-YEAR, AND 100-YEAR FREQUENCY.

DUE TO THE 2-YEAR PEAK FLOW RATE AFTER DEVELOPMENT WILL BE MORE THAN THE EXISTING. THE RUNOFF VOLUME FOR 2-YEAR FREQUENCY WILL BE DETAINED ONSITE, THEN THE 2-YEAR PEAK FLOW AFTER DEVELOPMENT WILL BE LESS THAN THE PRE-DEVELOPED PEAK FLOW RATE.

THEREFORE THE PEAK FLOW RATE FROM PROJECT SITE IS NOT ADVERSELY IMPACT TO THE DOWNSTREAM DRAINAGE ELEMENTS.

LOW IMPACT DEVELOPMENT DESIGN

Per Soil Report, the percolation at this site is not feasible. The soil at the site is clay material and doesn't percolate very well. The infiltration rate will be less than 0.3 in/hr. Due to lack of landscape area, then the capture and use system in not feasible.

Therefore the Bio-filtration System will be used for LID BMPs in this project.

Design for BIOFILTRATION SYSTEM

THE SWQDv = 2,770.20 CF

Per Los Angeles County LID manual, the SWQDv = 1.5 x 2,770.20 = 4,155.3 CF

Due to the 2-year frequency runoff volume need to detain onsite, the SWQDv = 7,385.36 CF

USE 377 FEET OF 60"CORRUGATED PIPE TO RETAINED ON-SITE.

VOLUME = $\pi r^2(L) = \pi\ (2.50)^2(377) = 7{,}402.38$ CF

> 7,385.36 CU.FT. OK

THE CAPTURED STORMWATER WILL BE PUMPED TO BIOFILTRATION SYSTEM.

Per LA County LID Manual, the planting media in Bio-filtration System should achieve infiltration rate of at least 5 in/hr. Higher infiltration rates of up to 12 in/hr are permissible.

Use Average Infiltration Rate = 5 in/hr

The Design Infiltration Rate, f_{design} = 5/2 = 2.5 in/hr (Safety of Factor = 2)

The maximum detention time for surface ponding = 96 hours

Use Surface Ponding Depth, d = 1.0'

Then, the Required Detention Time for surface ponding = $t_p = \frac{d}{f_{design}} = \frac{1.0}{(2.50/12)} = 4.8$ hours

Provide planting surface area = 2.5'x150' = 375 SF.

the Biofiltration Design Volume = 375 x 1.0 = 375 CU.FT.

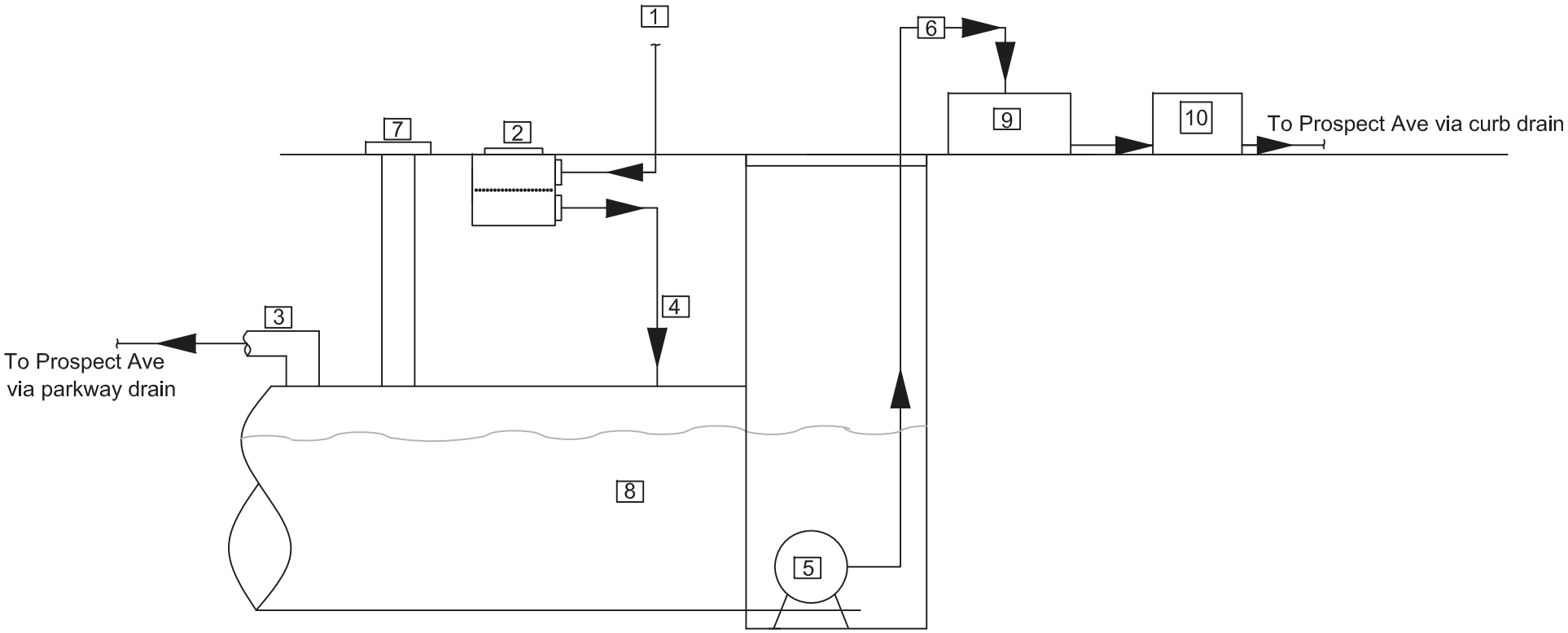
Therefore this Bio-filtration System can treat stormwater 375 CU.FT. in 4.8 hours

Total time to empty storage tank = $\frac{7{,}402.38}{375.00}$ x 4.8 = 94.75 hours < 96 hours OK

The treatment rate for this Biofiltration = 375 CU.FT/4.8 hours = 0.0217 CFS = 9.74 GPM

The pump system has to design to pump stormwater to Biofiltration system not more than 9.74 GPM to prevent overflow bypass the Biofiltration System. Therefore the peak flow rate for 2-year frequency storm will be 9.74 GPM (0.0217 CFS) that is less than the existing condition.

NOTE: The pump calculation will provide in Final Design



1 Rainwater collection point
(Catch Basins, Area Drains, Roof Downspouts)

2 Downspout Filter, Filter Insert Catch Basin, or Filter Insert Trench Drain
(Pre-Treatment) - will provide calculation in Final Design

3 Overflow runoff to Prospect Ave via parkway drain

4 Stormwater inlet to 60"-Storage Pipe

5 PUMP SYSTEM (Flow Rate not more than 9.74 GPM)
- will provide calculation in Final Design

6 Pressurized water outlet to Biofiltration System

7 Stormdrain Cleanout and Observation Pipe

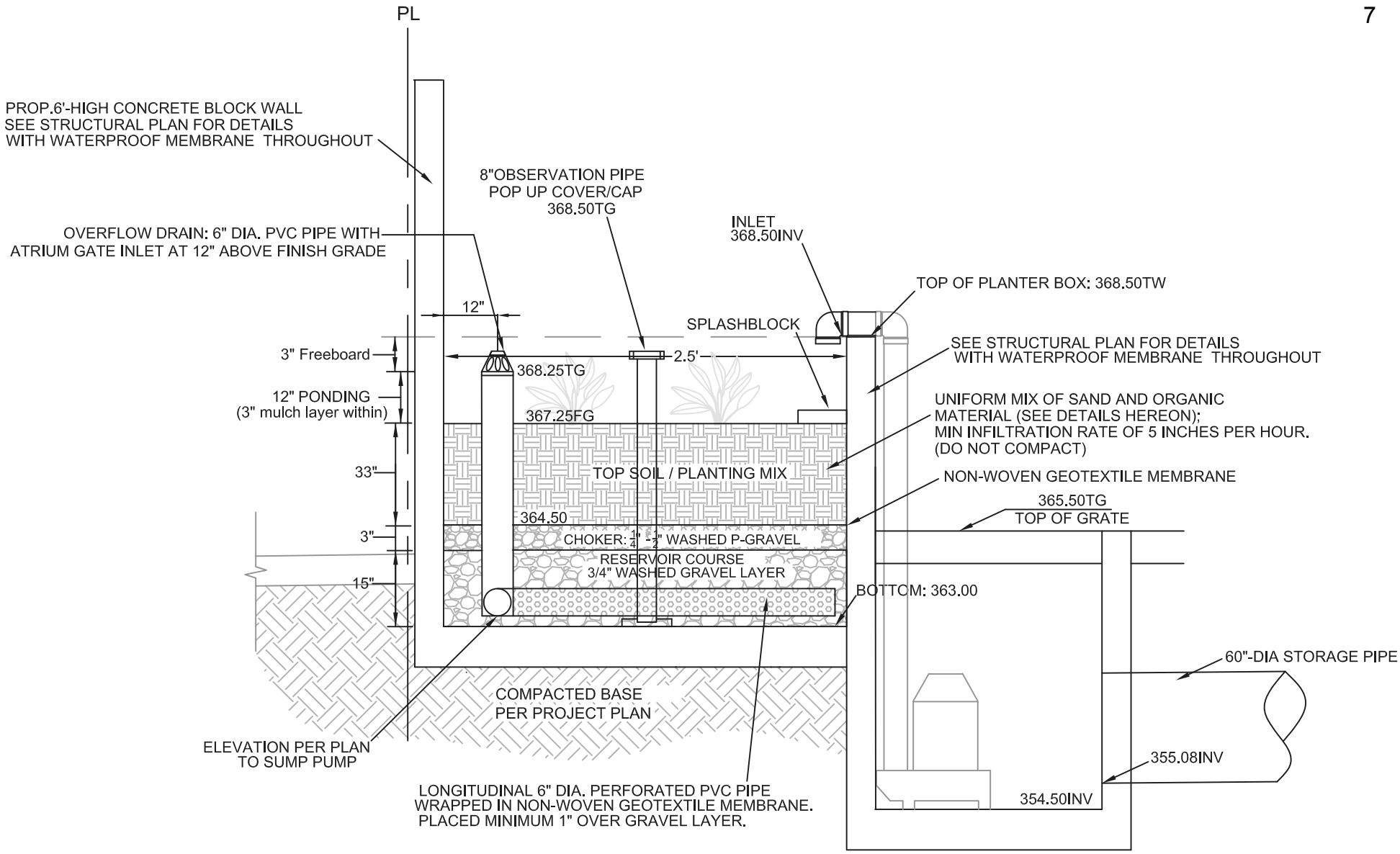
8 377 feet of 60"-Corrugated Pipe (Storage Pipe)

9 BIO-FILTRATION SYSTEM

10 PUMP SYSTEM for outflow from Bio-filtration System
- will provide calculation in Final Design

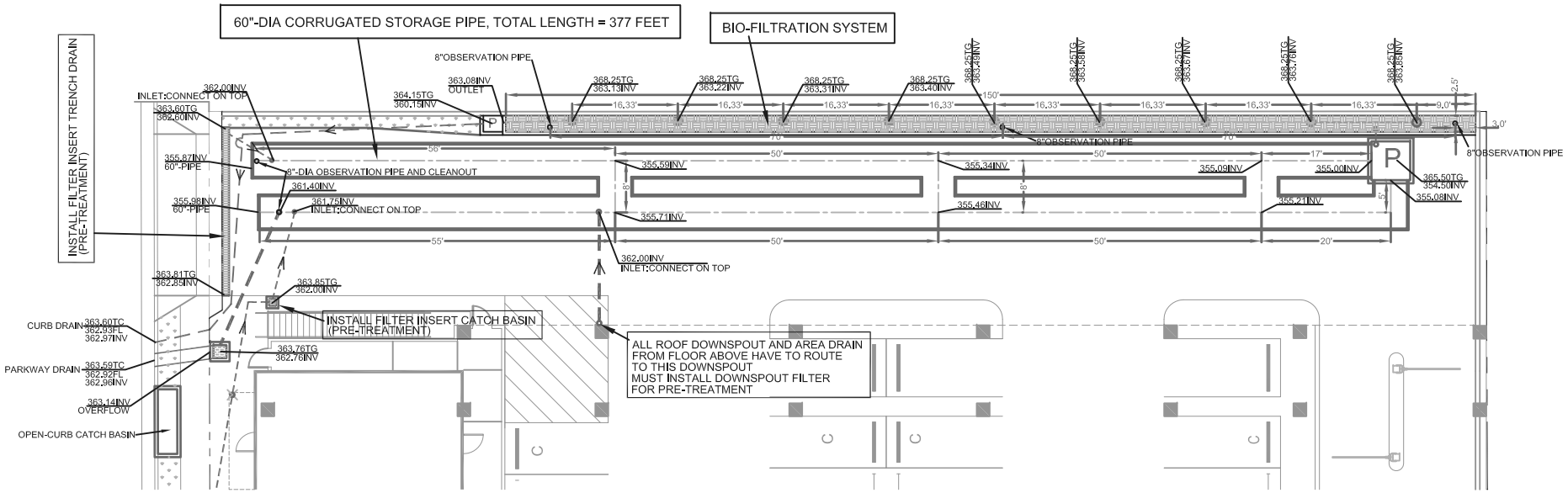
STORMWATER FLOW DIAGRAM(TYP.)

NOT TO SCALE



SECTION(TYP.)

NOT TO SCALE



BIO-FILTRATION SYSTEM AND 60"-STORAGE PIPE SYSTEM

GPS:34.063294, -118.104651 NOT TO SCALE

PLAN

NOT TO SCALE

BIO-FILTRATION SPECIFICATION

Underdrain

Biofiltration areas require an underdrain to collect and discharge stormwater runoff that has been filtered through the soil media, but not infiltrated, to another stormwater quality control measure, storm drain system, or receiving water. The underdrain must have a mainline diameter of eight inches using slotted PVC SDR 26 or PVC C9000. Slotted PVC allows for pressure water cleaning and root cutting, if necessary. The slotted pipe should have two to four rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches wide with a length of 1 to 1.25 inches. Slots should be longitudinally-spaced such that the pipe has a minimum of one square inch opening per lineal foot and should face down.

The underdrain should be placed in a gravel envelope (Class 2 Permeable Material per Caltrans Spec. 68-1.025) that measures three feet wide and six inches deep. The underdrain is elevated from the bottom of the biofiltration area by six inches within the gravel envelope to create a fluctuating anaerobic/aerobic zone below the underdrain to facilitate denitrification within the anaerobic/anoxic zone and reduce nutrient concentrations. The top and sides of the underdrain pipe should be covered with gravel to a minimum depth of 12 inches. The underdrain and gravel envelope should be covered with a geomembrane liner to prevent clogging. The following aggregate should be used for the gravel envelope:

Particle Size (ASTM D422)	%Passing by Weight
¾ inch	100%
¼ inch	30-60%
#8	20-50%
#50	3-12%
#200	0-1%

Underdrains should be sloped at a minimum of 0.5 percent and must drain freely to an approved discharge point.

Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain to provide a clean-out port as well as an observation well to monitor drainage rates. The wells/clean-outs should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/clean-outs should extend six inches above the top elevation of the biofiltration area mulch, and should be capped with a lockable screw cap. The ends of underdrain pipes not terminating in an observation well/clean-out should also be capped.

Hydraulic Restriction Layer

Lateral infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent waterproofing, may be placed along the vertical walls to reduce lateral flows. This geomembrane liner must have a minimum thickness of 30 mils and meet the requirements of Table E-12. Generally, waterproof barriers should not be placed on the bottom of the biofiltration unit, as this would prevent incidental infiltration which is important to meeting the required pollutant load reduction.

Table E-12. Geomembrane Liner Specifications for Biofiltration Areas

Parameter	Test Method	Specifications
Material		Nonwoven geomembrane liner
Unit weight		8 oz/yd^3 (minimum)
Filtration rate		0.08 in/sec (minimum)
Puncture strength	ASTM D-751 (Modified)	125 lbs (minimum)
Mullen burst strength	ASTM D-751	400 lb/in2 (minimum)
Tensile strength	AST D-1682	300 lbs (minimum)
Equiv. opening size	US Standard Sieve	No. 80 (minimum)

Planting / Storage Media

* The planting media placed in the biofiltration area should achieve a long-term, in-place infiltration rate of at least 5 in/hr. Higher infiltration rates of up to 12 in/hr are permissible. The biofiltration soil media must retain sufficient moisture to support vigorous plant growth.
* The planting media mix must consist of 60 to 80 percent sand and 20 to 40 percent compost.
* Sand should be free of wood, waste, coatings such as clay, stone dust, carbonate, or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for biofiltration should be analyzed by an accredited laboratory using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D422 or as approved by the local permitting authority) and meet the following gradations (Note: all sand complying with ASTM C33 for fine aggregate comply with the gradation requirements listed below):

Particle Size (ASTM D422)	%Passing by Weight
3/8 inch	100%
#4	90-100%
#8	70-100%
#16	40-95%
#30	15-70%
#40	5-55%
#110	0-15%
#200	0-5%

Note: The gradation of the sand component of the biofiltration soil media is believed to be a major factor in the infiltration rate of the media mix. If the desired hydraulic conductivity of the biofiltration soil media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified minimum percent passing.

* Compost should be a well-decomposed, stable, weed-free organic matter source derived from waste materials including yard debris, wood wastes, or other organic material not including manure or biosolids meeting standards developed by the USCC. The product shall be certified through the USCC STA Program (a compost testing and information disclosure program). Compost quality shall be verified via a laboratory analysis to be:
    - Feedstock materials must be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
    - pH between 6.5 and 8.0 (may vary with plant palette)
    - Organic Matter: 35 to 75 percent dry weight basis
    - Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
    - Maturity/Stability: Compost must have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120°F) upon delivery or rewetting is not acceptable.
    - Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
        - NH4:NH3 < 3
        - Ammonium < 500 ppm, dry weight basis
        - Seed germination > 80 percent of control
        - Plant trials > 80 percent of control
        - Solvita® > 5 index value
    - Nutrient content:
        - Total Nitrogen content ≥ 0.9 percent preferred
        - Total Boron should be < 80 ppm; soluble boron < 2.5 ppm
    - Salinity: < 6.0 mmhos/cm
    - Compost for biofiltration area should be analyzed by an accredited laboratory using #200, ¼-inch, ½-inch, and 1-inch sieves (ASTM D422) and meet the gradation requirements in the table below:

Particle Size (ASTM D422)	%Passing by Weight
1 inch	99-100
1/2 inch	90-100
1/4 inch	40-90
#200	2-10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

The gradation of compost used in biofiltration soil media is believed to play an important role in the saturated infiltration rate of the media. To achieve a higher saturated infiltration rate, it may be necessary to utilize compost at the coarser end of the range (minimum percent passing). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, coarser compost mix provides more heterogeneity of the biofiltration soil media, which is believed to be advantageous for more rapid development of soil structure needed to support healthy biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

* Biofiltration soil media not meeting the above criteria should be evaluated on a case-by-case basis. Alternative biofiltration soil media must meet the following specifications:

"Soils for biofiltration facilities must be sufficiently permeable to infiltrate stormwater runoff at a minimum of rate of 5 in/hr during the life of the facility, and provide sufficient retention of moisture and nutrients to support healthy vegetation." The following steps shall be followed by LACDPW to verify that alternative biofiltration soil media mixes meet the specification:

o Submittals - The applicant must submit to LACDPW for approval:
- A sample of mixed biofiltration soil media.
- Certification from the soil supplier or an accredited laboratory that the biofiltration soil media meets the requirements of this specification.
- Certification from an accredited geotechnical testing laboratory that the biofiltration soil media has an infiltration rate between 5 and 12 in/hr.
- Organic content test results of the biofiltration soil media. Organic content test shall be performed in accordance with the Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method".
- Organic grain size analysis results of mixed biofiltration soil media performed in accordance with ASTM D422, Standard Test Method for Particle Size Analysis of Soils.
- A description of the equipment and methods used to mix the sand and compost to produce the biofiltration soil media.

o The name of the testing laboratory(ies) and the following information:
- Contact person(s)
- Address(es)
- Phone contact(s)
- E-mail address(es)
- Qualifications of laboratory(ies) and personnel including date of current certification by STA, ASTM, or approved equal.

o Biofiltration soils shall be analyzed by an accredited laboratory using #200 and ½-inch sieves (ASTM D422 or as approved by LACDPW), and meet the gradation described in the table below:

Particle Size (ASTM D422)	%Passing by Weight
1/2 inch	97-100
#200	2-5

* Biofiltration soil media shall be analyzed by an accredited geotechnical laboratory for the following tests:
o Moisture - density relationships (compaction tests) must be conducted on biofiltration soil media. Biofiltration soil media for the permeability test shall be compacted to 85 to 90 percent of the maximum dry density (ASTM D1557).
o Constant head permeability testing in accordance with ASTM D2434 shall be conducted on a minimum of two samples with a 6-inch mold and vacuum saturation.
* Mulch is recommended for the purpose of retaining moisture, preventing erosion,

and minimizing weed growth. Projects subject to the California Model Water Efficiency Landscaping Ordinance (or comparable local ordinance) will be required to provide at least 2 inches of mulch. Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps soil moist, and replenishes soil nutrients. Biofiltration areas must be covered with two to four inches (average three inches) of mulch at the start and an annual placement (preferably in June after

* The planting media design height must be marked appropriately, such as a collar on weeding) of one to two inches of mulch beneath plants.

the overflow device or with a stake inserted two feet into the planting media and notched, to show biofiltration surface level and ponding level.

Vegetation

Prior to installation, a licensed landscape architect must certify that all plants, unless otherwise specifically permitted, conform to the standards of the current edition of American Standard for Nursery Stock as approved by the American Standards Institute, Inc. All plant grades shall be those established in the current edition of American Standards for Nursery Stock.

- Shade trees must have a single main trunk. Trunks must be free of branches below the following heights:

CALIPER (in)	Height (ft)
1½-2½	5
3	6

- Plants must be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 96 hours.
- It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs must be used to the maximum extent practicable.

The biofiltration area should be vegetated to resemble a terrestrial forest community ecosystem, which is dominated by understory trees, a shrub layer, and herbaceous ground cover. Select vegetation that:

- Is suited to well-drained soil;
- Will be dense and strong enough to stay upright, even in flowing water;
- Has minimum need for fertilizers;
- Is not prone to pests and is consistent with Integrated Pest Management practices; and
- Is consistent with local water conservation ordinance requirements.

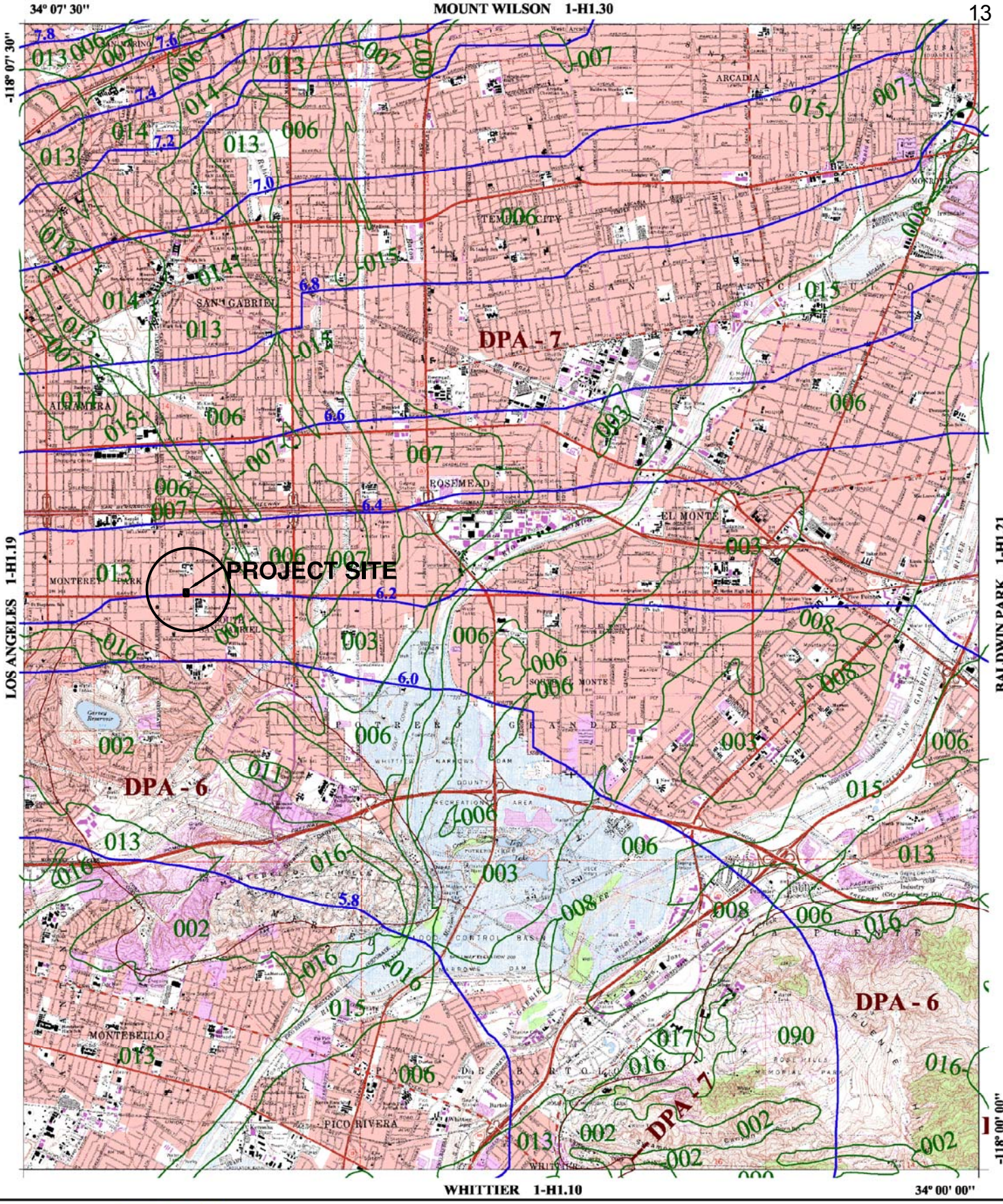
Irrigation System

Provide an irrigation system to maintain viability of vegetation, if applicable. The irrigation system must be designed to local code or ordinance specifications.

Overflow Device

An overflow device is required at the 18-inch ponding depth. The following, or equivalent, should be provided:

- A vertical PVC pipe (SDR 26) to act as an overflow riser.
- The overflow riser(s) should be eight inches or greater in diameter, so it can be cleaned without damage to the pipe.
- The inlet to the riser should be at the ponding depth (18 inches for fenced biofiltration areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued (e.g., not removable).
  The overflow device should convey stormwater runoff in excess of 1.5 times the SWQDv that is not reliably retained on the project site to an approved discharge location (another stormwater quality control measure, storm drain system, or receiving water).



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

N W E S

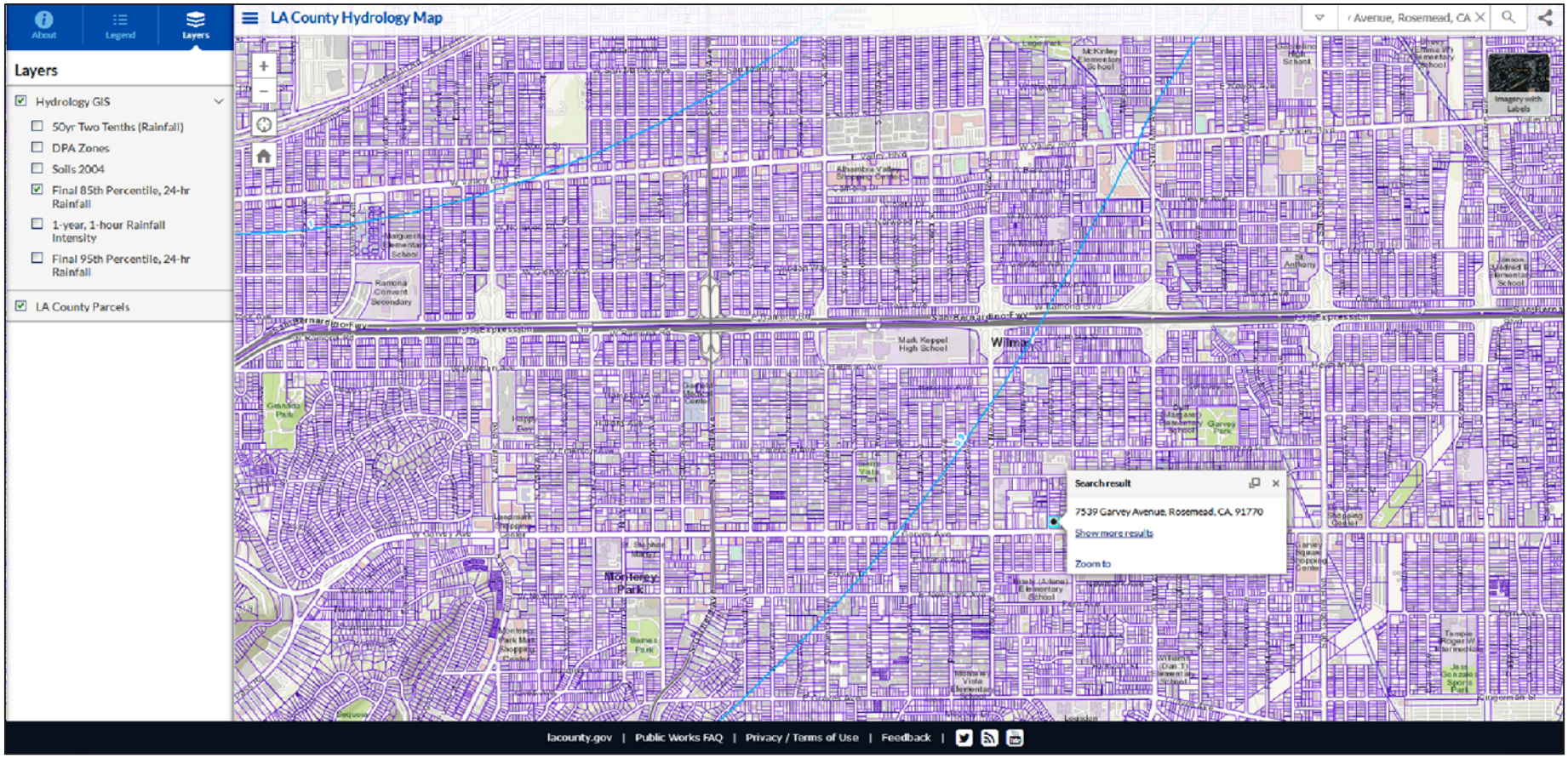
1 0 1 2 Miles

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

EL MONTE
50-YEAR 24-HOUR ISOHYET

1-H1.20

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works


About
Legend
Layers
LA County Hydrology Map
Layers
Hydrology GIS
50yr Two Tenths (Rainfall)
DPA Zones
Soils 2004
Final 85th Percentile, 24-hr Rainfall
1-year, 1-hour Rainfall Intensity
Final 95th Percentile, 24-hr Rainfall
LA County Parcels
Search result
7539 Garvey Avenue, Rosemead, CA 91770
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Monterey Park
Mark Keppel High School
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Peak Flow Hydrologic Analysis

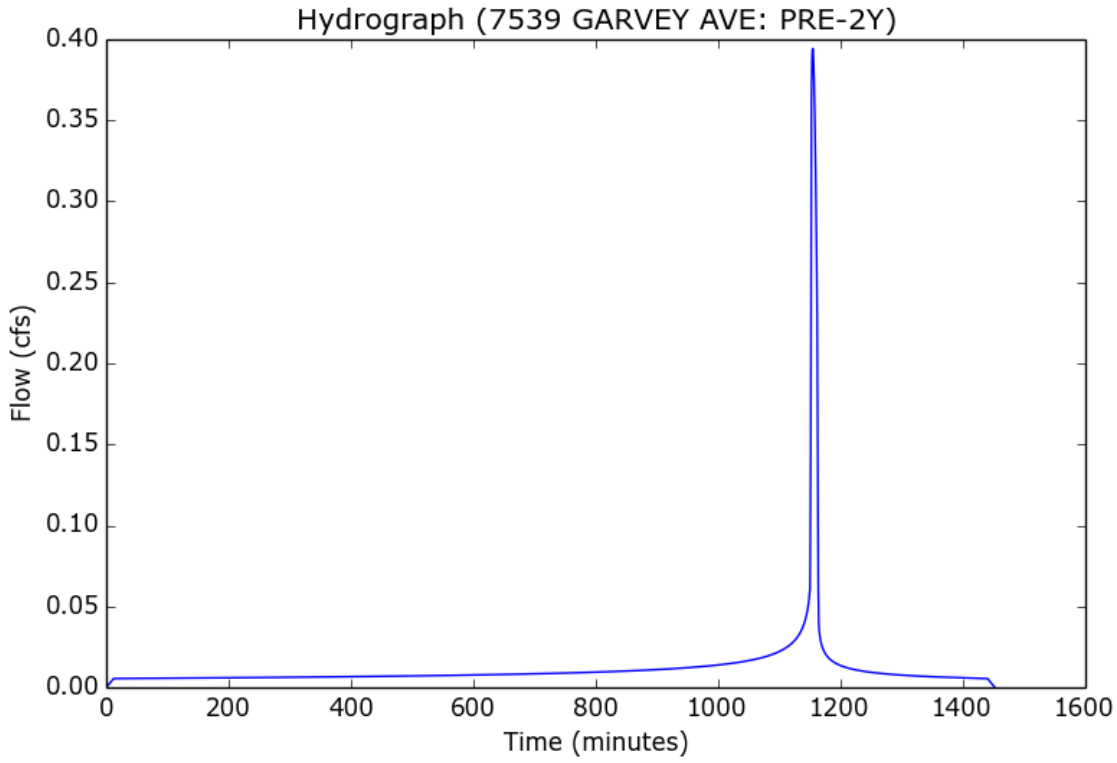
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	PRE-2Y
Area (ac)	0.95
Flow Path Length (ft)	221.0
Flow Path Slope (vft/hft)	0.0134
50-yr Rainfall Depth (in)	6.2
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.3994
Peak Intensity (in/hr)	0.9487
Undeveloped Runoff Coefficient (Cu)	0.4329
Developed Runoff Coefficient (Cd)	0.4375
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	0.3943
Burned Peak Flow Rate (cfs)	0.3943
24-Hr Clear Runoff Volume (ac-ft)	0.0242
24-Hr Clear Runoff Volume (cu-ft)	1052.6878



Peak Flow Hydrologic Analysis

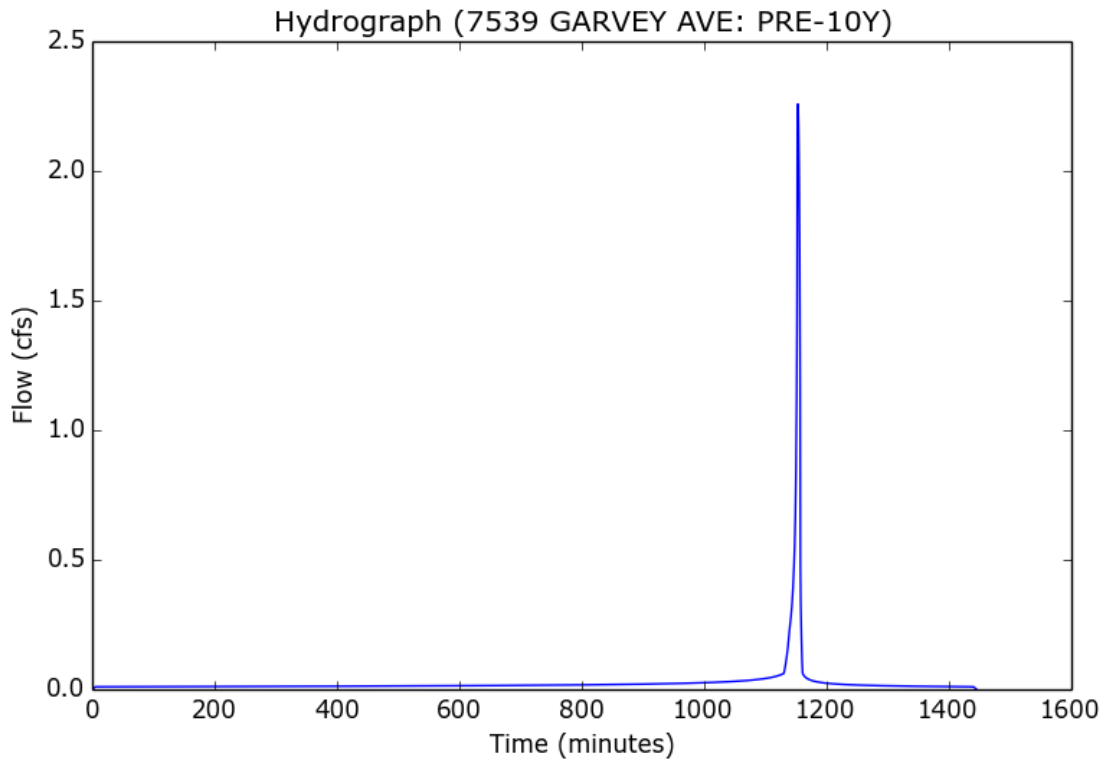
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	PRE-10Y
Area (ac)	0.95
Flow Path Length (ft)	221.0
Flow Path Slope (vft/hft)	0.0134
50-yr Rainfall Depth (in)	6.2
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.4268
Peak Intensity (in/hr)	2.6412
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.2582
Burned Peak Flow Rate (cfs)	2.2582
24-Hr Clear Runoff Volume (ac-ft)	0.0584
24-Hr Clear Runoff Volume (cu-ft)	2542.4217



Peak Flow Hydrologic Analysis

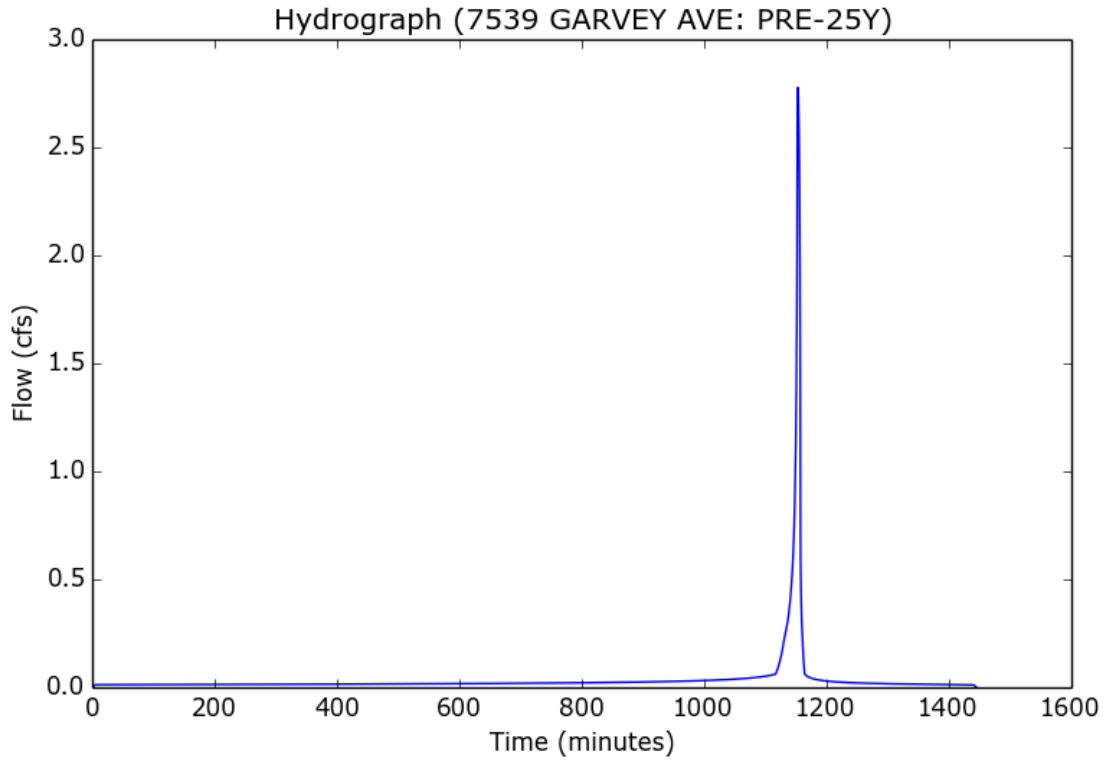
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	PRE-25Y
Area (ac)	0.95
Flow Path Length (ft)	221.0
Flow Path Slope (vft/hft)	0.0134
50-yr Rainfall Depth (in)	6.2
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.7769
Burned Peak Flow Rate (cfs)	2.7769
24-Hr Clear Runoff Volume (ac-ft)	0.078
24-Hr Clear Runoff Volume (cu-ft)	3395.7594



Peak Flow Hydrologic Analysis

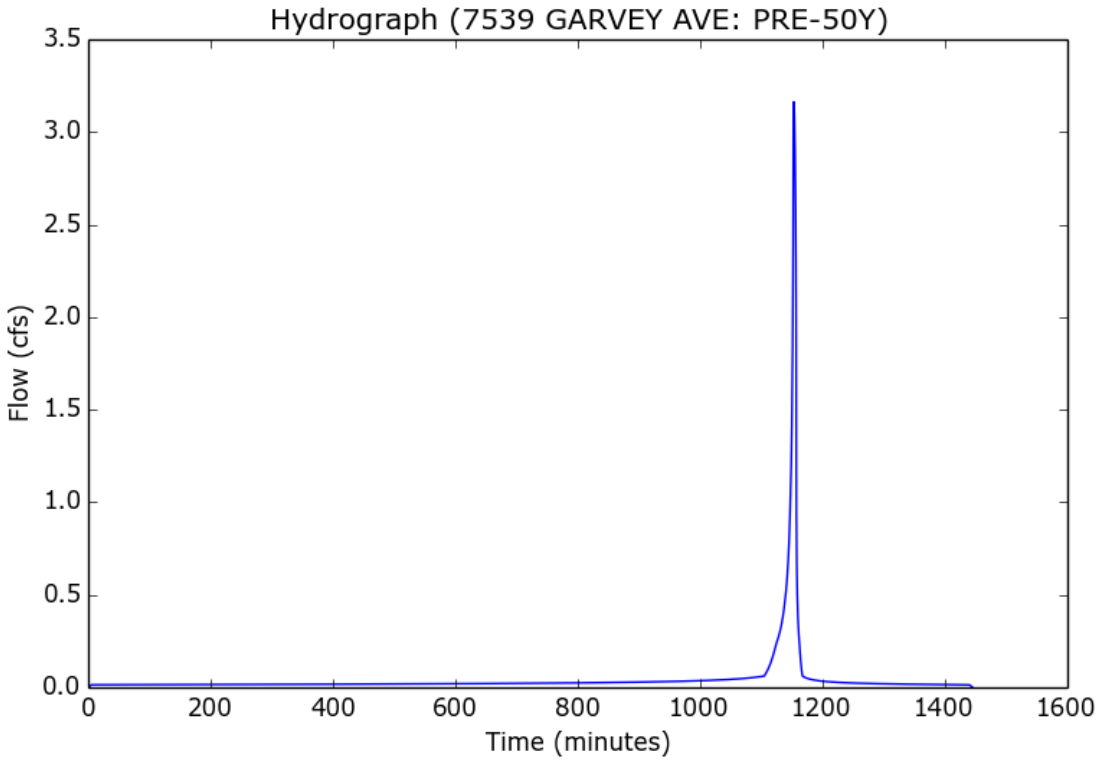
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	PRE-50Y
Area (ac)	0.95
Flow Path Length (ft)	221.0
Flow Path Slope (vft/hft)	0.0134
50-yr Rainfall Depth (in)	6.2
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.1627
Burned Peak Flow Rate (cfs)	3.1627
24-Hr Clear Runoff Volume (ac-ft)	0.0941
24-Hr Clear Runoff Volume (cu-ft)	4098.318



Peak Flow Hydrologic Analysis

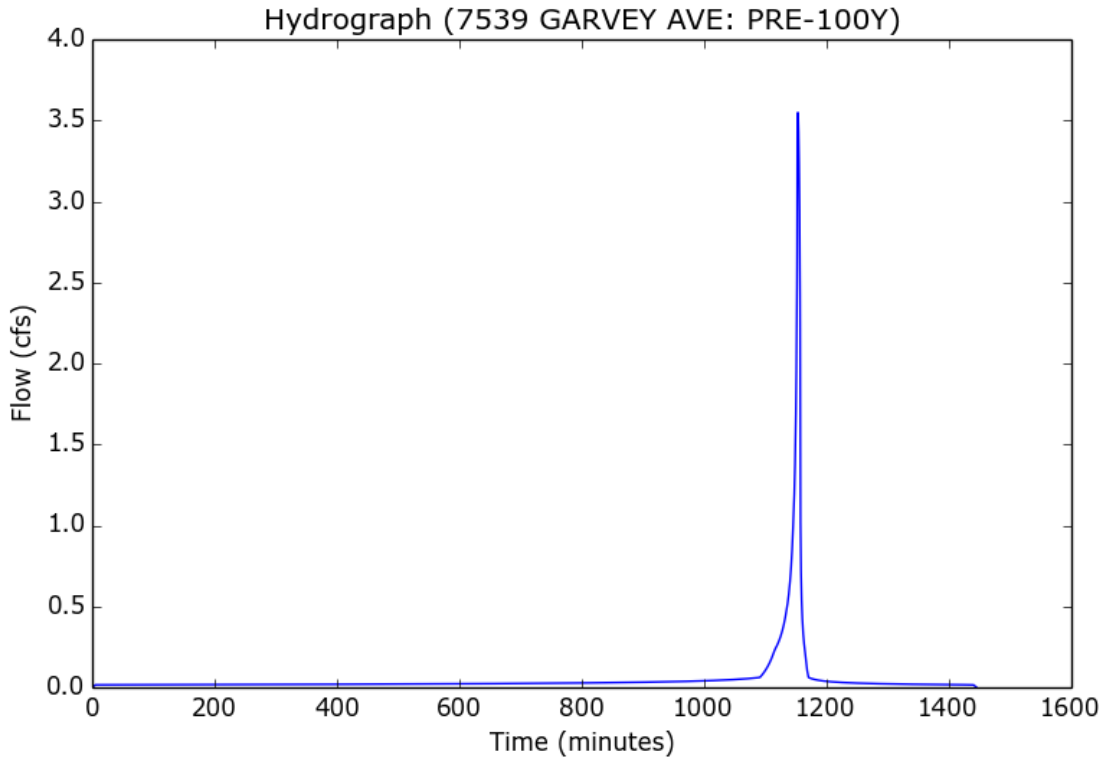
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	PRE-100Y
Area (ac)	0.95
Flow Path Length (ft)	221.0
Flow Path Slope (vft/hft)	0.0134
50-yr Rainfall Depth (in)	6.2
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.5486
Burned Peak Flow Rate (cfs)	3.5486
24-Hr Clear Runoff Volume (ac-ft)	0.1117
24-Hr Clear Runoff Volume (cu-ft)	4864.098



Peak Flow Hydrologic Analysis

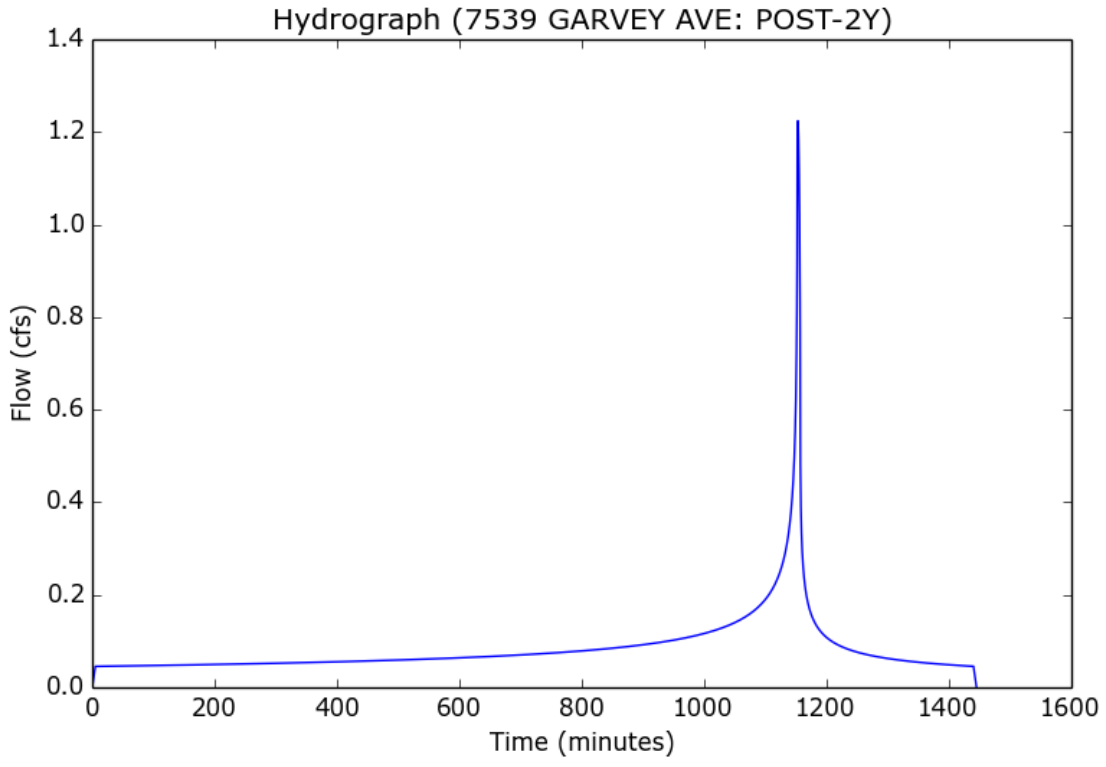
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	POST-2Y
Area (ac)	0.95
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.3994
Peak Intensity (in/hr)	1.4315
Undeveloped Runoff Coefficient (Cu)	0.6658
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.224
Burned Peak Flow Rate (cfs)	1.224
24-Hr Clear Runoff Volume (ac-ft)	0.1695
24-Hr Clear Runoff Volume (cu-ft)	7385.3555



Peak Flow Hydrologic Analysis

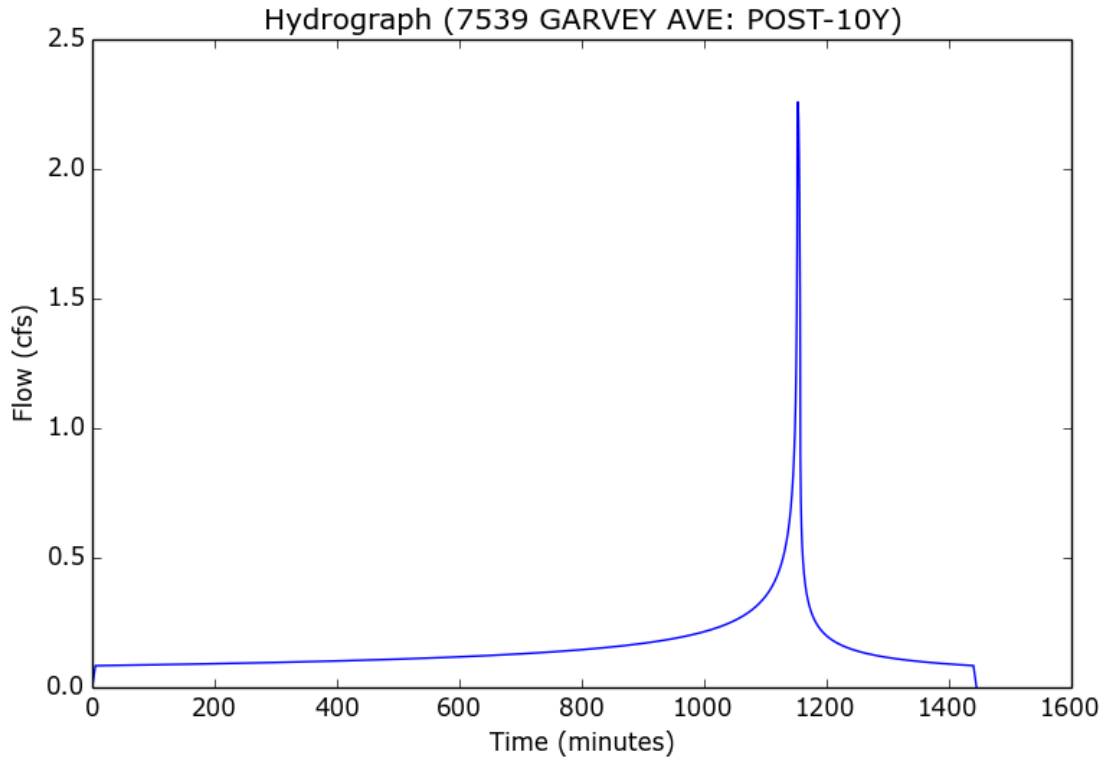
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	POST-10Y
Area (ac)	0.95
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.4268
Peak Intensity (in/hr)	2.6412
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.2582
Burned Peak Flow Rate (cfs)	2.2582
24-Hr Clear Runoff Volume (ac-ft)	0.3128
24-Hr Clear Runoff Volume (cu-ft)	13625.6947



Peak Flow Hydrologic Analysis

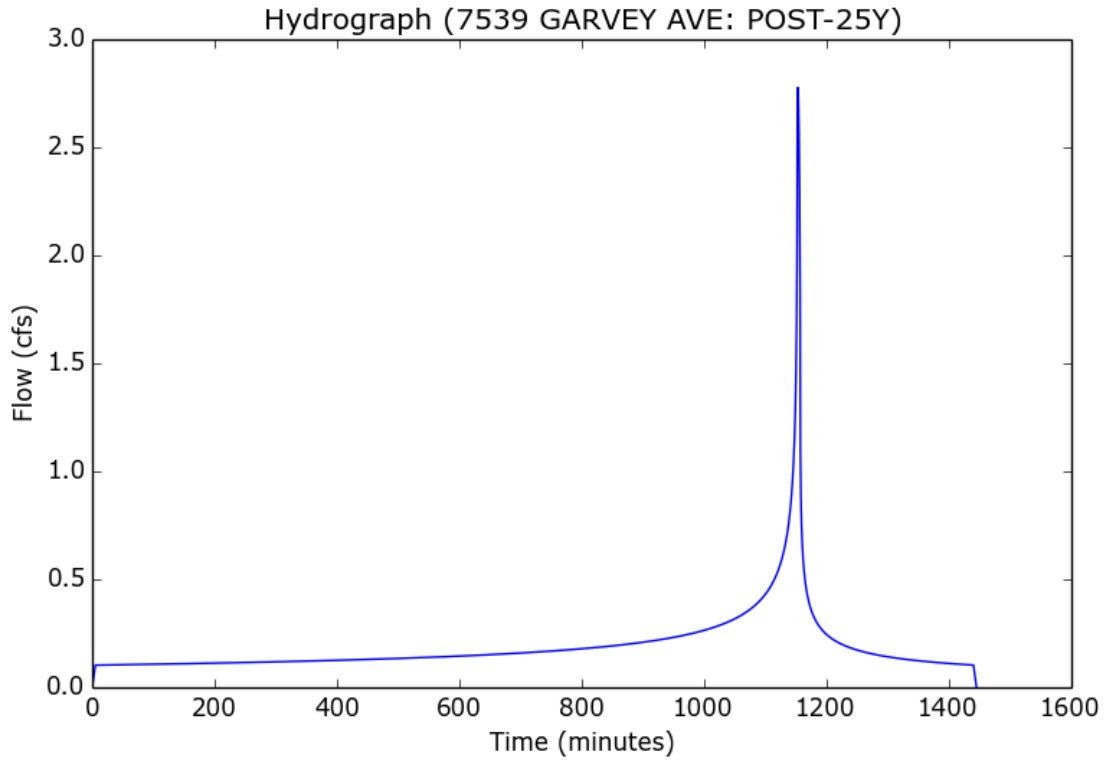
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	POST-25Y
Area (ac)	0.95
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.7769
Burned Peak Flow Rate (cfs)	2.7769
24-Hr Clear Runoff Volume (ac-ft)	0.3847
24-Hr Clear Runoff Volume (cu-ft)	16755.4061



Peak Flow Hydrologic Analysis

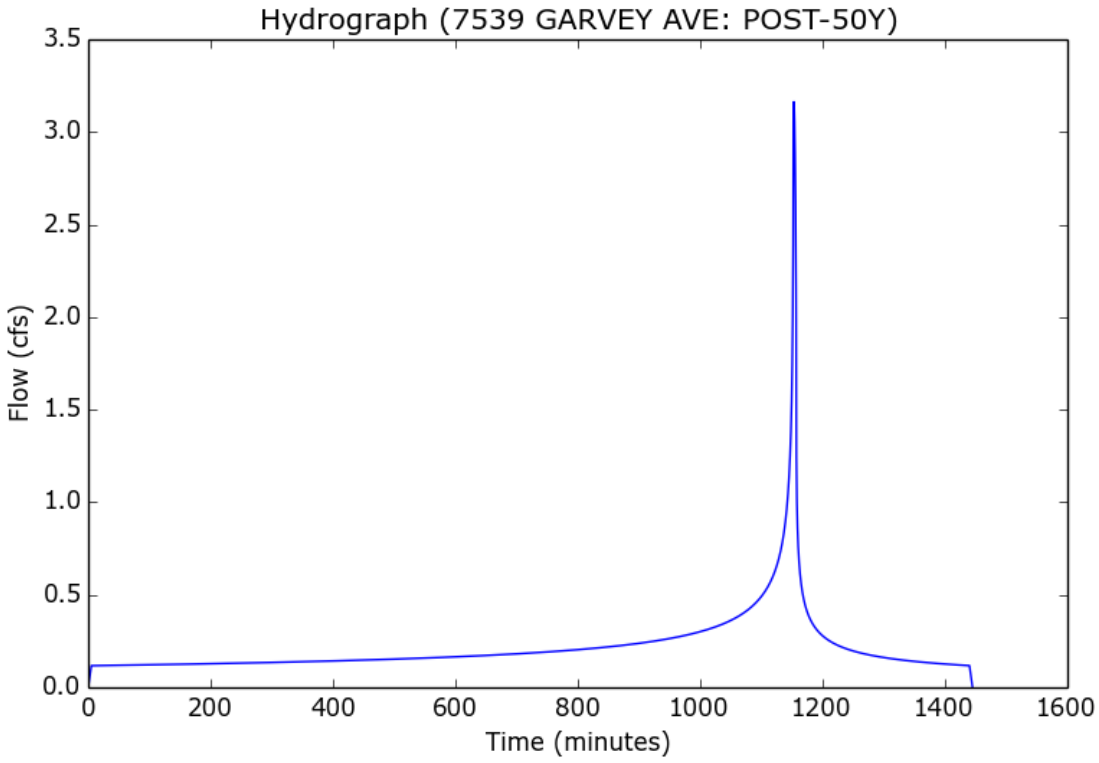
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	POST-50Y
Area (ac)	0.95
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.1627
Burned Peak Flow Rate (cfs)	3.1627
24-Hr Clear Runoff Volume (ac-ft)	0.4381
24-Hr Clear Runoff Volume (cu-ft)	19083.606



Peak Flow Hydrologic Analysis

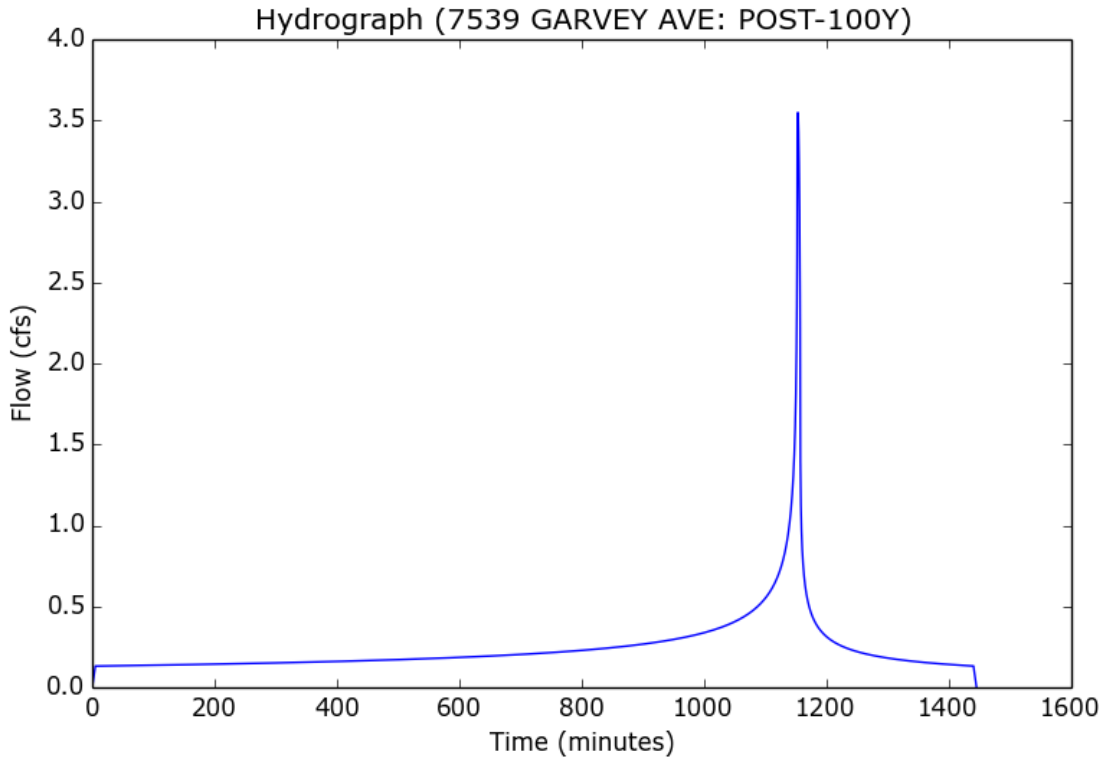
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	POST-100Y
Area (ac)	0.95
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.5486
Burned Peak Flow Rate (cfs)	3.5486
24-Hr Clear Runoff Volume (ac-ft)	0.4915
24-Hr Clear Runoff Volume (cu-ft)	21411.8059



Peak Flow Hydrologic Analysis

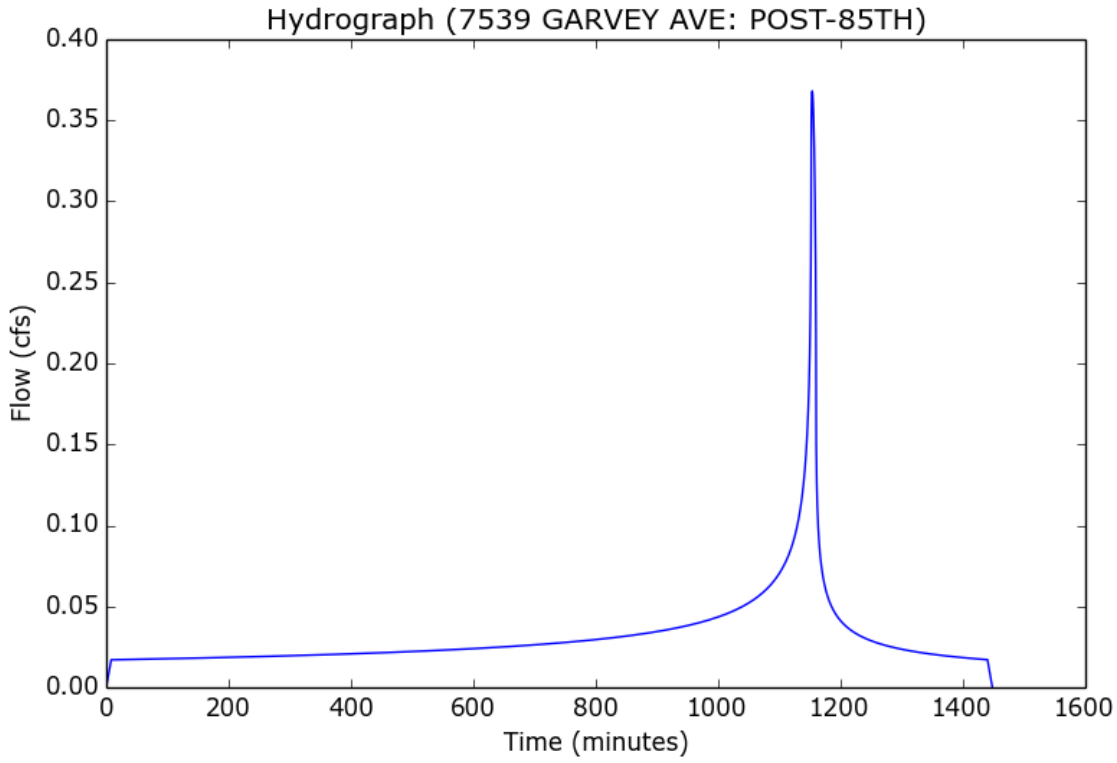
File location: D:/Smith/210515 (7539 Garvey Ave., Rosemead, CA 91770)-11-15-21++/Grading/LID -11-
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7539 GARVEY AVE
Subarea ID	POST-85TH
Area (ac)	0.95
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	0.9
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.9
Peak Intensity (in/hr)	0.4305
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.3681
Burned Peak Flow Rate (cfs)	0.3681
24-Hr Clear Runoff Volume (ac-ft)	0.0636
24-Hr Clear Runoff Volume (cu-ft)	2770.2022



Attachment B

Soil Report

Environmental Geotechnology Laboratory, Inc.

September 30, 2021

Scales Lab Architects
970 N. Broadway, Suite 107
Los Angeles, California 90012

Subject: **Report of Geotechnical Engineering Investigation, Proposed Mixed-Use Buildings and Associated Structures, APN: 5286-022-009 & 010, 7539 & 7545 Garvey Avenue, Rosemead, County of Los Angeles, California, EGL Project No.: 21-AA-106GE**

Ladies and Gentlemen:

In accordance with your request, Environmental Geotechnology Laboratory, Inc. (EGL) is pleased to submit this Geotechnical Engineering Report for the subject site. The purpose of this report was to evaluate the subsurface conditions and provide recommendations for foundation designs and other relevant parameters of the proposed construction.

Based on the findings of our field exploration, laboratory testing and engineering analysis, the proposed construction of the subject site for the intended use is considered feasible from the geotechnical engineering viewpoints, provided that specific recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,
Environmental Geotechnology Laboratory, Inc.

Ryan Jones, GE 2852
Project Engineer

Dist: (4) Addressee
RJ/ky

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed

Mixed-Use Buildings and Associated Structures

At

APN: 5286-022-009 & 010

7539 & 7545 Garvey Avenue
Rosemead, California

Prepared by

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY, INC.

Project No.: 21-AA-106GE

September 30, 2021

TABLE OF CONTENT

1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of EGL's preliminary geotechnical engineering investigation for the proposed development located at 7539 & 7545 Garvey Avenue (APN: 5286-022-009 & 010) in the City of Rosemead, County of Los Angeles, California. The approximate regional location is shown on the Site Location Map (Figure 1). Purposes of this investigation were to evaluate subsurface conditions at the subject site and to provide preliminary recommendations pertinent to grading, including foundation design and other relevant parameters for future development.

1.2 Scope of Services

Our scope of services included:

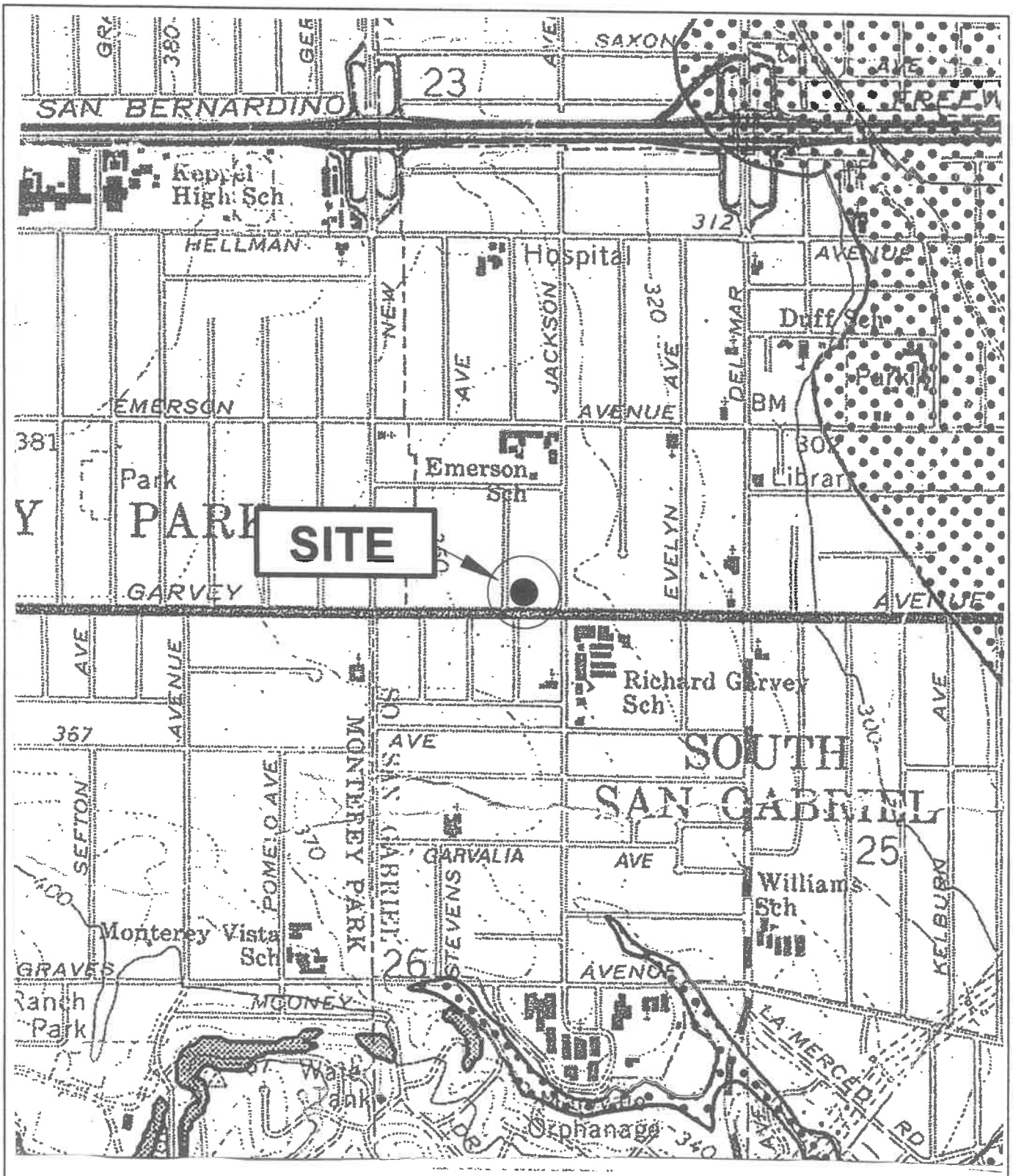
- Review of available soil data of the area.
- Subsurface exploration consisting of logging and sampling of five (5) 8-inch diameter hollow-stem auger borings. Borings were extended to a maximum depth of 30.0 feet below the existing ground surface. The boring logs are presented in Appendix A.
- Laboratory testing of representative samples to establish engineering characteristics of the on-site soil. The laboratory test results are presented in Appendix B and on the Boring Logs of Appendix A.
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Infiltration testing on boring (B-1) at a depth of 8 feet.
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed construction.

1.3 Site Conditions

The subject site is located on the northeast corner of Garvey Avenue and Prospect Avenue in the City of Rosemead, County of Los Angeles, California. The approximate regional location is shown on the Site Location Map (Figure 1). The project site consists of two lots (7539 & 7545 Garvey Avenue) and is currently vacant. Topographically, the subject site is relatively flat. Detailed configurations of the site are shown on the Site Plan, Figure 2.

1.4 Proposed Construction

Based on the *Site Plan* provided by Scales Lab Architects (2021), it is our understanding that the proposed development at the site consists of new mixed-use buildings and associated



Note: Map modified from "Seismic Hazard Zones, El Monte Quadrangle" by California Department of Conservation, Division of Mines and Geology.

Approximate Scale: 1" = 1000'

Potential Liquefaction Area

Potential Earthquake-Induced Landslide Areas

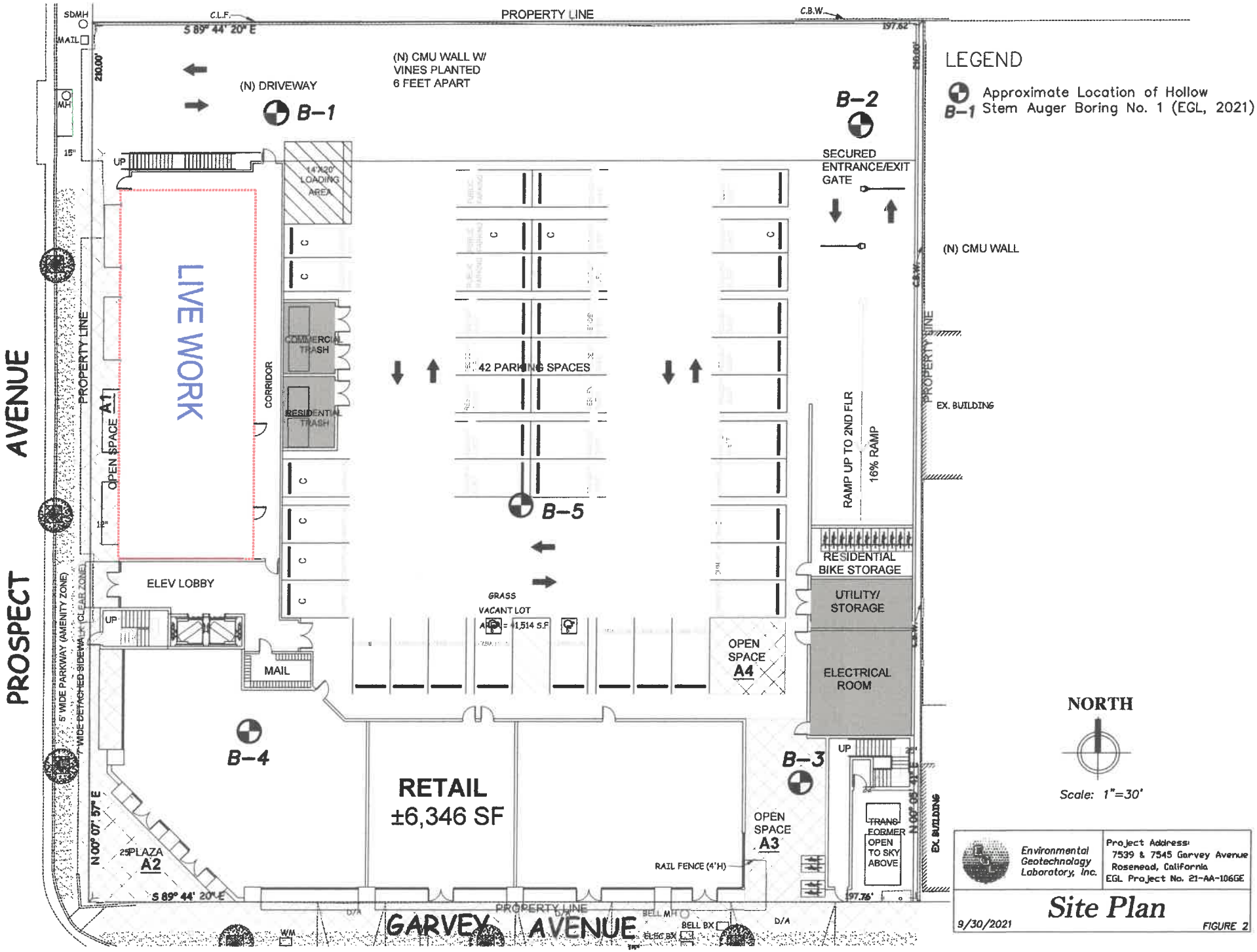
ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

Project Address:
7539 & 7545 Garvey Avenue
Rosemead, California

SITE LOCATION MAP

09/21

Figure 1



Environmental Geotechnology Laboratory, Inc.

Project Address:
7539 & 7545 Garvey Avenue
Rosemead, California
EGL Project No. 21-AA-106GE

Site Plan

9/30/2021

FIGURE 2

structures. The proposed buildings are anticipated to be seven-story wood frame structures with concrete slab-on-grade. Column loads are unknown at this time, but are expected to be light to medium. Minor cut/fill grading operation is anticipated to achieve the desired grades.

2.0 FIELD EXPLORATION AND LABORATORY TESTING

2.1 Field Exploration

Our field exploration was performed at the subject property September 8, 2021 with the aid of a hollow-stem drill rig of ACE Drilling Services. A total of five (5) 8-inch diameter hollow-stem auger borings were drilled to a maximum depth of 30.0 feet below the existing ground surface. Upon completion of drilling and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. The purpose of the excavation was to investigate the engineering characteristics of the onsite soils with respect to the proposed development.

The borings were supervised and logged by EGL's engineer. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. The approximate locations of these borings are shown on the Site Plan (Figure 2). Logs of borings are presented in Appendix A. Ring samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content and density, direct shear strength, consolidation, corrosion potential, expansion index and Atterberg Limits. The results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are presented on the boring logs in Appendix A.

3.0 SUMMARY OF GEOTECHNICAL CONDITIONS

3.1 Soil Conditions

Our subsurface exploration and testing program revealed the existence of alluvial soil to the maximum explored depth of 30.0 feet. The onsite soils consist predominantly of dark yellowish brown and olive brown sandy clayey silt (ML) and sandy clay (CL). In general, our boring B-5 encountered dark yellowish brown, slightly moist to moist, and stiff sandy clayey silt (ML) to a depth of approximately 3.0 feet. Below this, layers of olive brown and dark yellowish brown, slightly moist to very moist, and stiff to very stiff sandy clay (CL) were encountered to the

maximum explored depth of 30.0 feet below the existing ground surface. Refusal was encountered within boring B-3 at depth of 16.0 feet due to the very dense and hard soil. Based on Dibblee (1989), the site is underlain by slightly elevated and locally dissected alluvial gravel and sand at base of hill areas (Qae; see Figure 3).

3.2 Groundwater

Static ground water levels were not encountered during our subsurface investigation to the maximum explored depth of 30 feet below the existing ground surface. Based on the historically high groundwater depth map prepared by CDMG Seismic Hazard Zone Report 024 the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (High Ground Water Map El Monte Quadrangle). Groundwater is therefore not expected to be a significant constraint during the construction. However, groundwater may be a significant constraint if grading is completed during the rainy season when perched water is more likely to occur.

4.0 CONCLUSIONS

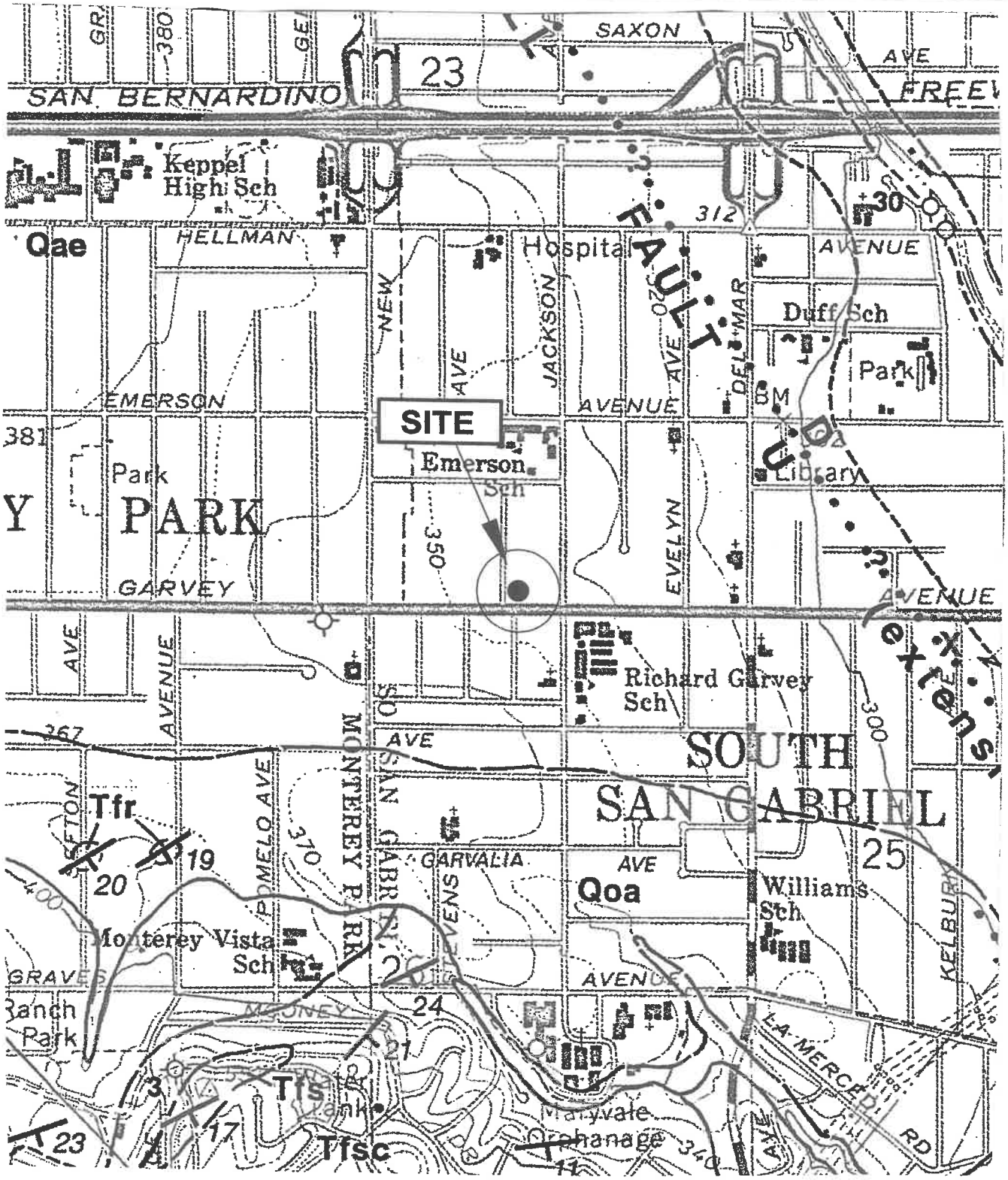
Based on the results of our subsurface investigation and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction. The following is a summary of the geotechnical design and construction factors that may affect the development of the site:

4.1 Seismicity

Our studies of regional and local seismicity indicate that there are no known active faults crossing the property. However, the site is located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is a characteristic of all Southern California communities.

4.2 Seismic Induced Hazards

Based on our review of the "Seismic Hazard Zones, El Monte Quadrangles" by California Department of Conservation, Division of Mines and Geology, it is concluded that the site is located outside the mapped potential liquefaction areas. It is our opinion that a liquefaction study is not required by the city for the subject site.



Note: Map modified from Geologic Map of the "El Monte Quadrangle" by Thomas W. Dibblee, Jr.

Approximate Scale: 1" = 1000'

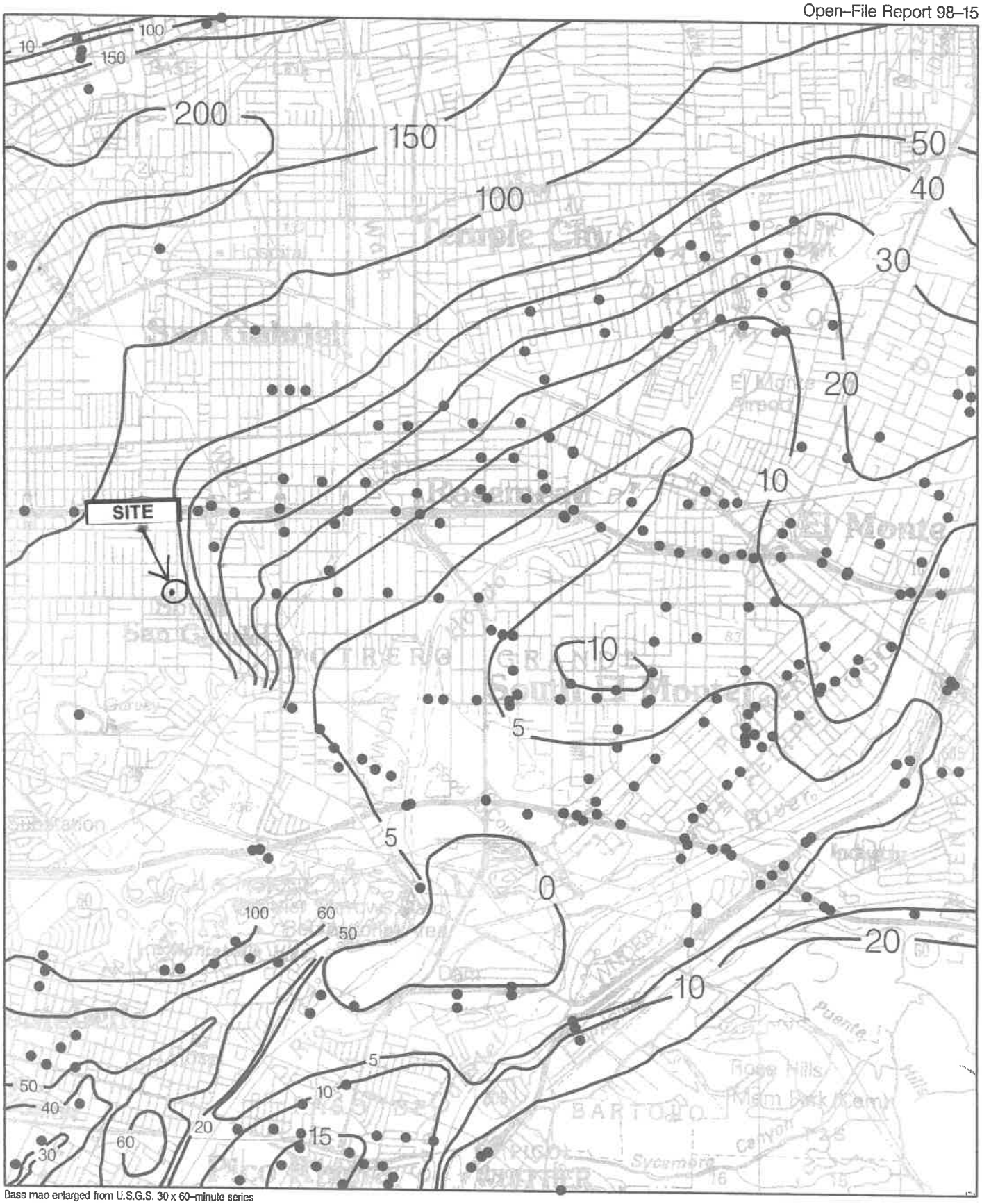
Qae: Older, Dissected Surficial Sediments: Slightly elevated and locally dissected alluvial gravel and sand at base of hill areas.

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY	Project Address: 7539 & 7545 Garvey Avenue Rosemead, California

REGIONAL GEOLOGY MAP

09/21

Figure 3



Base map enlarged from U.S.G.S. 30 x 60–minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, El Monte Quadrangle.

● Borehole Site

30 Depth to ground water in feet

ONE MILE

SCALE

4.3 Excavatability

Excavation of the subsurface materials should be able to be accomplished with conventional earthwork equipment.

4.4 Surficial Soil Removal and Recompaction

Based on our investigation, it is concluded that the existing surficial soils may not be suitable for structure support as they presently exist and will require remedial grading as discussed herein.

4.5 Groundwater

Static ground water levels were not encountered during our subsurface investigation to the maximum explored depth of 30 feet below the existing ground surface. Based on the historically high groundwater depth map prepared by CDMG Seismic Hazard Zone Report 024 the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (High Ground Water Map El Monte Quadrangle). Groundwater is therefore not expected to be a significant constraint during the construction. However, groundwater may be a significant constraint if grading is completed during the rainy season when perched water is more likely to occur.

5.0 RECOMMENDATIONS

Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

5.1 Grading

5.1.1 Site Preparation

Prior to initiating grading operations, any existing vegetation, trash, debris, over-sized materials (greater than 6 inches), and other deleterious materials within construction areas should be removed from the site.

5.1.2 Surficial Soil Removals

No detailed grading plan was available at the time of preparing this report however, based on our field exploration and laboratory data obtained to date, it is recommended that the surficial soils be removed to a depth of at least 5 feet below existing grade or 3 feet below the bottom of the footing, whichever is deeper. The recommended removal should be extended at least 5 feet

beyond the proposed building lines. Existing near surface soils should also be removed at least one foot within proposed concrete slab, driveway and parking areas. The construction areas should be excavated and then observed by a representative of this office to verify the soil conditions for any potential needs of removal of loose soils and replacement with compacted fill. This may also be necessary due to difference in expansion characteristics of foundation materials beneath a structure.

During the grading of the proposed slab areas if expansive material is encountered it should not be used for the top 12 inches but should be replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pad.

Locally deeper removals may be necessary to expose competent natural ground. The actual removal depths should be determined in the field as conditions are exposed. Visual inspection and/or testing may be used to define removal requirements.

5.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, then compacted in-place to minimum project standards.

5.1.4 Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. During the grading of the proposed slab area if expansive material is encountered it should not be used for the top 12 inches but should be replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pads. Fills should be placed in relatively thin lifts; brought to near optimum moisture content, then compacted to obtain at least 90 percent relative compaction based on laboratory standard ASTM D-1557-12.

5.1.5 ABC Slot Cuts

It is recommended that slot cuts must be used to support temporary excavations where the lateral support of the adjacent property or public right-of-ways is removed. Due to the closeness of the proposed excavation and the westerly, southerly and easterly property lines, it is our opinion that ABC slot cut must be used to support the vertical cut during grading of the proposed 5 feet excavation on the west, south and east sides of the property. The following presents our ABC Slot cut recommendations:

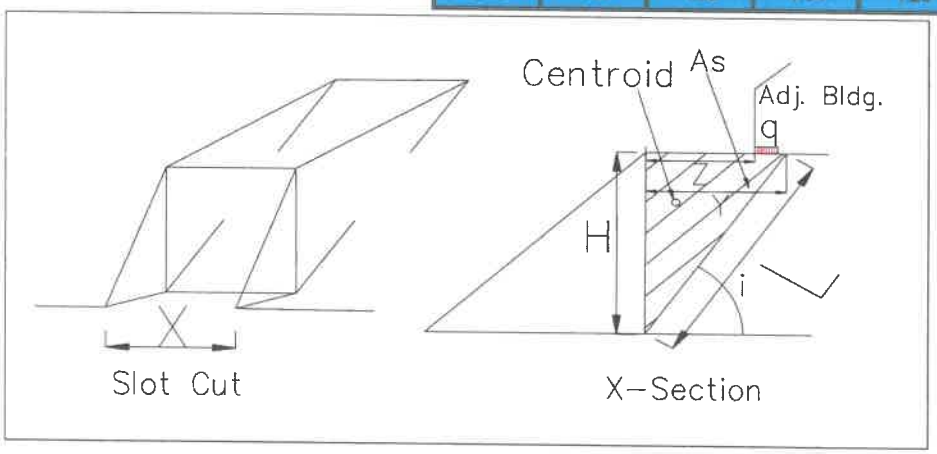
a. Excavate to over-excavation at side slopes no steeper than 1 to 1, horizontal to vertical,
b. Excavate in alternate slots, no wider than 8 feet (See Calculations, Figure 4).
c. Additional temporary shoring should be provided within the slot cuts. Shoring should be designed by structural engineer and capable of supporting 0.41 kips/ft where the adjacent building and/or property line is less than 5 feet away from the proposed excavation (See Figure 4 for details).
d. Once the excavations have been completed the bottom should be inspected and backfilled without delay.
e. All excavations should be made under the observation of the geotechnical engineer or his representative.
f. Care must be taken to prevent additional surcharge loads above un-shored cuts a horizontal distance from the top of the cut equal to the depth of the excavation.
g. Provisions for drainage should be implemented to prevent saturation of unshored excavations.
h. It is recommended that the excavations be inspected during construction by geotechnical engineer, so that necessary modifications can be made.

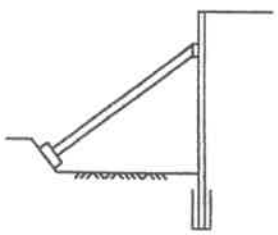
All trench excavations should conform to CAL-OSHA and local safety codes. All excavations should be made under the observation of the geotechnical engineer or his representative.

In as much as the proposed excavations may remove lateral support from the adjacent buildings a survey monitoring program or periodic inspection by project geotechnical consultant will be necessary to monitor potential movement in the excavation. In addition, the contractor should be solely responsible for safety during construction.

Slot Cut Calculation with Building Surcharge Load & Temporary Bracing

θ = Angle of influence (i) = 45 + ϕ/2 (Multiple provided)	30	45	50	59.5	75	degrees
H =Height of Slot Cut =	5	5	5	5	5	ft
L = Length of failure surface = H/sinθ =	10.0	7.1	6.5	5.8	5.2	ft
ϕ = Angle of internal friction =	29	29	29	29	29	degrees
C = Cohesion =	72	72	72	72	72	psf
γ = Unit weight of soil =	110	110	110	110	110	pcf
X = Width of slot cut =	8	8	8	8	8	ft
A = Area of failure = H^2/(2*tanθ) =	21.7	12.5	10.5	7.4	3.3	ft
D = Depth of Centroid = H/3 =	1.7	1.7	1.7	1.7	1.7	ft
Z = Distance to Adjacent Building =	0.0	0.0	0.0	0.0	0.0	ft
q = Adjacent Building Load =	500.0	500.0	500.0	500.0	500.0	psf
Depth of the failure wedge, Y = H/tan(θ)	8.7	5.0	4.2	2.9	1.3	ft
Adjacent footing within the failure wedge? 1=Yes, 0=No	1	1	1	1	1	
Q = Surcharge on Failure Wedge =qx1/1000 =	0.5	0.5	0.5	0.5	0.5	kips/ft
W = Weight+Q = γ*(A/1000)+Q =	2.9	1.9	1.7	1.3	0.9	kips/ft
F_T = Tangent force = Wsinθ =	1.4	1.3	1.3	1.1	0.8	kips/ft
F_N = Normal force = Wcosθ =	2.5	1.3	1.1	0.7	0.2	kips/ft
R = Resistance force along failure plane = F_N*tanϕ + L(C/1000) =	2.1	1.2	1.1	0.8	0.5	kips/ft
Lateral Resistance from Bracing, R_L =	0.41	0.41	0.41	0.41	0.41	kips/ft
Forces along sides						
Area (A_S)=	21.7	12.5	10.5	7.4	3.3	ft^2
Average intergranular stress, τ = C + γ*Dtanϕ =	173.6	173.6	173.6	173.6	173.6	psf
Resistance force along sides of wedge = R_S = τ*2(A_S/1000) =	7.5	4.3	3.6	2.6	1.2	kips
F.S. = (R*X + R_S + R_L*X) / F_T*X =	2.40	1.66	1.52	1.34	1.25	





Bracing within Slot Cuts

Site: 7539 & 7545 Garvey Avenue, Rosemead
EGL Project No.: 21-AA-106

Provide bracing within the slot cuts for additional support. Bracing should be designed by structural engineer and capable of supporting 0.41 kips/ft where the adjacent building & property line is approximately less than 1 foot away from the proposed excavation.

Figure 4

5.2 Shallow Foundation Design

5.2.1 Bearing Value

For the proposed mixed-use builings, an allowable bearing value of 1800 pounds per square foot (psf) may be used for design of the footings placed at a depth of at least 18 inches below the lowest adjacent ground and founded on the new certified compacted fill. Single spread footings should be at least 24 inches square and continuous footings should be at least 12 inches wide. These bearing values may be increased by 200 psf for each additional foot of depth or width to a maximum value of 4000 psf. The above recommended value may be increased by one third (1/3) when considering short duration seismic or wind loads.

5.2.2 Settlement

Settlement of the footings placed as recommended and subject to no more than allowable loads is not expected to exceed 3/4 inch. Differential settlement between adjacent columns is not anticipated to exceed 1/4 inch for a span of 30 feet or less.

5.2.3 Lateral Pressures

Passive earth pressure may be computed as an equivalent fluid pressure of 300 pounds per cubic foot, with a maximum earth pressure of 2500 pounds per square foot. An allowable coefficient of friction between soil and concrete of 0.35 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one third (1/3).

Active earth pressure from horizontal backfill may be computed as an equivalent fluid weighting of 35 pounds per cubic foot. The above value assumes free-draining conditions.

5.3 Foundation Construction

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. The following presents our recommendations for the foundation construction. All footings should be founded at a minimum depth of 18 inches below the lowest adjacent ground surface and founded into new certified compacted fill. Proposed footings should include surcharge from adjacent neighboring structures, including structural footings and/or walls. All continuous footings should have at least two No. 4 reinforcing bar placed both at the top and two No. 4 reinforcing bar placed at the bottom of the footings. A grade beam of at least 12 inches square, reinforced as recommended above for footings, should be utilized across the

garage entrance. Base of the reinforced beam should be at the same elevation as the bottom of the adjoining footings.

5.4 Concrete Slab

Concrete slabs should be designed by the structural engineer using an expansion index of 16 and an effective plasticity index of 10. Concrete slabs should be a minimum of 4 inches thick, underlain with 2 inches of sand and reinforced with a minimum of #3 rebar spaced at 24" on center each way, or its equivalent. All slab reinforcement should be supported to ensure proper positioning during placement of concrete. A positive separation should be maintained with expansive joint material to permit relative movement. Concrete slabs in moisture sensitive areas should be underlain with a vapor barrier consisting of a minimum of six-mil polyethylene membrane with all laps sealed. A minimum of two inches of sand should be placed over the membrane to aid in uniform curing of concrete.

5.5 Retaining Wall

Wall should be provided with subdrains to reduce the potential for the buildup of hydrostatic pressure. Backdrains could consist of free drainage materials (SE of 30 or greater) or CalTrans Class 2 permeable materials immediately behind the wall and extending to within 18 inches of the ground surface. A 4-inch diameter perforated pipe wrapped in gravel and geofabric should be installed at the base of the wall and sloped to discharge to a suitable collection facility or through weep holes. Alternatively, commercially available drainage fabric could be used. The fabric manufacturer's recommendations should be followed in the installation of the drainage fabric backdrain.

5.6 Temporary Excavation and Backfill of Utility Trenches

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-12. All temporary excavations should be observed by a field engineer of this office so as to evaluate the suitability of the excavation to the exposed soil conditions.

6.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in Southern California, which is a tectonically active area. The following CBC 2019 (Chapter 16) & ASCE 7-16 seismic related values may be used:

Site Classification: (ASCE, Table 20.3-1)	D
Spectral Response Accelerations (g):	
(CBC, Figure 1613.2.1 (1) 0.2-Second, S_S	1.965
(CBC, Figure 1613.2.1 (2)) 1-Second, S_1	0.708
Site Coefficient:	
(CBC, Table 1613.2.3 (1)) F_a	1.0
(CBC, Table 1613.2.3 (2)) F_v	1.7

Based on the U.S. Seismic Design Maps (USGS, updated January 2019), the proposed structures may be designed to accommodate up to a maximum site horizontal acceleration of 0.935g with 2% probability of being exceeded in 50 years. However, the Project Structural Engineer should be aware of the information provided to determine if any additional structural strengthening is warranted.

7.0 TEMPORARY TRENCH EXCAVATION AND BACKFILL

All trench excavations should conform to CAL-OSHA and local safety codes. Based on our field investigation we believe some caving may occur in trenches. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-12.

8.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during EGL's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate in the soils. The test results are presented in the Appendix B.

According to ACI 318-14 Table 19.3.1.1, a sulfate content of 0.006 percent by weight in soils is assigned to Class "S0" and the severity of exposure to sulfate for concrete placed in contact with the onsite soil is considered "Not Applicable". Based on the testing results and ACI 318-14 Table 19.3.2.1, it is concluded that there is no restriction on the type of cement ("No Type Restriction") to be used at the site; however EGL recommends that Type II cement be used.

Based on the minimum resistivity test results, the subsurface soils are moderately corrosive to buried metal pipe. Any underground steel utilities should be blasted and given protective

coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

9.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction.
- Utility trench backfill.
- Foundation excavation.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

10.0 111 STATEMENT

Based on our field investigation and the laboratory testing results, it is our opinion that the grading and proposed structures will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations are followed.

11.0 PERCOLATION TEST

Building pads should be properly drained toward the street away from the slope and structure via swales or area drains. Positive pad drainage shall be incorporated into the final plans. In no cases should water be allowed to pond within the site, impound against structures or flow in a concentrated and/or uncontrolled manner down the descending slope areas.

In order to evaluate the feasibility of the infiltration system, EGL has performed percolation tests at the subject site based on the County of Los Angeles Department of Public Works of "*Guidelines for Geotechnical Investigation and Reporting; Low Impact Development Stormwater Infiltration*" (GS200.2, 2017). The test was performed within test boring B-1. Approximate location of the test boring is shown on the Site Plan, Figure 2. The test boring was filled with a depth of minimum 12 inches water two consecutive times for the presoak prior to filling for the

percolation test on September 8, 2021 and the water only drained 2.75" and 0.13" in 30 minutes, respectively. Due to the hard clayey material at the site and the slow percolation the testing was stopped. It is EGL's opinion that the infiltration rate of water within the very stiff to hard clayey soil is expected to be less than 0.3 inch/hour. An infiltration/detention basin within the natural soil is not feasible due to the fine-grained clayey material. An infiltration system using planter boxes or approved equivalent may be used. If planter boxes are used, they should be waterproofed and designed with an overflow to the street.

12.0 DRAINAGE

Building pad should be properly drained toward the street away from the slope and structure via swales or area drains. Positive pad drainage shall be incorporated into the final plans. In no cases should water be allowed to pond within the site, impound against structures or flow in a concentrated and/or uncontrolled manner down the descending slope areas.

13.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics between locations of the exploratory locations. If conditions are encountered during construction which appear to be different from those disclosed by the exploratory work, this office shall be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

REFERENCES

1. American Concrete Institute, (2014), "*Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary*", Chapter 19: Durability Requirements, Sections 19.3.1: Exposure Categories and Classes & 19.3.2: Requirements for Concrete Mixtures; pages 317 to 323, Tables 19.3.1.1 and 19.3.2.1".
2. ASCE, (2017), "ASCE/SEI 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures; dated 05-31-2017, 889 pages; prepared and published by American Society of Civil Engineers.
3. CBC, (2019), "California Building Code: California Code of Regulations, Title 24, Part 2, Volume 2 of 2, California Building Standards Commission"; Section 1613 Earthquake Loads; pages 33-46.
4. CDMG, (1998), "Seismic Hazard Evaluation of the El Monte 7.5-minute Quadrangle, Los Angeles County, California"; updated 2005; prepared by California Division of Mines and Geology; Seismic Hazard Zone Report 024; 59 pgs, 6 figs, 4 tables and 3 plates.
5. CDMG, (1999), "Seismic Hazard Zones of El Monte 7.5-minute Quadrangle, Los Angeles County, California"; prepared by California Division of Mines and Geology; Official Map; scale 1" = 2000'
6. Dibblee, Jr., Thomas W., (1999), "Geological Map of the El Monte and Baldwin Park Quadrangles, Los Angeles County, California"; published by Dibblee Geological Foundation; DF-69, Scale 1" = 2000'
7. Los Angeles County, (2017), "Guidelines For Geotechnical, Investigation, And Reporting Low Impact Development Stormwater Infiltration"; dated 06-30-2017; Administrative Manual GS200.2, prepared by County of Los Angeles Department of Public Works, Geotechnical and Materials Engineering Division, 40 pages; http://ladpw.org/gmed/permits/docs/policies/GS200.2.pdf
8. Scales Lab Architects (2021), "Site Plan, Proposed Villa Mixed-Use, 7539 Garvey Avenue, Rosemead, California", Scale: 3/32" =1', Sheet A-101, dated June 1, 2021.
9. USGS, (2019), "US Seismic Design Maps"; updated 01-2019; prepared by United States Geological Survey; https://earthquake.usgs.gov/ws/designmaps/asce7-16.html
10. Yeats, Robert S., (2004) "Tectonics of the San Gabriel Basin and Surroundings, Southern California"; GSA Bulletin; September/October 2004; v.116; no. 9/10; p. 1158-1182

APPENDIX A
FIELD INVESTIGATION

Our field exploration was performed at the subject property September 8, 2021 with the aid of a hollow-stem drill rig of ACE Drilling Services. A total of five (5) 8-inch diameter hollow-stem auger borings were drilled to a maximum depth of 30.0 feet below the existing ground surface. Upon completion of drilling and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. The purpose of the excavation was to investigate the engineering characteristics of the onsite soils with respect to the proposed development.

The borings were supervised and logged by EGL's engineer. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. The approximate locations of these borings are shown on the Site Plan (Figure 2). Ring samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

EGL

BORING LOG: B-1

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0							
2		R	32	CL/ML	93.5	4.0	@ 2.0' Sandy silty clay with sandy clayey silt, olive brown, dry, very stiff
4							
		R	50	CL	105.7	7.7	@ 5.0' Sandy clay, dark yellowish brown, dry to slightly moist, hard
6							
		R	50	CL	102.4	17.1	@ 7.0' Silty clay, olive yellow, moist, hard
8							
10							Total Depth = 8.0 feet
12							No Caving; No Groundwater
							Boring Backfilled and Tamped After Percolation Test
14							Hammer Driving Weight = 140 lbs.
16							Hammer Driving Height = 30 inches
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							

EGL

BORING LOG: B-2

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0							
2		R	32	CL	105.8	5.4	@ 2.0' Sandy clay, olive brown to dark yellowish brown, dry, very stiff
4							
6		R	50/11"	CL	109.5	9.7	@ 5.0' Sandy clay, dark yellowish brown, slightly moist, hard
8							
10		R	33	CL	106.4	16.0	@ 10.0' Sandy clay, dark yellowish brown, slightly moist to moist, very stiff
12							
14							
16		R	30	CL	98.4	18.9	@ 15.0' Sandy clay, olive brown, moist, very stiff
18							
20		R	41	CL	91.4	21.9	@ 20.0' Silty clay, olive gray, moist to very moist, very stiff
22							
24							Total Depth = 20.0 feet No Caving; No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							

EGL

BORING LOG: B-3

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0							
2		R	50/11"	CL/ML	102.7	6.7	@ 2.0' Sandy silty clay with sandy clayey silt, dark yellowish brown, dry to slightly moist, hard
4							
6		R	37	CL/ML	99.9	4.7	@ 5.0' Sandy silty clay with sandy clayey silt, dark yellowish brown, dry, very stiff
8							
10		R	50	CL	96.4	19.0	@ 10.0' Sandy clay, olive brown, moist, hard
12							
14							
16		R	60/6"	CL	98.9	10.3	@ 15.0' Sandy clay, olive brown, slightly moist, hard
18							Refusal @ 16.0 feet Total Depth = 16.0 feet
20							No Caving; No Groundwater Boring Backfilled and Tamped
22							
24							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							

EGL

BORING LOG: B-4

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0							
2		R	50/10"	SC	106.6	5.3	@ 2.0' Clayey sand, fine to coarse grained, olive brown, slightly moist, very dense, few gravel up to 2.0" in size
4							
6		R	15	SC	108.0	6.9	@ 5.0' Clayey sand, fine to coarse grained, dark yellowish brown, slightly moist, medium dense, few fine gravel
8							
10		R	35	CL	109.3	13.4	@ 10.0' Sandy clay, dark yellowish brown, slightly moist, very stiff
12							
14							
16		R	35	CL	96.8	22.1	@ 15.0' Sandy clay, olive brown, very moist, very stiff
18							
20		R	30	CL	92.7	19.2	@ 20.0' Silty clay, olive gray, moist to very moist, very stiff
22							
24							Total Depth = 20.0 feet No Caving; No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							

EGL

BORING LOG: B-5

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Earth Material Descriptions
0							
2	B	R	20	ML	106.6	13.1	@ 2.0' Sandy clayey silt, dark yellowish brown, slightly moist to moist, stiff
4							
6		R	25	CL	118.8	12.7	@ 5.0' Sandy clay, dark, brown, slightly moist, stiff
8							
10		R	25	CL	117.3	13.0	@ 10.0' Sandy clay, dark yellowish brown, slightly moist, stiff
12							
14							
16		R	23	CL	108.2	17.8	@ 15.0' Sandy clay, dark yellowish brown, moist, stiff
18							
20		R	30	CL	99.3	23.1	@ 20.0' Sandy clay, dark yellowish brown, very moist, very stiff
22							
24							
26		R	27	CL	97.3	15.8	@ 25.0' Sandy clay, dark yellowish brown, slightly moist, stiff
28							
30		R	36	CL	90.9	24.6	@ 30.0' Sandy clay, dark yellowish brown, very moist, very stiff
32							
34							Total Depth = 30.0 feet No Caving; No Groundwater Boring Backfilled and Tamped After Groundwater Observation
36							
38							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
40							
42							
44							
46							

APPENDIX B

LABORATORY TESTING

During the subsurface exploration, EGL personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.025 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Consolidation Tests

Consolidation tests were performed on selected undisturbed soil samples in accordance with ASTM D2435 standard. The consolidation apparatus is designed for a one-inch high soil filled brass ring. Loads are applied in several increments in a geometric progression and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. The samples were inundated with water at a load of one kilo-pounds (kips) per square foot, and the test results are shown on the attached Figures.

Corrosion Test

Corrosion series of bulk sample was tested in accordance with Caltrans test methods. The series consist of Chloride Content, Sulfate Content, pH, and Minimum Resistivity tests. The methods used and test results are as follows:

Sample Location	pH	CT-412 Chloride (ppm)	CT-417 Sulfate (% by weight)	CT-643 Min. Resistivity (ohm-cm)
B-5 @ 0-5'	6.86	350	0.006	3,900

Expansion Index

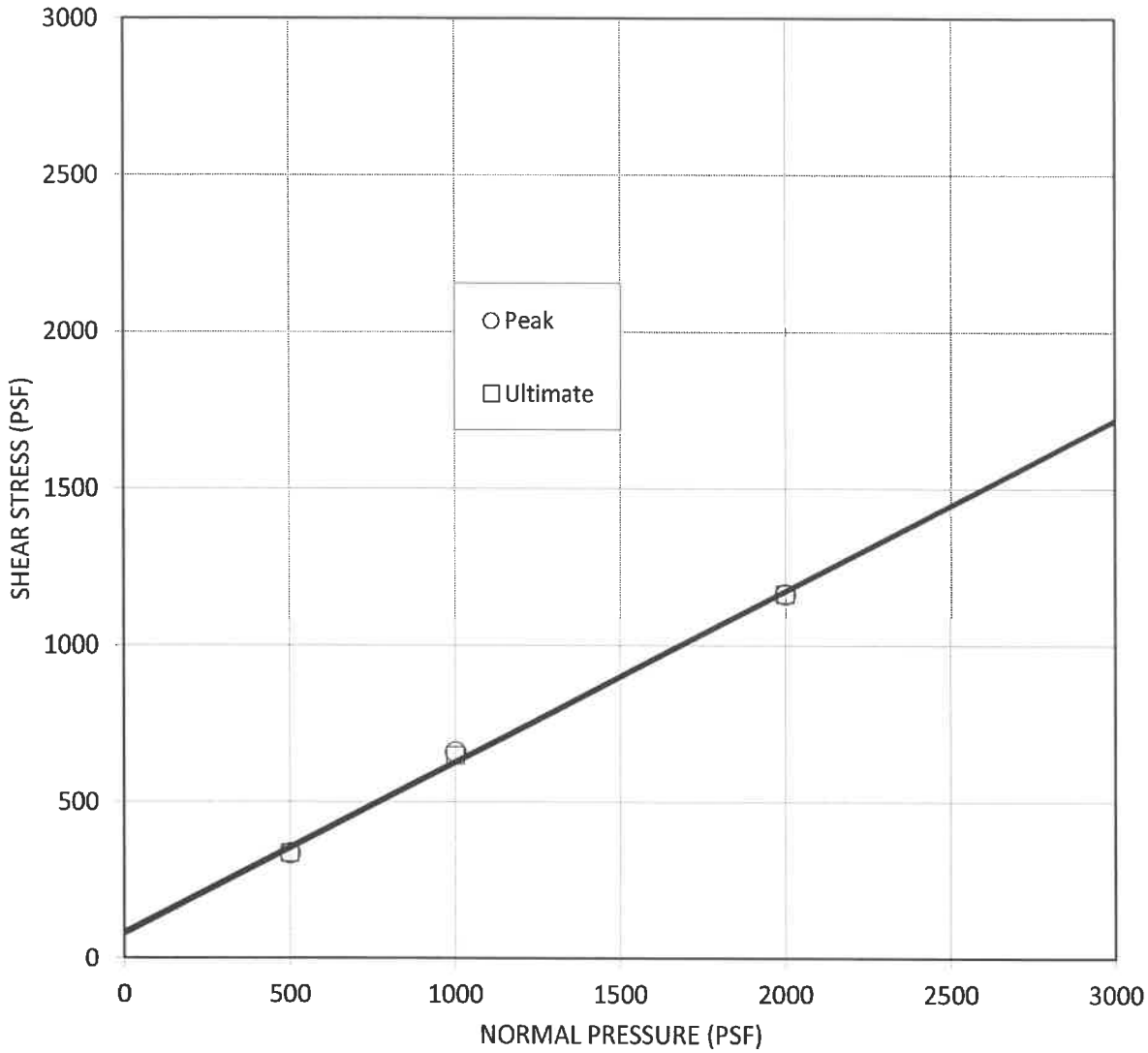
The Expansion Index was determined for the typical site material encountered in the borings. The laboratory standard used was ASTM D4829-95 and the test results are as follows:

Sample Location	Expansion Index	UBC Classification
B-5 @ 0-5'	16	Very Low

Atterberg Limits

The Atterberg Limits was determined for the typical site material encountered in the borings. The laboratory standard used was ASTM D4318 and the test results are as follows:

Sample Location	Liquid Limit	Plastic Limit	Plastic Index
B-2 @ 2'	20	14	6
B-2 @ 5'	24	14	10
B-5 @ 10'	28	17	11



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-1	1	2.0	Ring	CL/ML	○	84	29
					□	78	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	4.0	29.5	92.6	97.1
1000	4.0	29.5	93.4	99.1
2000	4.0	29.0	94.4	99.8

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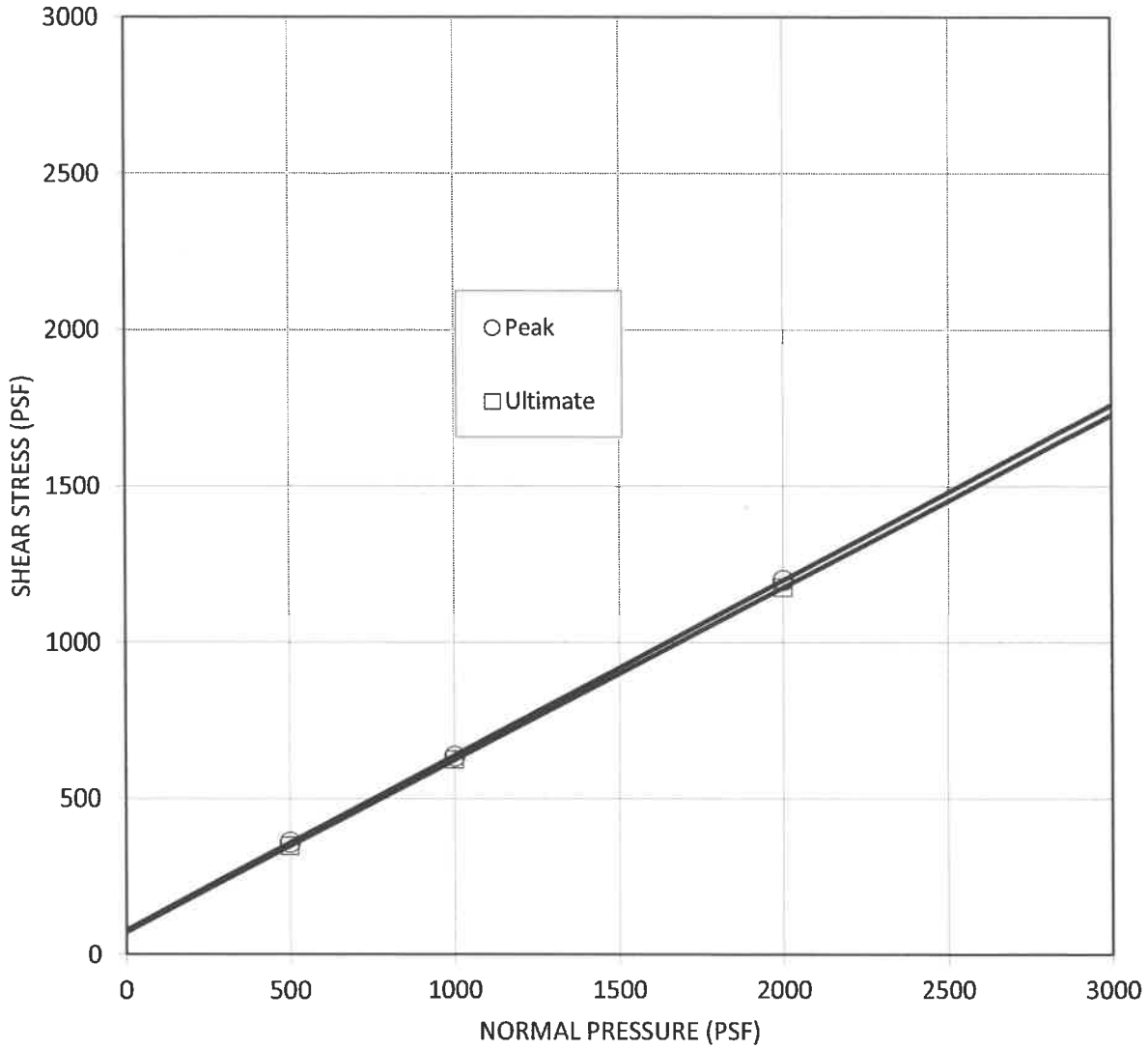
DIRECT SHEAR

09/21 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-3	2	5.0	Ring	CL/ML	○	78	29
					□	72	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	4.7	25.6	98.5	97.4
1000	4.7	24.6	100.5	98.1
2000	4.7	24.1	101.5	98.7

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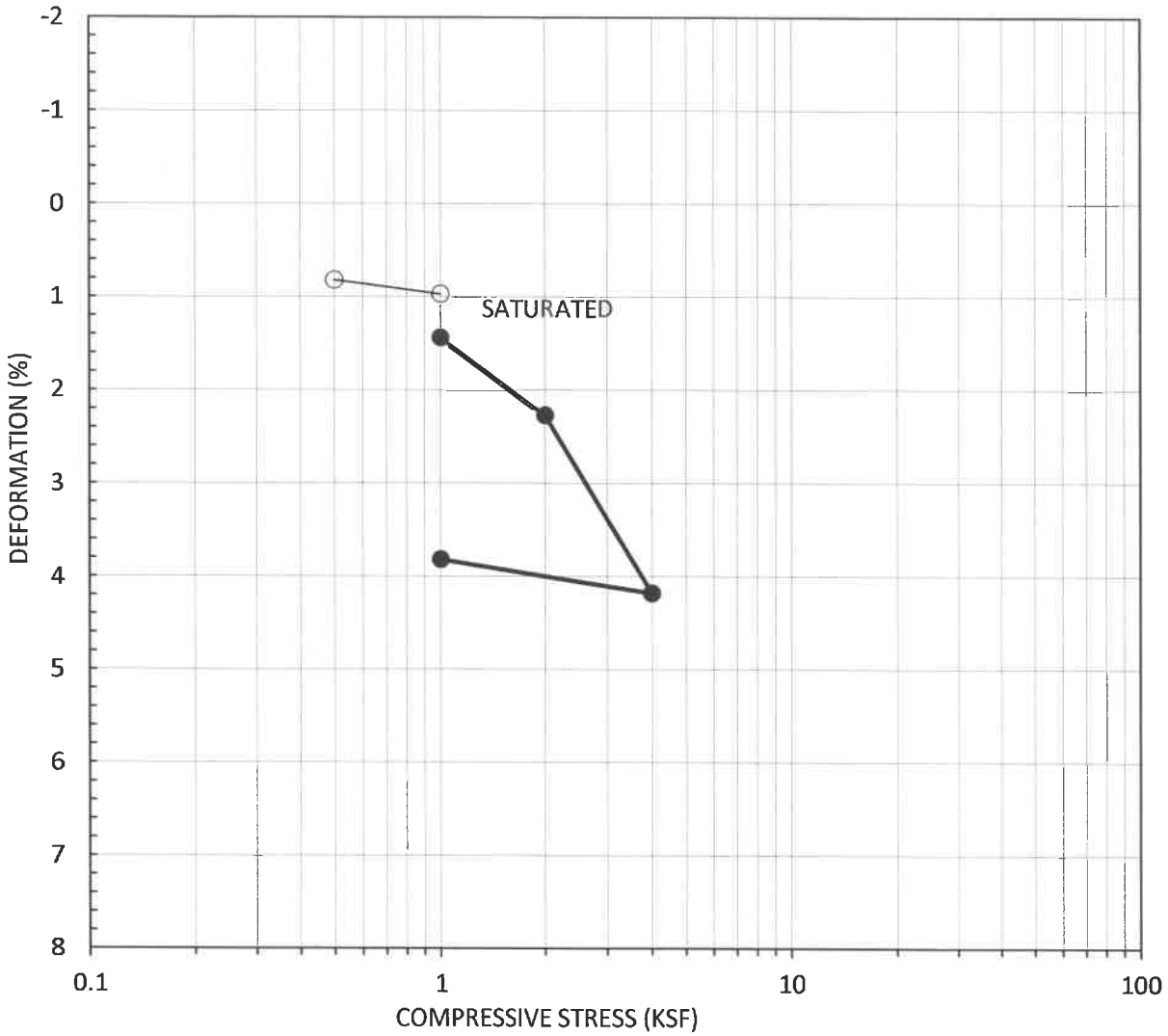
DIRECT SHEAR

09/21 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-2	2	5.0	CL	9.7	110.1	0.530

ENVIRONMENTAL
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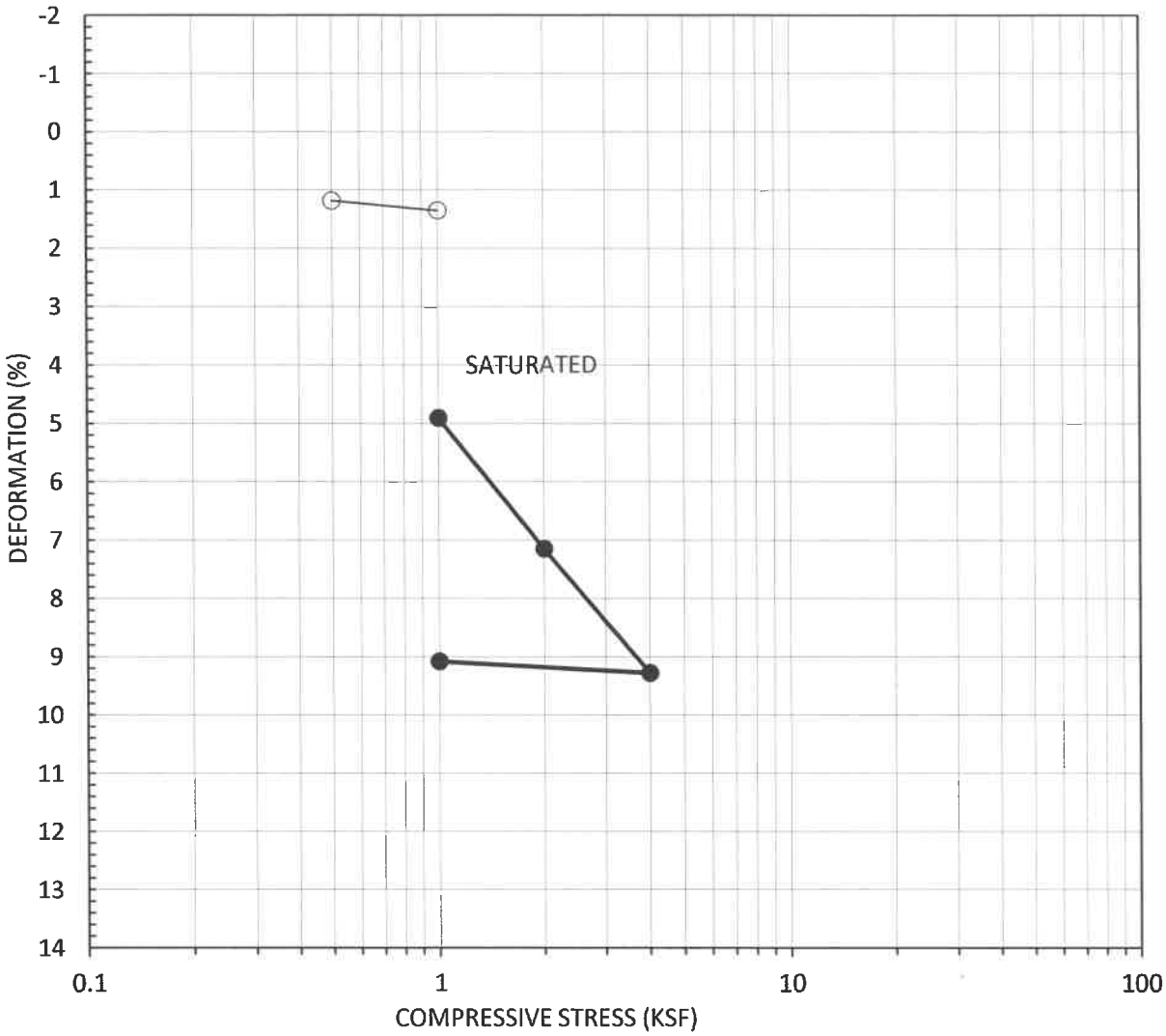
Rosemead, California

CONSOLIDATION

09/21 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-4	2	5.0	SC	6.9	109.2	0.543

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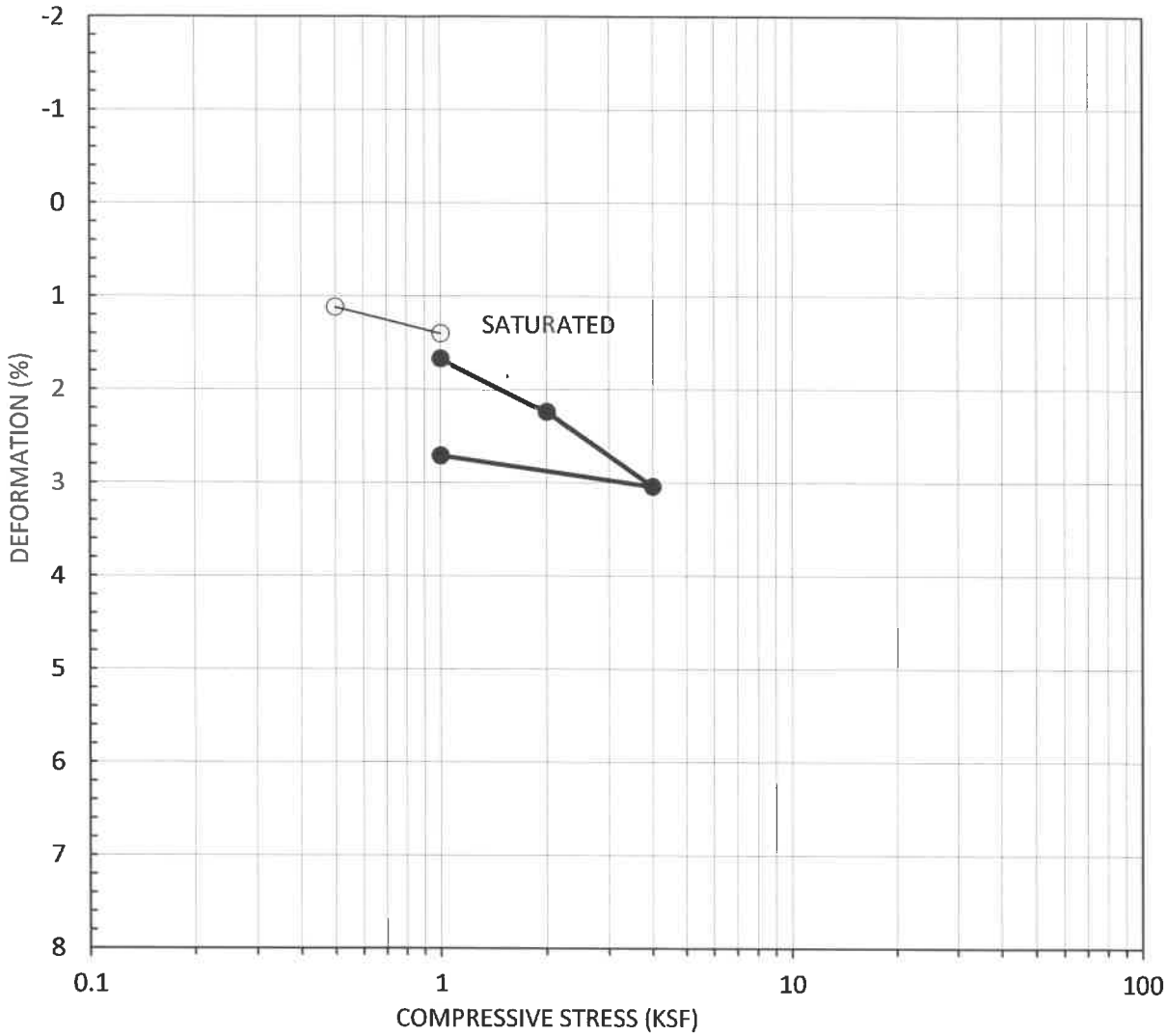
CONSOLIDATION

09/21 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-5	1	2.0	ML	13.1	107.0	0.575

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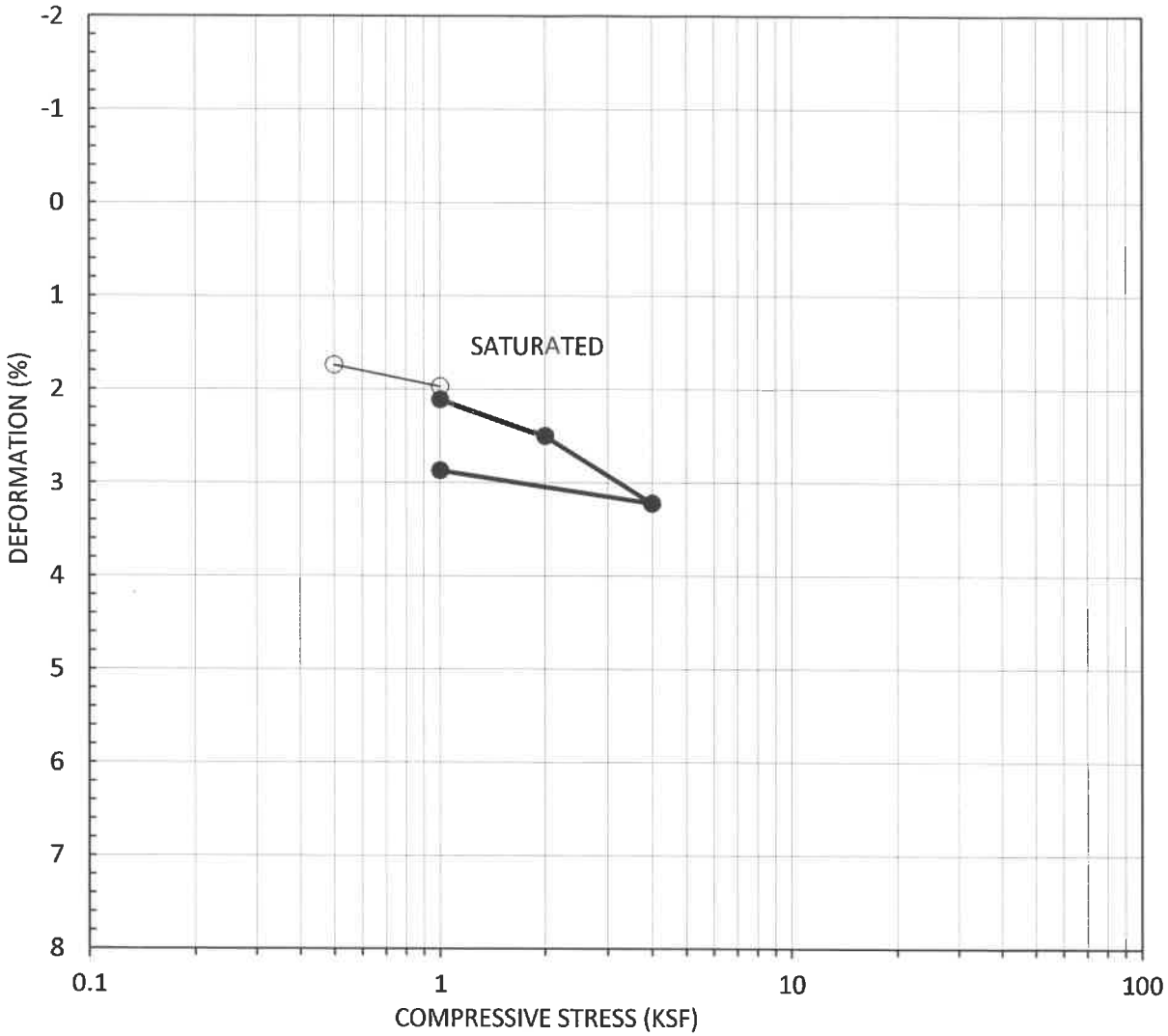
CONSOLIDATION

09/21 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-5	3	10.0	CL	13.0	117.7	0.431

ENVIRONMENTAL
GEOTECHNOLOGY
LABORATORY

Project Address:
7539 & 7545 Garvey Avenue
Rosemead, California

CONSOLIDATION

09/21 (ASTM D2435) Figure

Attachment C

Master Covenant Agreement (MCA)

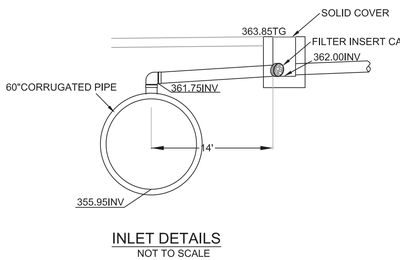
This section will provide in Final Report

Attachment D

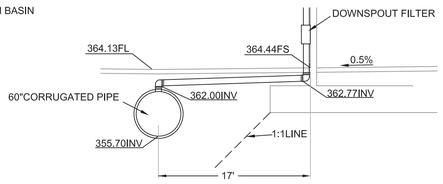
Operations and Maintenance (O&M) Plan

This section will provide in Final Report

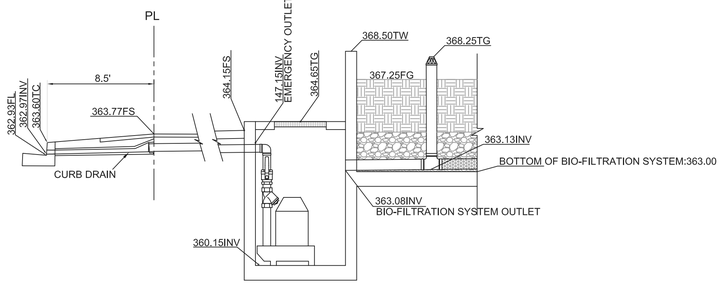
PRELIMINARY LOW IMPACT DEVELOPMENT PLAN



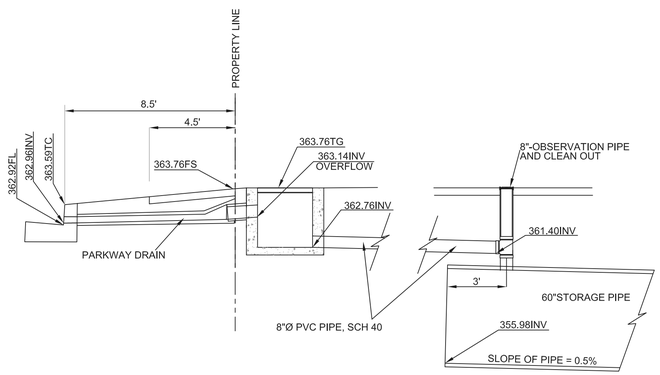
INLET DETAILS
NOT TO SCALE



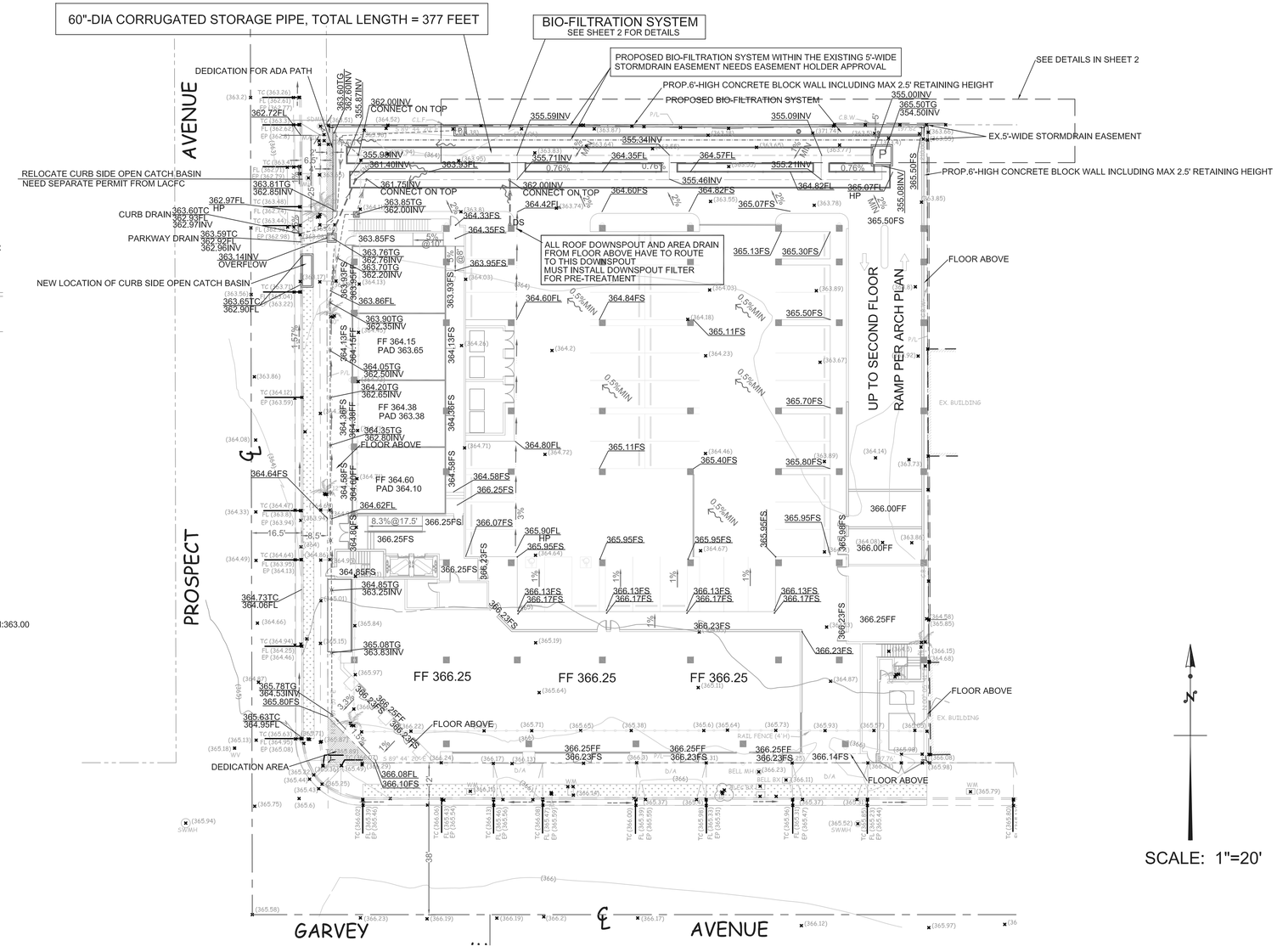
INLET DETAILS
NOT TO SCALE



OUTFLOW (FROM BIO-FILTRATION SYSTEM) CONNECTION DETAILS
NOT TO SCALE



OVERFLOW CONNECTION DETAILS
NOT TO SCALE



ABBREVIATIONS:

AC	Asphalt Concrete
C/B	Catch Basin
CBW	Concrete Block Wall
CL	Center Line
CLF	Chain Link Fence
CONC.	Concrete
D/A	Driveway Appron
EP	Edison Pole
EX.	Existing
FF	Finished Floor Elevation
FG	Finished Grade
FH	Fire Hydrant
FL	Flow Line Elevation
FS	Finished Surface
GV	Gas Valve
HP	High Point
INV.	Invert Elevation
MIN.	Minimum
NTS	Not To Scale
PCC	Portland Cement Concrete
P/L	Property Boundary Line
PM	Parking Meter
PVMT.	Pavement
RW	Retaining Wall
SMH	Sewer Manhole
S/W	Sidewalk
STA	Station
STD	Standard
SHT	Sheet
TBR	To Be Removed
TC	Top of Curb Elevation
TG	Top of Grate Elevation
TW	Top of Wall Elevation
Hr	Retaining Height
Hv	Height of Retaining Wall
WF	Wooden Fence
WM	Water Meter

LEGEND:

(100.25)	Existing Elevation
101	Ex. Ground Contour Line
	Chain Linked Fence
	Ex. Structure
	Street Light
S	Sewer Line
W	Water Line
10"	Ex. Tree, Diameter
DS	Downspout
	Prop. Flow Line for Swale
	Prop. Sheet Flow
	Ex. Flow
	Area Drain
	Overflow Drain
	Catch basin
	Landscape Area

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREON ARE BASED ON N 00° 07' 57" E OF THE CENTERLINE OF PROSPECT AVENUE, AS SHOWN IN PARCEL MAP NO. 17240, P.M.B. 195-11-12.

LEGAL DESCRIPTION:

BEING A SURVEY OF A PORTION OF LOT 8 IN BLOCK 2 OF SUBDIVISION OF THE GARVEY RANCH, IN THE CITY OF ROSEMEAD, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 52, PAGES 43 AND 44 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

COUNTY OF LOS ANGELES BENCHMARK

B.M. REFERENCE	LY11541
ELEVATION	335.84
DESCRIPTION	LACO BM TAG IN S CB 3.3FT E/O BCR @ SE COR EMERSON PL & ISABEL AVE

TRITECH ENGINEERING ASSOCIATES

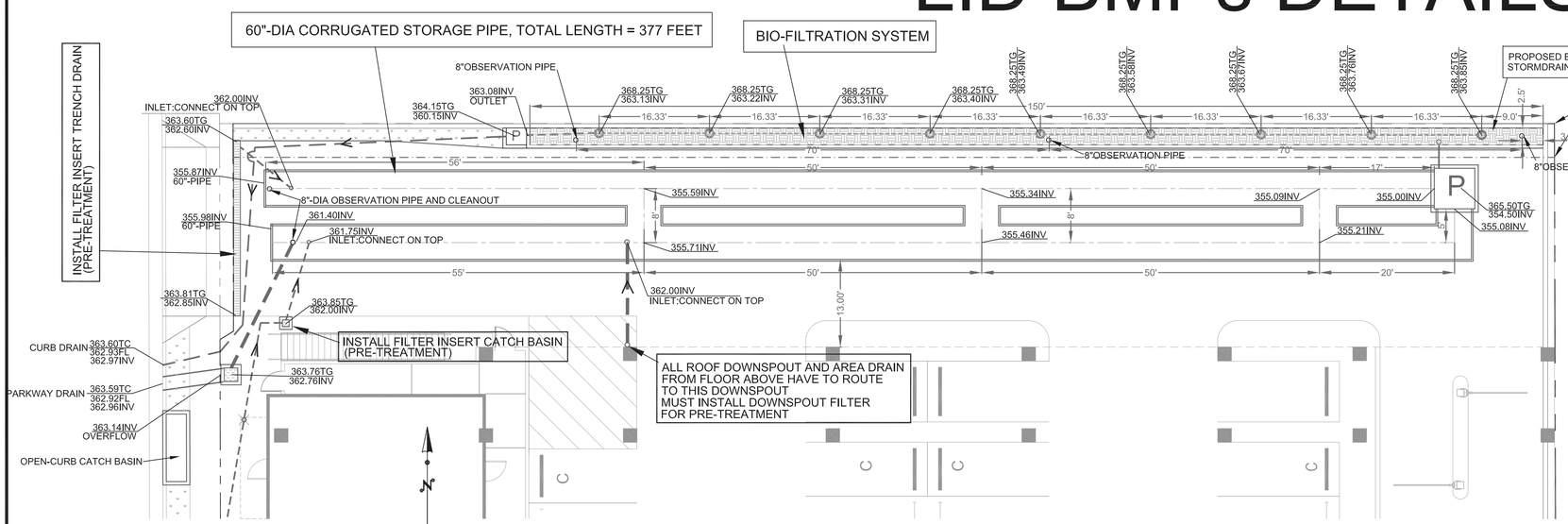
SUBDIVISION
LAND SURVEY
CIVIL ENGINEERING
& DESIGN

135 N. SAN GABRIEL BLVD.
SAN GABRIEL, CA 91775
TEL: (626) 570-1918
EMAIL: Info@tritechengineer.com

PRELIMINARY
LOW IMPACT DEVELOPMENT PLAN

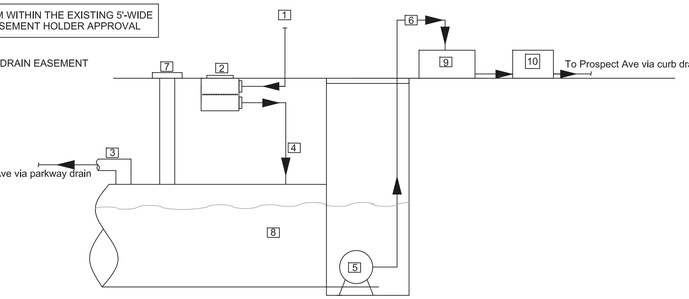
SCALE: 1"=20'	APN# : 5286-022-010, 009	DRAWN BY: SMITH
DATE: 11/24/2021		REVISED:
7539 GARVEY AVE ROSEMEAD, CA 91770		
SHEET 1 OF 2		JOB NO. 210515

LID BMPs DETAILS



PLAN

SCALE: 1"=10'



1 Rainwater collection point (Catch Basins, Area Drains, Roof Downspouts)

2 Downspout Filter, Filter Insert Catch Basin, or Filter Insert Trench Drain (Pre-Treatment) - will provide calculation in Final Design

3 Overflow runoff to Prospect Ave via parkway drain

4 Stormwater inlet to 60"-Storage Pipe

5 PUMP SYSTEM (Flow Rate not more than 9.74 GPM) - will provide calculation in Final Design

6 Pressurized water outlet to Biofiltration System

7 Stormdrain Cleanout and Observation Pipe

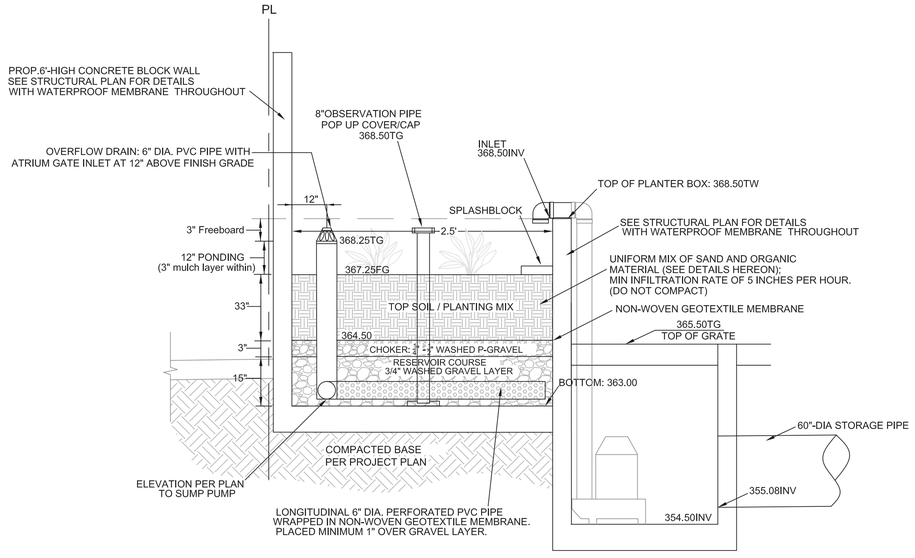
8 377 feet of 60"-Corrugated Pipe (Storage Pipe)

9 BIO-FILTRATION SYSTEM

10 PUMP SYSTEM for outflow from Bio-filtration System - will provide calculation in Final Design

STORMWATER FLOW DIAGRAM(TYP.)

NOT TO SCALE



SECTION(TYP.)

NOT TO SCALE

BIO-FILTRATION SPECIFICATION

Underdrain

Biofiltration areas require an underdrain to collect and discharge stormwater runoff that has been filtered through the soil media, but not infiltrated, to another stormwater quality control measure, storm drain system, or receiving water. The underdrain must have a mainline diameter of eight inches using slotted PVC SDR 26 or PVC C9000. Slotted PVC allows for pressure water cleaning and root cutting, if necessary. The slotted pipe should have two to four rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches wide with a length of 1 to 1.25 inches. Slots should be longitudinally-spaced such that the pipe has a minimum of one square inch opening per lineal foot and should face down.

The underdrain should be placed in a gravel envelope (Class 2 Permeable Material per Caltrans Spec. 68-1.025) that measures three feet wide and six inches deep. The underdrain is elevated from the bottom of the biofiltration area by six inches within the gravel envelope to create a fluctuating anaerobic/aerobic zone below the underdrain to facilitate denitrification within the anaerobic/anoxic zone and reduce nutrient concentrations. The top and sides of the underdrain pipe should be covered with gravel to a minimum depth of 12 inches. The underdrain and gravel envelope should be covered with a geomembrane liner to prevent clogging. The following aggregate should be used for the gravel envelope:

Particle Size (ASTM D422)	%Passing by Weight
¾ inch	100%
¼ inch	30-60%
#8	20-50%
#50	3-12%
#200	0-1%

Underdrains should be sloped at a minimum of 0.5 percent and must drain freely to an approved discharge point.

Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain to provide a clean-out port as well as an observation well to monitor drainage rates. The wells/clean-outs should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/clean-outs should extend six inches above the top elevation of the biofiltration area mulch, and should be capped with a lockable screw cap. The ends of underdrain pipes not terminating in an observation well/clean-out should also be capped.

Hydraulic Restriction Layer

Lateral infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent waterproofing, may be placed along the vertical walls to reduce lateral flows. This geomembrane liner must have a minimum thickness of 30 mils and meet the requirements of Table E-12. Generally, waterproof barriers should not be placed on the bottom of the biofiltration unit, as this would prevent incidental infiltration which is important to meeting the required pollutant load reduction.

Table E-12. Geomembrane Liner Specifications for Biofiltration Areas

Parameter	Test Method	Specifications
Material		Nonwoven geomembrane liner
Unit weight		8 oz/yd^2 (minimum)
Filtration rate		0.08 in/sec (minimum)
Puncture strength	ASTM D-751 (Modified)	125 lbs (minimum)
Mullen burst strength	ASTM D-751	400 lb/in2 (minimum)
Tensile strength	AST D-1682	300 lbs (minimum)
Equiv. opening size	US Standard Sieve	No. 80 (minimum)

Planting / Storage Media

* The planting media placed in the biofiltration area should achieve a long-term, in-place infiltration rate of at least 5 in/hr. Higher infiltration rates of up to 12 in/hr are permissible. The biofiltration soil media must retain sufficient moisture to support vigorous plant growth.
* The planting media mix must consist of 60 to 80 percent sand and 20 to 40 percent compost.
* Sand should be free of wood, waste, coatings such as clay, stone dust, carbonate, or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for biofiltration should be analyzed by an accredited laboratory using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D422 or as approved by the local permitting authority) and meet the following gradations (Note: all sand complying with ASTM C33 for fine aggregate comply with the gradation requirements listed below):

Particle Size (ASTM D422)	%Passing by Weight
3/8 inch	100%
#4	90-100%
#8	70-100%
#16	40-95%
#30	15-70%
#40	5-55%
#110	0-15%
#200	0-5%

Note: The gradation of the sand component of the biofiltration soil media is believed to be a major factor in the infiltration rate of the media mix. If the desired hydraulic conductivity of the biofiltration soil media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified minimum percent passing.

* Compost should be a well-decomposed, stable, weed-free organic matter source derived from waste materials including yard debris, wood wastes, or other organic material not including manure or biosolids meeting standards developed by the USCC. The product shall be certified through the USCC STA Program (a compost testing and information disclosure program). Compost quality shall be verified via a laboratory analysis to be:
  - o Feedstock materials must be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
  - o pH between 6.5 and 8.0 (may vary with plant palette)
  - o Organic Matter: 35 to 75 percent dry weight basis
  - o Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
  - o Maturity/Stability: Compost must have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120°F) upon delivery or rewetting is not acceptable.
  - o Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
    - NH4:NH3 < 3
    - Ammonium < 500 ppm, dry weight basis
    - Seed germination > 80 percent of control
    - Plant trials > 80 percent of control
    - Solvita® > 5 Index value
  - o Nutrient content:
    - Total Nitrogen content ≥ 0.9 percent preferred
    - Total Boron should be < 80 ppm; soluble boron < 2.5 ppm
  - o Salinity: < 6.0 mmhos/cm
  - o Compost for biofiltration area should be analyzed by an accredited laboratory using #200, ¼-inch, ½-inch, and 1-inch sieves (ASTM D422) and meet the gradation requirements in the table below:

Particle Size (ASTM D422)	%Passing by Weight
1 inch	99-100
1/2 inch	90-100
1/4 inch	40-90
#200	2-10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

The gradation of compost used in biofiltration soil media is believed to play an important role in the saturated infiltration rate of the media. To achieve a higher saturated infiltration rate, it may be necessary to utilize compost at the coarser end of the range (minimum percent passing). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, coarser compost mix provides more heterogeneity of the biofiltration soil media, which is believed to be advantageous for more rapid development of soil structure needed to support healthy biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

* Biofiltration soil media not meeting the above criteria should be evaluated on a case-by-case basis. Alternative biofiltration soil media must meet the following specifications:

*Soils for biofiltration facilities must be sufficiently permeable to infiltrate stormwater runoff at a minimum of rate of 5 in/hr during the life of the facility, and provide sufficient retention of moisture and nutrients to support healthy vegetation." The following steps shall be followed by LACDPW to verify that alternative biofiltration soil media mixes meet the specification:

- o Submittals - The applicant must submit to LACDPW for approval:
  - A sample of mixed biofiltration soil media.
  - Certification from the soil supplier or an accredited laboratory that the biofiltration soil media meets the requirements of this specification.
  - Certification from an accredited geotechnical testing laboratory that the biofiltration soil media has an infiltration rate between 5 and 12 in/hr.
  - Organic content test results of the biofiltration soil media. Organic content test shall be performed in accordance with the Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method".
  - Organic grain size analysis results of mixed biofiltration soil media performed in accordance with ASTM D422, Standard Test Method for Particle Size Analysis of Soils.
  - A description of the equipment and methods used to mix the sand and compost to produce the biofiltration soil media.
- o The name of the testing laboratory(ies) and the following information:
  - Contact person(s)
  - Address(es)
  - Phone contact(s)
  - E-mail address(es)
  - Qualifications of laboratory(ies) and personnel including date of current certification by STA, ASTM, or approved equal.
- o Biofiltration soils shall be analyzed by an accredited laboratory using #200 and ½-inch sieves (ASTM D422 or as approved by LACDPW), and meet the gradation described in the table below:

Particle Size (ASTM D422)	%Passing by Weight
1/2 inch	97-100
#200	2-5

* Biofiltration soil media shall be analyzed by an accredited geotechnical laboratory for the following tests:
  - o Moisture - density relationships (compaction tests) must be conducted on biofiltration soil media. Biofiltration soil media for the permeability test shall be compacted to 85 to 90 percent of the maximum dry density (ASTM D1557).
  - o Constant head permeability testing in accordance with ASTM D2434 shall be conducted on a minimum of two samples with a 6-inch mold and vacuum saturation.
* Mulch is recommended for the purpose of retaining moisture, preventing erosion, and minimizing weed growth. Projects subject to the California Model Water Efficiency Landscaping Ordinance (or comparable local ordinance) will be required to provide at least 2 inches of mulch. Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps soil moist, and replenishes soil nutrients. Biofiltration areas must be covered with two to four inches (average three inches) of mulch at the start and an annual placement (preferably in June after

* The planting media design height must be marked appropriately, such as a collar on weeding) of one to two inches of mulch beneath plants.

the overflow device or with a stake inserted two feet into the planting media and notched, to show biofiltration surface level and ponding level.

Vegetation

Prior to installation, a licensed landscape architect must certify that all plants, unless otherwise specifically permitted, conform to the standards of the current edition of American Standard for Nursery Stock as approved by the American Standards Institute, Inc. All plant grades shall be those established in the current edition of American Standards for Nursery Stock.

- o Shade trees must have a single main trunk. Trunks must be free of branches below the following heights:

CALIPER (in)	Height (ft)
1½-2½	5
3	6

- o Plants must be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 96 hours.
- o It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- o It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- o Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs must be used to the maximum extent practicable.

The biofiltration area should be vegetated to resemble a terrestrial forest community ecosystem, which is dominated by understory trees, a shrub layer, and herbaceous ground cover. Select vegetation that:

- o Is suited to well-drained soil;
- o Will be dense and strong enough to stay upright, even in flowing water;
- o Has minimum need for fertilizers;
- o Is not prone to pests and is consistent with Integrated Pest Management practices; and
- o Is consistent with local water conservation ordinance requirements.

Irrigation System

Provide an irrigation system to maintain viability of vegetation, if applicable. The irrigation system must be designed to local code or ordinance specifications.

Overflow Device

An overflow device is required at the 18-inch ponding depth. The following, or equivalent, should be provided:

- o A vertical PVC pipe (SDR 26) to act as an overflow riser.
- o The overflow riser(s) should be eight inches or greater in diameter, so it can be cleaned without damage to the pipe.
- o The inlet to the riser should be at the ponding depth (18 inches for fenced biofiltration areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued (e.g., not removable). The overflow device should convey stormwater runoff in excess of 1.5 times the SWQDv that is not reliably retained on the project site to an approved discharge location (another stormwater quality control measure, storm drain system, or receiving water).

BIO-FILTRATION SYSTEM AND 60"-STORAGE PIPE SYSTEM

GPS:34.063294, -118.104651

NOT TO SCALE

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREON ARE BASED ON N 00° 07' 57" E OF THE CENTERLINE OF PROSPECT AVENUE, AS SHOWN IN PARCEL MAP NO. 17240, P.M.B. 195-11-12.

LEGAL DESCRIPTION:

BEING A SURVEY OF A PORTION OF LOT 8 IN BLOCK 2 OF SUBDIVISION OF THE GARVEY RANCH, IN THE CITY OF ROSEMEAD, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 52, PAGES 43 AND 44 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

COUNTY OF LOS ANGELES BENCHMARK

B.M. REFERENCE	LY11541
ELEVATION	335.84
DESCRIPTION	LACO BM TAG IN S CB 3.3FT E/O BCR @ SE COR EMERSON PL & ISABEL AVE

TRITECH ENGINEERING ASSOCIATES

SUBDIVISION
LAND SURVEY
CIVIL ENGINEERING
& DESIGN

135 N. SAN GABRIEL BLVD.
SAN GABRIEL, CA 91775
TEL: (626) 570-1918
EMAIL: Info@tritechengineer.com

PRELIMINARY
LOW IMPACT DEVELOPMENT PLAN

SCALE: 1"=20'	LID BMPs DETAILS	DRAWN BY: SMITH
DATE: 11/24/2021		REVISED:

7539 GARVEY AVE
ROSEMEAD, CA 91770

SHEET 2 OF 2

JOB NO. 210515