Appendix F:
Preliminary Water Quality Management Plan

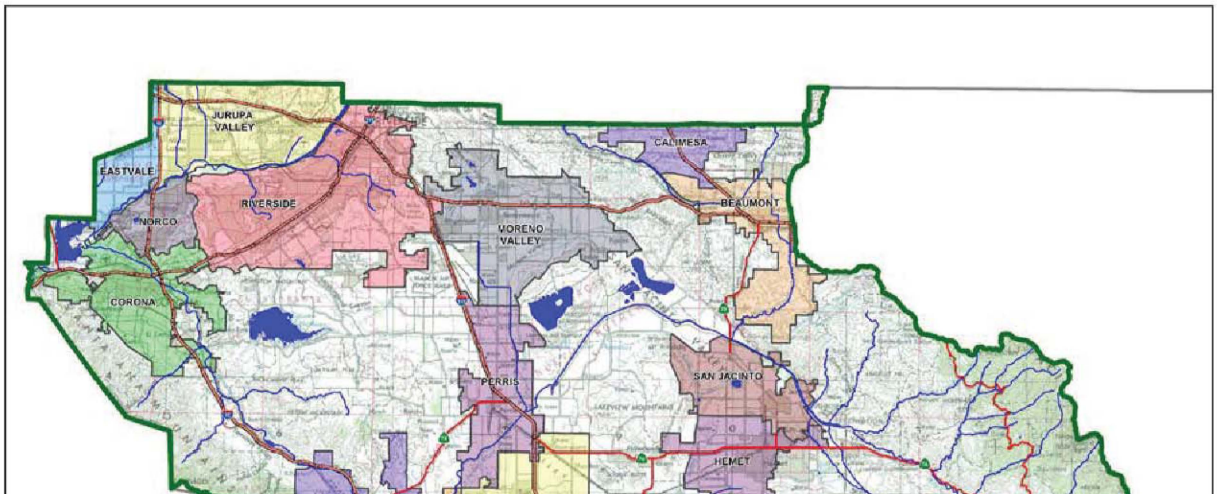
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Gas Station, Convenience Store, and Carwash

Public Works No:

Design Review/Case No:



REGISTERED PROFESSIONAL ENGINEER
MICHAEL P. ST. JACQUES
No. 66815
EX.P. 9.30.22
CIVIL
STATE OF CALIFORNIA

☒ **Preliminary**
☐ **Final**

Original Date Prepared: May 7, 2021

Revision Date(s): 1-19-2022

Michael St. Jacques

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

Contact Information:

Prepared for: Mr. Jaswinder Sondh
17175 Colina Rd. Hacienda Heights, CA., 91745 Tel. No. (626) 224-4636

Prepared by: SPB Engineering, Inc. 1391 Windemere Lane, Tustin, CA. 92780 Ph: 714-931-0912 Email: fiji1961@gmail.com

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Mr. Jaswinder Sondh by SPB Engineering, Inc. for the Gas Station, Convenience Store, and Carwash.

This WQMP is intended to comply with the requirements of the City of Beaumont for Developing vacant land and construction of a proposed gas service station, convenience store, and carwash, Planning Case No. CUP2019-0033 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Beaumont Water Quality Ordinance (Municipal Code Section 13.24.020).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Date
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

Table of Contents

List of Tables

List of Appendices

Section A: Project and Site Information

Project consists of developing vacant land and constructing a gas station, convenience store, and carwash Site is designed to maintain natural drainage where feasible, which conveys stormwater from southeast to northwest with a mild slope, in both existing and developed conditions. This development utilizes grass lined swales and/or concrete v-ditches to convey water to catch basins. Each catch basin is equipped with a treatment control catch basin insert, stormwater is then conveyed via conduits that discharge into underground chambers designed to collect stormwater and allow infiltration of design capture volume of stormwater. Underground infiltration system is located on the northwest corner of site. Excess stormwater discharges from site through a curb face overflow conduit.

PROJECT INFORMATION			
Type of Project:	Commercial-Gas Station, Convenience Store, and Carwash		
Ward Area:			
Community Name:	City of Beaumont		
Development Name:	Commercial-Gas Station, Convenience Store, and Carwash		
PROJECT LOCATION			
Latitude & Longitude (DMS): 33.9284, -116.9665			
Project Watershed and Sub-Watershed: Santa Ana; Santa Ana River, Reach 3			
APN(s): 418-122-021, 418-160-006			
Map Book and Page No.: Map Book 6, Pages 16 and 17 of Maps, Records of San Bernardino County			
PROJECT CHARACTERISTICS			
Proposed or Potential Land Use(s)	Commercial		
Proposed or Potential SIC Code(s)	7542		
Area of Impervious Project Footprint (SF)	53682		
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	44523		
Does the project consist of offsite road improvements?	☒ Y	☐ N	
Does the project propose to construct unpaved roads?	☐ Y	☒ N	
Is the project part of a larger common plan of development (phased project)?	☐ Y	☒ N	
EXISTING SITE CHARACTERISTICS			
Total area of existing Impervious Surfaces within the project limits (SF)	0		
Is the project located within any MSHCP Criteria Cell?	☐ Y	☒ N	
If so, identify the Cell number:			
Are there any natural hydrologic features on the project site?	☐ Y	☒ N	
Is a Geotechnical Report attached?	☒ Y	☐ N	
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)			
What is the Water Quality Design Storm Depth for the project?	0.845		

A.1 Maps and Site Plans

Appendix 1 includes a map of the local vicinity and existing site. In addition, WQMP Site Plan, located in Appendix 1, includes the following:

- Drainage Management Areas
- Source Control BMPs

- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

A.2 Receiving Waters

In order of upstream to downstream, the receiving waters that the project site is tributary to are as follows. A map of the receiving waters is included in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	Hydrologic Unit	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Potrero Creek	1807020201	N/A	MUN, AGR, IND, POW, REC1, REC2, WARM, WILD, RARE	N/A
San Jacinto River	1807020202	N/A	MUN, AGR, IND, POW, REC1, REC2, WARM, WILD, RARE	N/A
Canyon Lake (Railroad Canyon Reservoir)	180702020307	Nutrients, Pathogens	MUN, AGR, GWR, REC1, REC2, WARM, WILD	N/A
Lake Elsinore	180702020308	Nutrients, Organic Enrichment/Low Dissolved Oxygen, PCBs; Sediment Toxicity, Unknown Toxicity	REC1, REC2, WARM, WILD	N/A

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Beaumont Conditional Use Permit Caltrans Encroachment Permit City of Beaumont Grading Permit	☒ Y ☒ Y ☒ Y ☒ Y	☐ N ☐ N ☐ N ☐ N
ESA – Burrowing Owl Survey	☐ Y	☒ N

Section B: Optimize Site Utilization (LID Principles)

This site will utilize permeability of onsite soils, therefore infiltration bmps will be feasible. LID principles utilized for this site will be a combination of source control and structural bmps.

Source control bmps include roofs being conveyed to downspouts that convey and discharge water to vegetated swales where feasible and/or to drain inlets that will have filter systems installed for pre-treatment. Water will then be conveyed to underground detention chambers for infiltration.

Site Optimization

Does the project identify and preserve existing drainage patterns? If so, how? If not, why?

Proposed drainage patterns are consistent with existing, where feasible. Unable to flow from north to south due to new structure located on the south.

Does the project identify and protect existing vegetation? If so, how? If not, why?

No existing vegetation to preserve.

Does the project identify and preserve natural infiltration capacity? If so, how? If not, why?

No, underground infiltration and proprietary treatements are not acceptable for this site.

Does the project identify and minimize impervious area? If so, how? If not, why?

Impervious areas will drain to landscaped areas or filtered catch basin inlets. Inlets where drainage is conveyed will be fitted with filter inserts as pre-treatment before entering modular wetlands linear biofiltration units.

Does the project identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes, all hardscaped areas drain to landscaped areas where feasible and then treated by modular wetlands linear biofiltration units.

Section C: Delineate Drainage Management Areas (DMAs)

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
1A	Roof + Sidewalk	44,523	D
1B	Landscaped	9,159	D

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
N/A	N/A	N/A	N/A

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
1A	Drain Inlet Filters and modular wetlands linear biofiltration units.
1B	Drain Inlet Filters and modular wetlands linear biofiltration units.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (ref: Chapter 2.4.4 of the WQMP Guidance Document)? ☐ Y ☒ N

Geotechnical Report

A Geotechnical Report is required by the City of Beaumont to confirm present and past site characteristics that may affect the use of Infiltration BMPs, see Appendix 3.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☒ Y ☐ N

Infiltration Feasibility

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		X
If Yes, list affected DMAs:		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

D.2 Harvest and Use Assessment

The following conditions apply*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verified with the City of Beaumont).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. (Harvest and Use BMPs are still encouraged, but are not required as the Design Capture Volume will be infiltrated or evapotranspired).

☒ None of the above.

Harvest and Use BMPs need not be assessed for the site.

Irrigation Use Feasibility

Step 1:

Total Area of Irrigated Landscape: 0.21

Type of Landscaping (Conservation Design or Active Turf): Active Turf

Step 2:

Total Area of Impervious Surfaces: 1.02

Step 3:

The project EIATIA factor: 1.1

Step 4:

Minimum required irrigated area: 1.122

Step 5:

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
1.122	0.21

Toilet Use Feasibility

Step 1:

Projected Number of Daily Toilet Users: 100

Project Type: Commercial

Step 2:

Total Area of Impervious Surfaces: 1.02

Step 3:

The project TUTIA factor: 176

Step 4:

Minimum number of toilet users: 179

Step 5:

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
179	100

Other Non-Potable Use Feasibility

N/A.

Step 1:

Average Daily Demand: N/A

Step 2:

Total Area of Impervious Surfaces: N/A

Step 3:

The project factor: N/A

Step 4:

Minimum required use: N/A

Step 5:

Minimum required non-potable use (Step 4)	Projected average daily use (Step 1)
N/A	N/A

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

For the project, the following applies:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

☐ None of the above.

D.4 Feasibility Assessment Summaries

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
1A	☐	☐	☐	☒	☐
1B	☐	☐	☐	☒	☐

D.5 LID BMP Sizing

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Contech Underground Infiltration Chambers*		
	[A]		[B]	[C]	[A] x [C]			
						Design Storm Depth (in)	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D/1A	*44523*	*Roof/Hardscape*	*1*	*0.89*	*39715*			
D/1B	*9159*	*Landscape*	*0.3*	*0.23*	*2062*			
	A_T = Σ[53682]				Σ= [41777]	[0.85]	$[2959] = \frac{[D]x[E]}{12}$	[3372]

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A of the WQMP Guidance Document

[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to confirmation of LID waiver approval by the Regional Board). For the project, the following applies:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Regional Board and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

The project does not create a Hydrologic Condition of Concern, meeting/not meeting the criteria for HCOC Exemption as shown below:

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The City of Riverside has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the City of Riverside

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

Results included in Table F.1 below and hydrologic analysis included in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	12.6	8.6	35
Flow (CFS)	1.53	1.5	1%
Volume (Cubic Feet)			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (Canyon Lake, Lake Elsinore, Santa Ana River) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

F.2 HCOC Mitigation

As an alternative to the HCOC Exemption Criteria above, HCOC criteria is considered mitigated if the project meets one of the following conditions, as indicated:

☐ a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

☐ b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

☒ c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

☐ d. None of the above.

Section G: Source Control BMPs

The following table identifies the potential sources of runoff pollutants for this project and specifies how they are addressed through permanent controls and operational BMPs:

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Storm Drain Inlets	Stenciling should be maintained clear and legible.	Routinely clean catch basin so as to maintain a level not to exceed 40% full/capacity & dispose in accordance with local laws.
Sump Pump	Stenciling should be maintained clear and legible.	Maintain area around sump pump and keep optimal operation by removing debris and sediment from entering pump & dispose waste in accordance with local laws.
Trash Storage Area	Maintain all signs, screens & covers.	Keep area cleaned.
Sidewalk & Parking	Repair damaged sections & ensure clear flow lines, adjust or repair drainage structures.	Keep area clean of trash & debris by sweeping and routine maintenance. Clean up all spills immediately.
Landscape	Remove & replace damaged and/or eroded sections.	Keep areas clean of trash & debris.

Section H: Construction Plan Checklist

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Plan Sheet Number(s)	Latitude / Longitude
D/1	Underground Detention Chambers		33.9284, -116.9665

Section I: Operation, Maintenance and Funding

As required by the City of Riverside, the following Operation, Maintenance and Funding details are provided as summarized:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred.
3. An outline of general maintenance requirements for the Stormwater BMPs selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance.

See Appendix 9 for a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on site, and an agreement assigning responsibility for maintenance and providing for inspections and certification.

Maintenance Mechanism: Property Owner

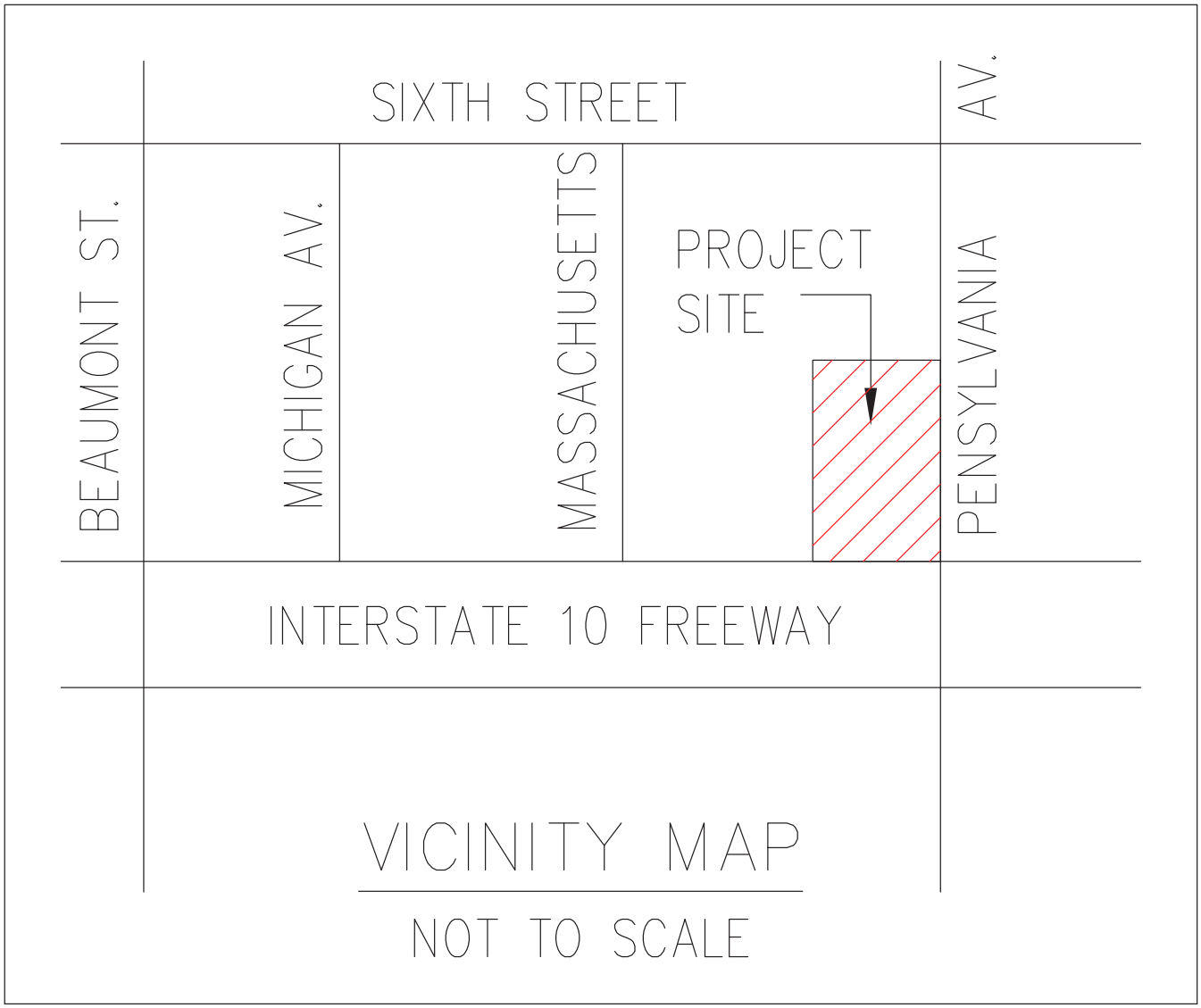
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ Y ☒ N

Operation and Maintenance Plan and Maintenance Mechanism is included in Appendix 9. Educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

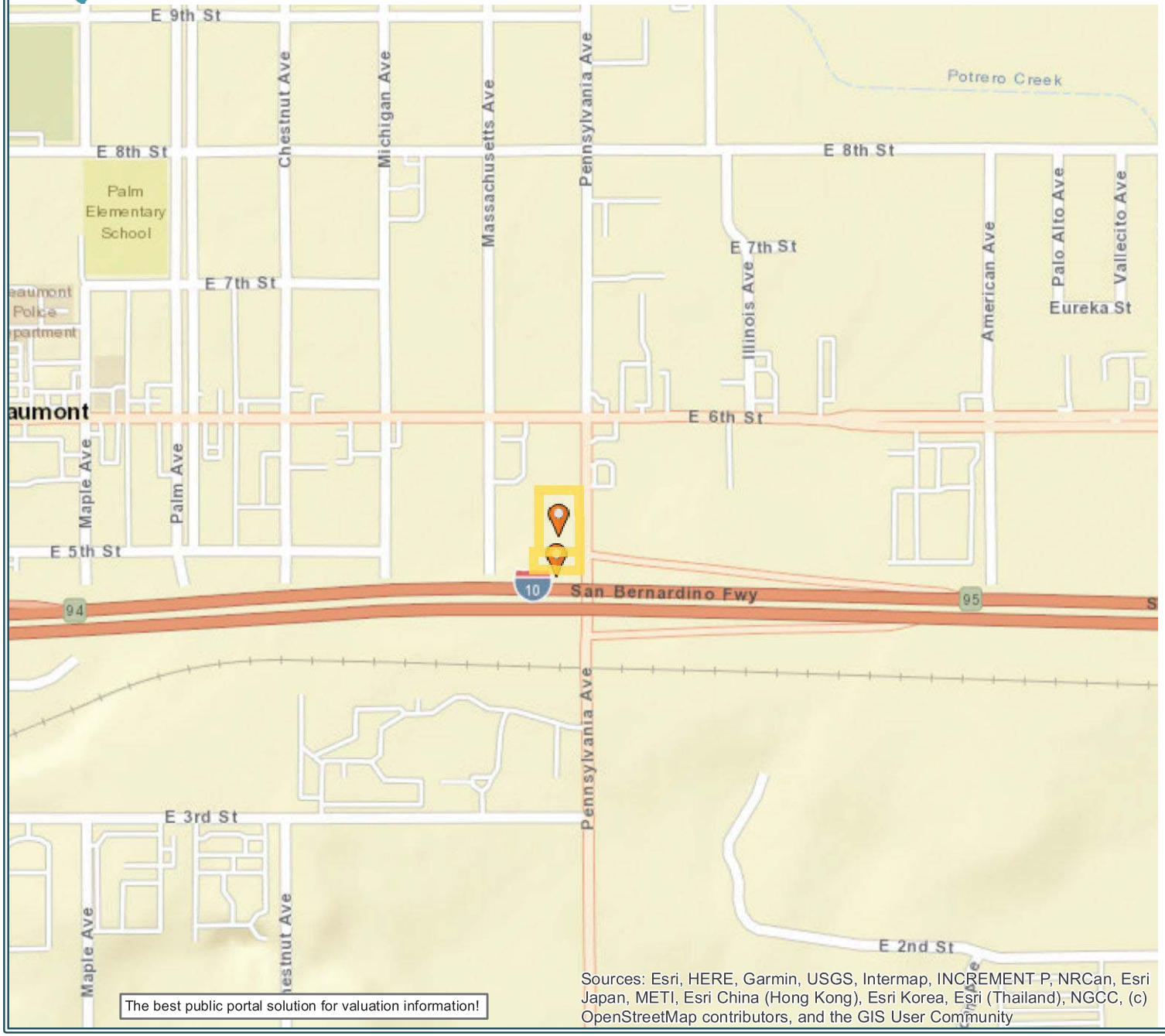


VICINITY MAP

NOT TO SCALE

Aumentum TECHNOLOGIES

Location Map



0 165 330 660 990 1,320 ft

Selection(s)

Selection PIN(s)

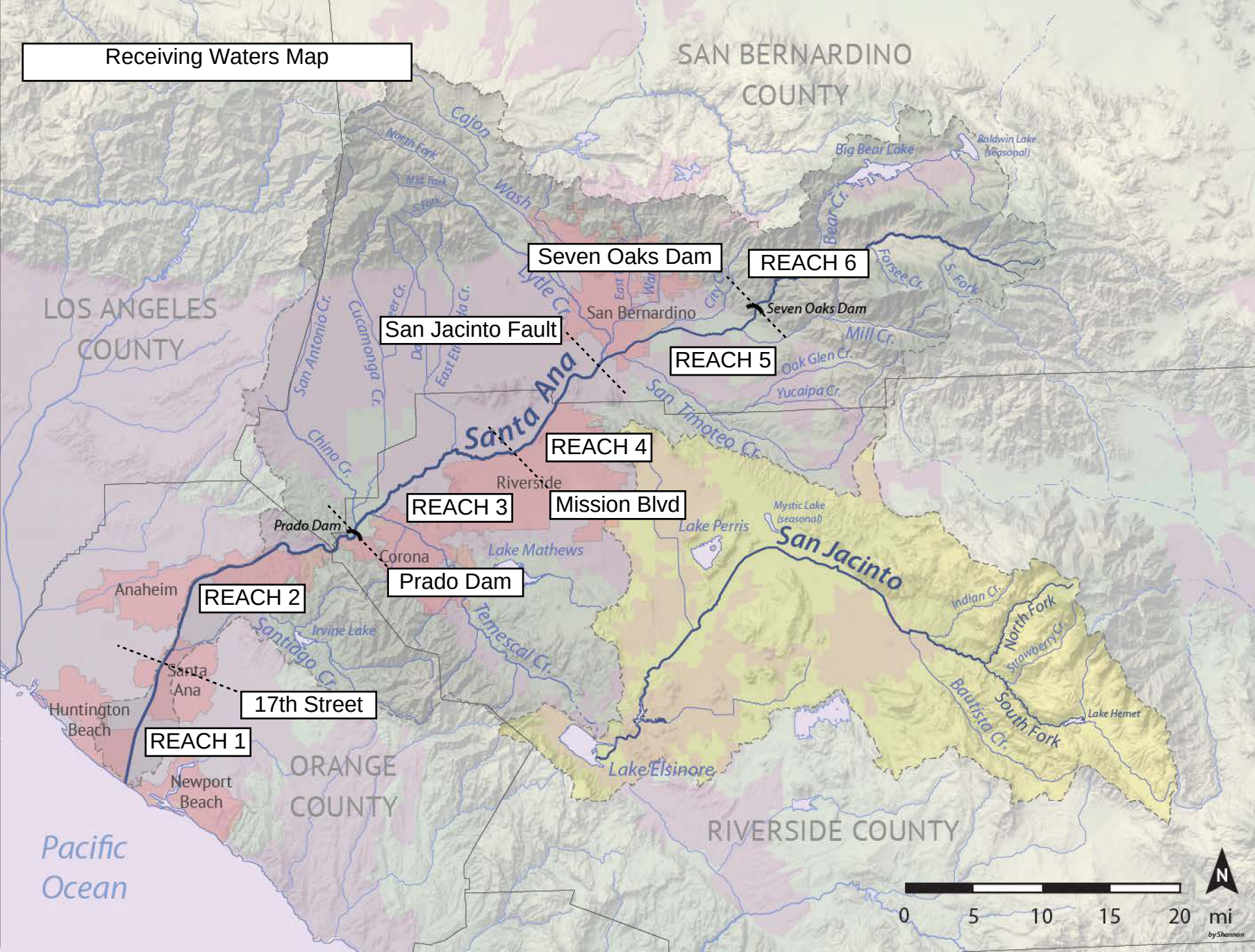
N

5/14/2021

The best public portal solution for valuation information!

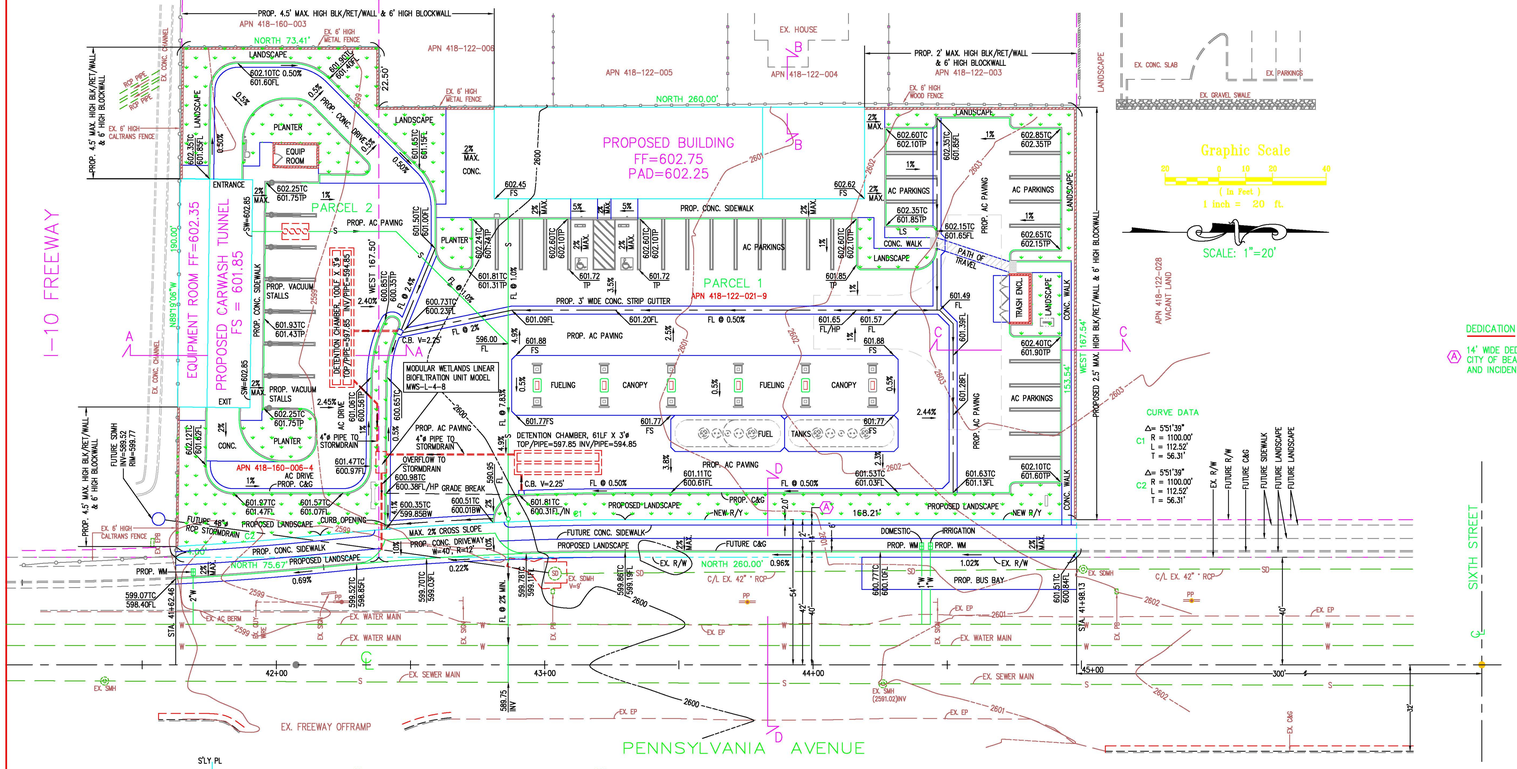
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Data sources: Thomson Reuters Customers, Kansas Geospatial Commons (DASC), U.S. Census, esri.


Receiving Waters Map
SAN BERNARDINO COUNTY
LOS ANGELES COUNTY
ORANGE COUNTY
RIVERSIDE COUNTY
Pacific Ocean
Seven Oaks Dam
REACH 6
San Jacinto Fault
REACH 5
REACH 4
Mission Blvd
REACH 3
Prado Dam
REACH 2
17th Street
REACH 1
Santa Ana
Cajon Wash
North Fork
Mid. Fork
S. Fork
Lytle Cr.
San Antonio Cr.
Cucamonga Cr.
Chino Cr.
East Etiwanda Cr.
San Bernardino
Big Bear Lake
Baldwin Lake (seasonal)
Bear Cr.
Forsee Cr.
S. Fork
Seven Oaks Dam
Mill Cr.
Oak Glen Cr.
Yucaipa Cr.
San Timoteo Cr.
Santa Ana
Riverside
Prado Dam
Corona
Lake Mathews
Lake Perris
Mystic Lake (seasonal)
San Jacinto
Indian Cr.
North Fork
Strawberry Cr.
Bautista Cr.
South Fork
Lake Hemet
Lake Elsinore
Temescal Cr.
Santiago Cr.
Irvine Lake
Anaheim
Santa Ana
Huntington Beach
Newport Beach
0 5 10 15 20 mi
N
by Shannon

BMP PLAN

N/W COR. PENSYLVANIA AVE. & 10 FRWY



Graphic Scale

20 0 10 20 40

(In Feet)

1 inch = 20 ft.

SCALE: 1"=20'

VICINITY MAP

NOT TO SCALE

LEGEND

- LIMIT OF DEVELOPMENT
- LANDSCAPED AREAS
- 1A / 56,851 / D — DRAINAGE MANAGEMENT AREA
- FLOWLINE OR SLOPE DIRECTION
- LOCATIONS FOR CATCH BASIN WITH FILTER INSERT

GENERAL INFORMATION

GROSS AREA = 57,723 sf, 1.325 ac
DEDICATION AREA = 4,041 sf, 0.093 ac
NET AREA = 53,682 sf, 1.232 ac, 100%
PERVIOUS AREA = 9,159 sf, 0.210 ac, 17.06%
IMPERVIOUS AREA = 44,523 sf, 1.022 ac, 82.94%

ADDITIONAL BMP'S:

- SC-10 Non-Stormwater Discharges
- SC-11 Spill Prevention, Control and Cleanup
- SC-34 Waste Handling and Disposal
- SC-35 Safer Alternative Products
- SC-41 Building & Grounds Maintenance
- SC-43 Parking/Storage Area Maintenance
- SC-44 Drainage System Maintenance
- BG-30 Food Service Facilities
- TC-11 Infiltration Basin

DEDICATION

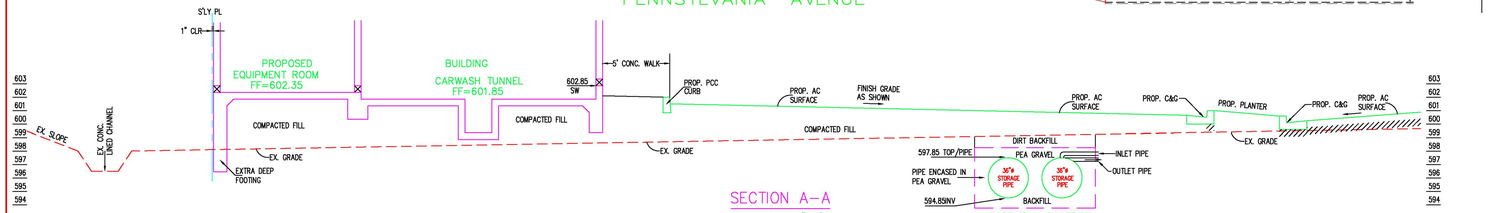
(A) 14' WIDE DEDICATION TO THE CITY OF BEAUMONT FOR ROAD AND INCIDENTAL PURPOSES

CURVE DATA

C1: Δ= 5°51'39" R = 1100.00' L = 112.52' T = 56.31'

C2: Δ= 5°51'39" R = 1100.00' L = 112.52' T = 56.31'

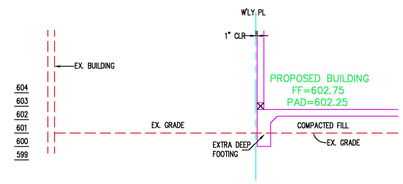
STORAGE CALCULATIONS					STORAGE VOLUME REQUIRED	STORAGE VOLUME PROVIDED
DMA	AREA	PERV.	IMPERV.	% PERV.		
1A	44,523	0	44,523	0%	2,168	–
1B	9,159	9,159	0	100%	651	–
				TOTAL	2,814	3,372



SECTION A–A

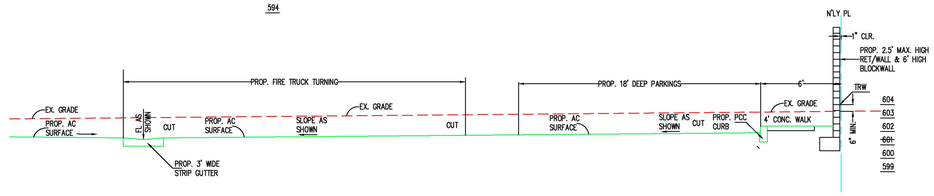
SCALE: H&V 1"=4'

DETENTION CHAMBER



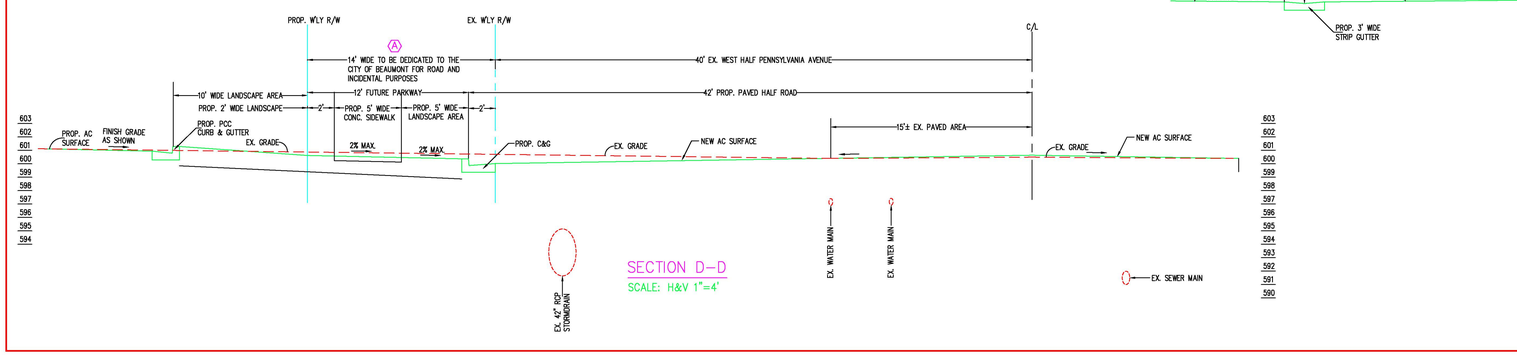
SECTION B–B

SCALE: H&V 1"=4'



SECTION C–C

SCALE: H&V 1"=4'



SECTION D–D

SCALE: H&V 1"=4'

OWNER/DEVELOPER

JSI PROPERTY HOLDING, INC.
9484 SHERWOOD DRIVE
RANCHO CUCAMONGA, CA. 91737
CONTACT PERSON: LAKHBIR SONDH
PHONE: (626) 224-4635
EMAIL: jss_sondh@hotmail.com

PLAN PREPARED BY

SPB ENGINEERING, INC.
1391 WINDEMERE LANE
TUSTIN, CA. 92780
PHONE: (714) 931-0912
EMAIL: flj1961@gmail.com

PREPARED UNDER THE SUPERVISION OF:

(signature \mike-sig#)

MICHAEL P. ST. JACQUES
R.C.E. 66815 EXPIRES 09-30-22

01-11-22
DATE

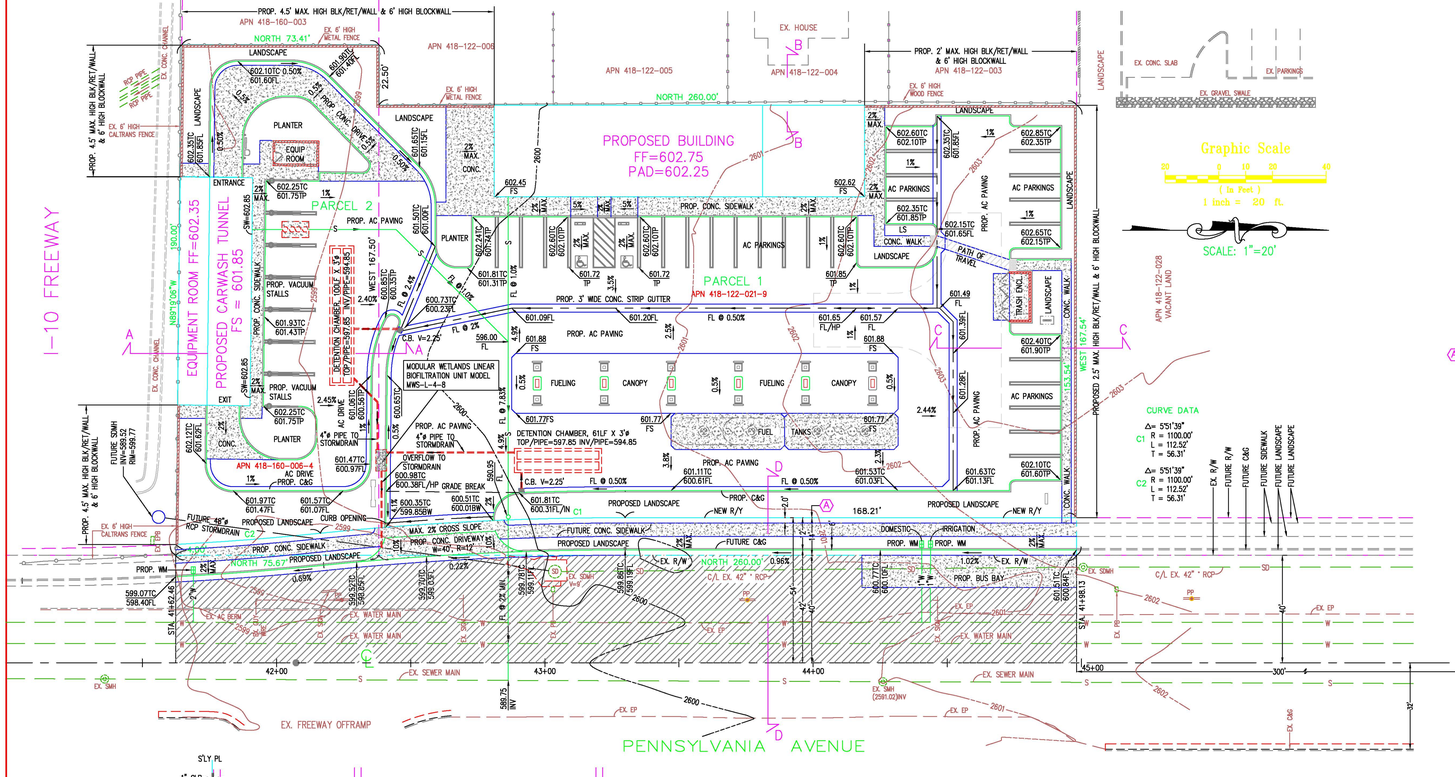
REGISTERED PROFESSIONAL ENGINEER — MICHAEL P. ST. JACQUES — No. 66815 EXP. 9.30.22 CIVIL — STATE OF CALIFORNIA

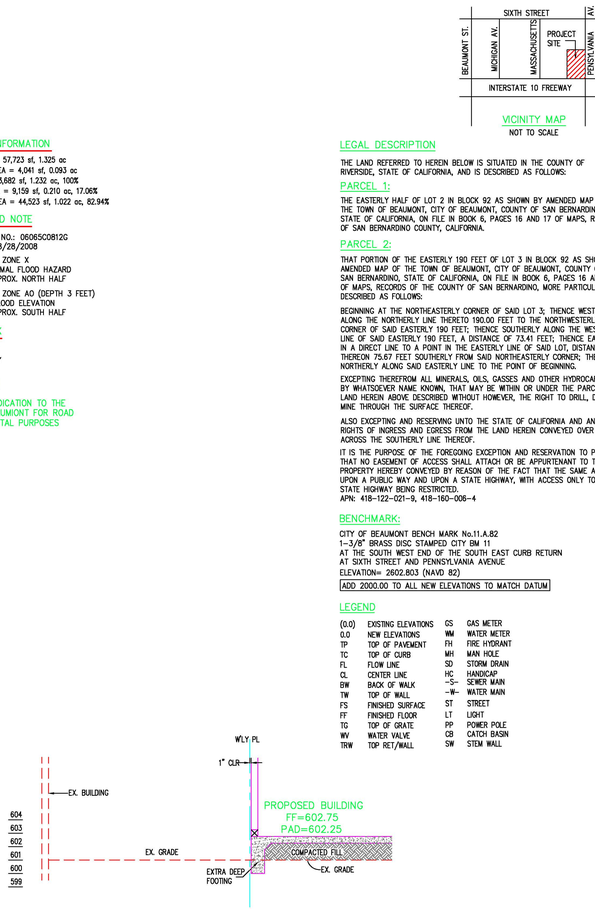
Appendix 2: Construction Plans

Grading and Drainage Plans

PRELIMINARY GRADING PLAN

N/W COR. PENSYLVANIA AVE. & 10 FRWY





VICINITY MAP
NOT TO SCALE

Graphic Scale
20 0 10 20 40
(In Feet)
1 inch = 20 ft.
SCALE: 1"=20'

GENERAL INFORMATION

- GROSS AREA = 57,723 sf, 1.325 ac
- DEDICATION AREA = 4,041 sf, 0.093 ac
- NET AREA = 53,682 sf, 1.232 ac, 100%
- PERVIOUS AREA = 9,159 sf, 0.210 ac, 17.06%
- IMPERVIOUS AREA = 44,523 sf, 1.022 ac, 82.94%

FEMA FLOOD NOTE

DFIRM PANEL NO.: 06065C0812G
EFFECTIVE: 08/28/2008

FLOOD ZONE: ZONE X
AREA OF MINIMAL FLOOD HAZARD
AFFECTS: APPROX. NORTH HALF

FLOOD ZONE: ZONE AO (DEPTH 3 FEET)
WITH BASE FLOOD ELEVATION
AFFECTS: APPROX. SOUTH HALF

EARTHWORK

CUT: 285 CY
FILL: 1705 CY

DEDICATION

(A) 14' WIDE DEDICATION TO THE CITY OF BEAUMONT FOR ROAD AND INCIDENTAL PURPOSES

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1:

THE EASTERLY HALF OF LOT 2 IN BLOCK 92 AS SHOWN BY AMENDED MAP OF THE TOWN OF BEAUMONT, CITY OF BEAUMONT, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ON FILE IN BOOK 6, PAGES 16 AND 17 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

PARCEL 2:

THAT PORTION OF THE EASTERLY 190 FEET OF LOT 3 IN BLOCK 92 AS SHOWN BY AMENDED MAP OF THE TOWN OF BEAUMONT, CITY OF BEAUMONT, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ON FILE IN BOOK 6, PAGES 16 AND 17 OF MAPS, RECORDS OF THE COUNTY OF SAN BERNARDINO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEASTERLY CORNER OF SAID LOT 3; THENCE WESTERLY ALONG THE NORTHERLY LINE THERETO 190.00 FEET TO THE NORTHWESTERLY CORNER OF SAID EASTERLY 190 FEET; THENCE SOUTHERLY ALONG THE WESTERLY LINE OF SAID EASTERLY 190 FEET, A DISTANCE OF 73.41 FEET; THENCE EASTERLY IN A DIRECT LINE TO A POINT IN THE EASTERLY LINE OF SAID LOT, DISTANT THEREON 75.67 FEET SOUTHERLY FROM SAID NORTHEASTERLY CORNER; THENCE NORTHERLY ALONG SAID EASTERLY LINE TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ALL MINERALS, OILS, GASSES AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN, THAT MAY BE WITHIN OR UNDER THE PARCEL OF LAND HEREIN ABOVE DESCRIBED WITHOUT HOWEVER, THE RIGHT TO DRILL, DIG OR MINE THROUGH THE SURFACE THEREOF.

ALSO EXCEPTING AND RESERVING UNTO THE STATE OF CALIFORNIA AND AND ALL RIGHTS OF INGRESS AND EGRESS FROM THE LAND HEREIN CONVEYED OVER AND ACROSS THE SOUTHERLY LINE THEREOF.

IT IS THE PURPOSE OF THE FOREGOING EXCEPTION AND RESERVATION TO PROVIDE THAT NO EASEMENT OF ACCESS SHALL ATTACH OR BE APPURTENANT TO THE PROPERTY HEREBY CONVEYED BY REASON OF THE FACT THAT THE SAME ABUTS UPON A PUBLIC WAY AND UPON A STATE HIGHWAY, WITH ACCESS ONLY TO THE STATE HIGHWAY BEING RESTRICTED.
APN: 418-122-021-9, 418-160-006-4

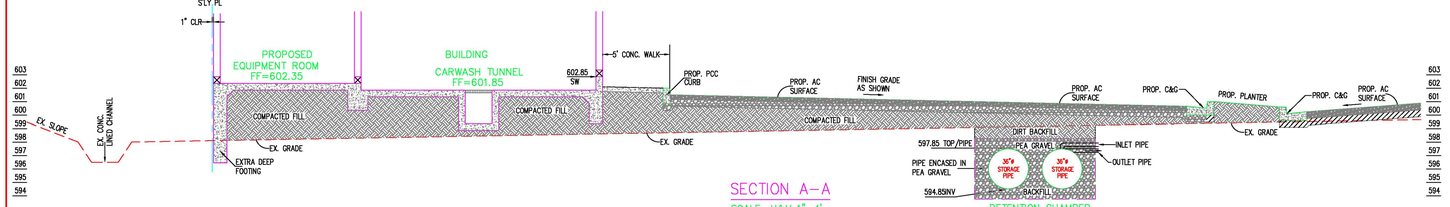
BENCHMARK:

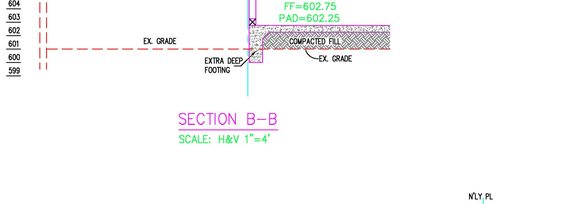
CITY OF BEAUMONT BENCH MARK No.11.A.82
1-3/8" BRASS DISC STAMPED CITY BM 11
AT THE SOUTH WEST END OF THE SOUTH EAST CURB RETURN
AT SIXTH STREET AND PENNSYLVANIA AVENUE
ELEVATION= 2602.803 (NAVD 82)

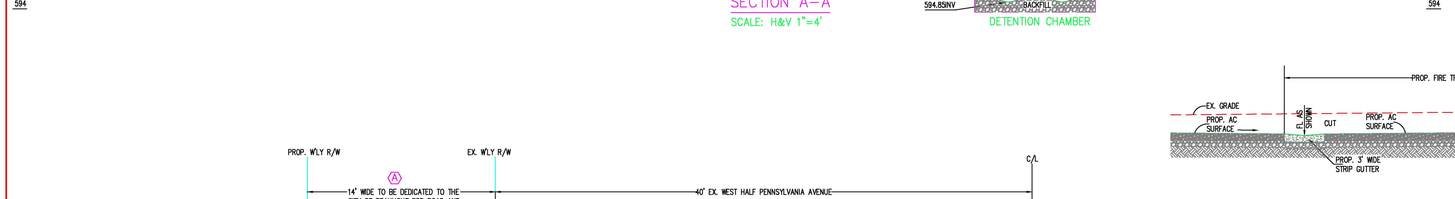
ADD 2000.00 TO ALL NEW ELEVATIONS TO MATCH DATUM

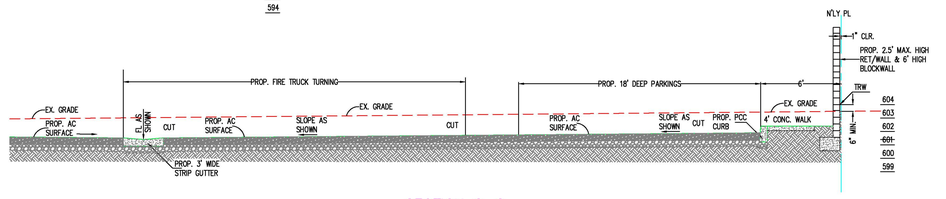
LEGEND

(0.0)	EXISTING ELEVATIONS	GS	GAS METER
0.0	NEW ELEVATIONS	WM	WATER METER
TP	TOP OF PAVEMENT	FH	FIRE HYDRANT
TC	TOP OF CURB	MH	MAN HOLE
FL	FLOW LINE	SD	STORM DRAIN
CL	CENTER LINE	HC	HANDICAP
BW	BACK OF WALK	-S-	SEWER MAIN
TW	TOP OF WALL	-W-	WATER MAIN
FS	FINISHED SURFACE	ST	STREET
FF	FINISHED FLOOR	LT	LIGHT
TG	TOP OF GRATE	PP	POWER POLE
WV	WATER VALVE	CB	CATCH BASIN
TRW	TOP RET/WALL	SW	STEM WALL





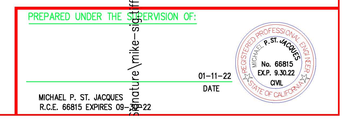




OWNER/DEVELOPER
JSI PROPERTY HOLDING, INC.
9484 SHERWOOD DRIVE
RANCHO CUCAMONGA, CA. 91737
CONTACT PERSON: LAKHBIR SONDH
PHONE: (626) 224-4636
EMAIL: jss_sondh@hotmail.com

PLAN PREPARED BY
SPB ENGINEERING, INC.
1391 WINDEMERE LANE
TUSTIN, CA. 92780
PHONE: (714) 931-0912
EMAIL: fij1961@gmail.com

PREPARED UNDER THE SUPERVISION OF:



MICHAEL P. ST. JACQUES
R.C.E. 66815 EXPIRES 09-30-22

01-11-22
DATE

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GLOBAL GEO-ENGINEERING, INC.

September 11, 2018
Project 7862-06

Sondh Venture Inc.
11768 Fotthill Boulevard
Rancho Cucamonga, California 91730

Attention: Mr. Jaswinder Singh Sondh

Subject: Infiltration Rate
Proposed Developments – *Gas Station and Convenience Store*
Northwest Corner of Pennsylvania Avenue and I-10 Freeway
Beaumont, California

Dear Mr. Sondh:

1. INTRODUCTION

a) As requested, we have conducted an infiltration test for the proposed on-site storm water disposal system to be constructed at the above referenced site located in city of Beaumont, California.

b) An approximate location is shown on the *Location Map, Figure 1.*

c) The purpose of our study was to determine the infiltration rate for the proposed on-site storm water disposal system.

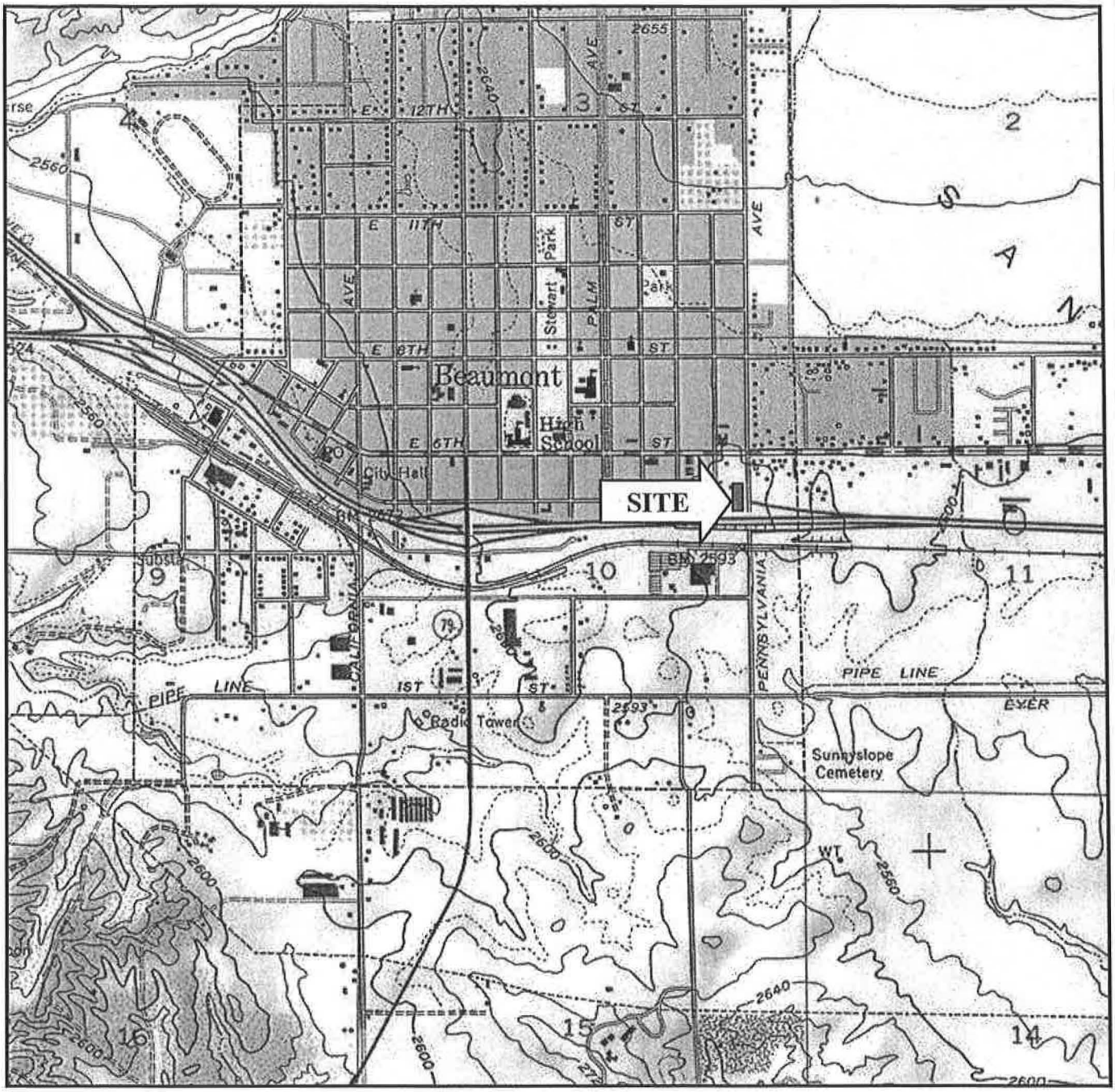
2. FIELD EXPLORATION

a) During the recent geotechnical investigation, we drilled three borings with depths ranging from 20 feet to 30 feet for purpose of geotechnical investigation along with two 8-inch diameter borings for percolation test to determine infiltration rate. Percolation boring P-1 was drilled in the southeast area of the site where as P-2 was drilled on the east side, along Pennsylvania Avenue.

b) The borings were drilled using a truck mounted hollow stem auger drill rig. No Seepage or groundwater was noted to exist in any of the boreholes. *Logs of Borings* are enclosed as *Figures 2 through 6.* The locations of the borings are shown on the *Boring Location Plan, Figure 7.*

3 Corporate Park, Suite 270, Irvine, California 92606
Office (949) 221-0900 Fax (949) 221-0091
e-mail: global@globalgeo.net

LOCATION MAP



BASE MAP: USGS 7.5-Minute Topographic Map,
Beaumont Quadrangle, 1996

2000 0 2000 4000

SCALE FEET

NORTH

GLOBAL GEO-ENGINEERING, INC. GEOLOGIC AND SOILS ENGINEERING IRVINE, CALIFORNIA	Northwest Corner of Pennsylvania Avenue and I-10 Freeway Beaumont, California	
	Date: September 2018	**Figure No:**
	Project No.: 7862-06	1

Global Geo-Engineering, Inc.
Irvine, California
Geologists and Geotechnical Engineers

Northwest Corner of Pennsylvania Avenue
and I-10 Freeway
Beaumont, California

Project 7862-06

LOG OF BORING B-1

Date : August 29, 2018
Logged By : KBY
Drilling Company : Cal Pac
Drilling Rig : Mobile B-53

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- Ring
- Bulk
- Standard Penetration Testing

Water Levels
- Groundwater Encountered
- Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0									Silty SAND: fine grained, orange to dark yellow brown, slightly moist, medium dense, porous with Sandy SILT interbeds
		4.9	101.0	26					
5		9.6	113.6	38					@5' dark orange brown, slightly porous
10		8.4	114.1	38			SM/ML		@9' orange to yellow brown
15		9.0	108.7	57					@14' medium dense to dense, slightly gravelly
20		4.5	107.8	41					@19' yellow brown, more Silty ALLUVIAL FAN DEPOSITS
25									Bottom of Boring at 20 feet:
30									Notes: 1. Caving to 13 feet after augers were removed 2. No groundwater or seepage encountered 3. Boring backfilled
35									

10-01-2018 C:\Program Files (x86)\mtech2014\temp\Boring Logs 2002 Editon\7862-04 - Sondh, Beaumont B-1.bor

Figure 2

Global Geo-Engineering, Inc.
Irvine, California
Geologists and Geotechnical Engineers

Northwest Corner of Pennsylvania Avenue
and I-10 Freeway
Beaumont, California

Project 7862-06

LOG OF BORING B-2

Date : August 29, 2018
Logged By : KBY
Drilling Company : Cal Pac
Drilling Rig : Mobile B-53

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- Ring
- Bulk
- Standard Penetration Testing

Water Levels
- Groundwater Encountered
- Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0									Silty SAND: fine grained, orange brown to yellow brown, slightly moist, medium dense, slightly porous with Sandy SILT interbeds
	☒	8.3	100.2	40					
5	☒	8.6	112.5	55					
	☒	4.7	94.2	29			SM/ML		@9' dark yellow brown
10									
	☒	7.4	117.2	78					@14' medium dense to dense, slightly gravelly
15									
	☒	5.0	104.4	36					ALLUVIAL FAN DEPOSITS
20									Bottom of Boring at 20 feet:
25									
30									
35									

Notes:
1. Caving to 13.5 feet after augers were removed
2. No groundwater or seepage encountered
3. Boring backfilled

Figure 3

10-01-2018 C:\Program Files (x86)\mtech2014\temp\Boring Logs 2002 Edition\7862-04 - Sondh, Beaumont B-2.bor

Global Geo-Engineering, Inc.
Irvine, California

Geologists and Geotechnical Engineers

Northwest Corner of Pennsylvania Avenue and I-10 Freeway
Beaumont, California

Project 7862-06

LOG OF BORING B-3

Date : August 29, 2018
Logged By : KBY
Drilling Company : Cal Pac
Drilling Rig : Mobile B-53

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- Ring
- Bulk
- Standard Penetration Testing

Water Levels
- Groundwater Encountered
- Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0									Silty SAND: fine grained, orange brown, moist, medium dense, slightly porous with Sandy SILT interbeds, slight CLAY content
		12.5	114.0	27					
5		9.6	112.6	27					
10		13.1	116.4	24					@9' orange brown
15		9.4	113.5	27			SM/ML		@14' slightly gravelly
20		13.9	111.7	21					
25		15.7	115.3	24					@24' more Silty, dark orange brown
30		12.4	113.9	30					@29' less Silty, fine to medium grained, yellow brown ALLUVIAL FAN DEPOSITS
35									Bottom of Boring at 30 feet:

Notes:
1. Caving to 24 feet after augers were removed
2. No groundwater or seepage encountered
3. Boring backfilled

10-01-2018 C:\Program Files (x86)\Intech2014\temp\Boring Logs 2002 Edition\7862-04 - Sondh, Beaumont B-3.bor

Figure 4

Global Geo-Engineering, Inc.
Irvine, California

Geologists and Geotechnical Engineers

Northwest Corner of Pennsylvania Avenue and I-10 Freeway
Beaumont, California

Project 7862-06

LOG OF BORING P-1

Date : August 29, 2018
Logged By : KBY
Drilling Company : Cal Pac
Drilling Rig : Mobile B-53

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- Ring
- Bulk
- Standard Penetration Testing

Water Levels
- Groundwater Encountered
- Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine grained, orange brown, moist, medium dense with Sandy SILT interbeds
5									ALLUVIAL FAN DEPOSITS Bottom of Boring at 5 feet:
10									Notes: 1. No groundwater or seepage encountered 2. Perforated pipe and gravel installed for future percolation testing

10-01-2018 C:\Program Files (x86)\mtech2014\temp\Boring Logs 2002 Editon\7862-04 - Sondh, Beaumont P-1.bor

Figure 5

Global Geo-Engineering, Inc.
Irvine, California
Geologists and Geotechnical Engineers

Northwest Corner of Pennsylvania Avenue
and I-10 Freeway
Beaumont, California

Project 7862-06

LOG OF BORING P-2

Date : August 29, 2018
Logged By : KBY
Drilling Company : Cal Pac
Drilling Rig : Mobile B-53

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- Ring
- Bulk
- Standard Penetration Testing

Water Levels
- Groundwater Encountered
- Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine grained, orange brown to yellow brown, slightly moist, medium dense with Sandy SILT interbeds
5									ALLUVIAL FAN DEPOSITS
									Bottom of Boring at 5 feet:
10									Notes: 1. No groundwater or seepage encountered 2. Perforated pipe and gravel installed for future percolation testing

Figure 6

10-01-2018 C:\Program Files (x86)\mtech2014\temp\Boring Logs 2002 Editon\7862-04 - Sondh, Beaumont P-2.bor

c) All the borings encountered Silty SAND alluvium soils.

3. PERCOLATION STUDY

a) The percolation study was conducted in both the borings.

b) The borings were thoroughly pre-soaked for a period of 24 hours. The percolation testing was conducted on the next day following the pre-soak. From a fixed reference point, the drop in the water level was measured in 60-minute intervals for a period of just over, six hours for all the borings, refilling after every reading. The results of the field percolation tests are provided in *Figure 8 and 9*. Before the testing started the Boring P-1 had 30 inches of water left from the pre-soak and the Boring P-2 had 10 inches of water left from the pre-soak.

c) The drops in the water during the last reading period of 60 minutes and the corresponding percolation rates were:

Boring No.	Date	Drop (Inches)	Percolation Rate (min/inch)
P-1	August 30, 2018	1.75	34.3
P-2	August 30, 2018	7	8.6

d) In accordance with *Riverside County – Low Impact Development BMP Design Handbook,* Page 20 (see attached), we used *Porchet* method to calculate the infiltration rate. The rates are shown below:

Boring No.	Percolation Rate (inch/hour)
P-1	0.05
P-2	0.24

e) These rates are calculated using a factor of safety of 1.0. Appropriate factor of safety should be utilized while designing the basin.

Field Percolation Test

Test Hole No:	P-1

Depth of Test Hole (D_T):	66 inches
Diameter of Test Hole:	8 inches
Presoak Date:	8/29/2018
Water Level after Presoak:	30 inches
Test Date:	8/30/2018
Tested by:	ERV

Trial No.	ΔT	D_o	D_f	ΔD	Percolation Rate (min/in.)
	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	
1	60	0	3	3	20
2	60	0	2.5	2.5	24
3	60	0	2	2	30
4	60	0	2	2	30
5	60	0	1.75	1.75	34.29
6	60	0	1.75	1.75	34.29

***Note** = D_o and D_f measured from the top of the ground surface

Northwest Corner of Pennsylvania Avenue and I-10 Freeway Beaumont, California	
Date: September 2018	Figure No: 8
Project No: 7862-06	

Field Percolation Test

Test Hole No:	P-2

Depth of Test Hole (D_T):	60 inches
Diameter of Test Hole:	8 inches
Presoak Date:	8/29/2018
Water Level after Presoak:	10 inches
Test Date:	8/30/2018
Tested by:	ERV

Trial No.	ΔT	D_o	D_f	ΔD	Percolation Rate (min/in.)
	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	
1	60	0	8	8	7.5
2	60	0	8	8	7.5
3	60	0	7.5	7.5	8
4	60	0	7.25	7.25	8.28
5	60	0	7	7	8.57
6	60	0	7	7	8.57

***Note** = D_o and D_f measured from the top of the ground surface

Northwest Corner of Pennsylvania Avenue and I-10 Freeway Beaumont, California	
Date: September 2018	Figure No: 9
Project No: 7862-06	

2.3 - Percolation Tests

The ***percolation test*** is widely used for assessing the suitability of a soil for onsite wastewater disposal. Depending on the required depth of testing, there are two versions of the percolation test. For shallow depth testing (less than 10 feet), the procedure would be as shown in Figure 8 (Photo 6). For deep testing (10 feet to 40 feet), the procedure is as shown in Figure 9. For deep testing, special care must be taken to ensure that caving of the sidewalls does not occur.

This test measures the length of time required for a quantity of water to infiltrate into the soil and is often called a "percolation rate". It should be noted that the percolation rate is related to, but not equal to, the infiltration rate. While an infiltration rate is a measure of the speed at which water progresses downward into the soil, the percolation rate measures not only the downward progression but the lateral progression through the soil as well. This reflects the fact that the surface area for infiltration testing would include only the horizontal surface while the percolation test includes both the bottom surface area and the sidewalls of the test hole. However, there is a relationship between the values obtained by a percolation test and infiltration rate. Based on the [1]"Porchet Method", the following equation may be used to convert percolation rates to the tested infiltration rate, I_t:

$$I_t = \frac{\Delta H\ \pi r^2 60}{\Delta t(\pi r^2 + 2\pi r H_{avg})} = \frac{\Delta H\ 60\ r}{\Delta t(r + 2H_{avg})}$$

Where:

I_t = tested infiltration rate, inches/hour
ΔH = change in head over the time interval, inches
Δt = time interval, minutes
*r = effective radius of test hole
H_{avg} = average head over the time interval, inches

An example of this procedure is provided on Page 26 based data form Table 5, *Sample Percolation Test Data*. Figure 11 provides a plot of the converted percolation test data.

*Where a rectangular test hole is used, an equivalent radius should be determined based on the actual area of the rectangular test hole. (i.e., $r = (A/\pi)^{0.5}$)

Note to the designer: The values obtained using this method may vary from those obtained from methods considered to be more accurate. The designer is encouraged to explore the derivation of these equations (Ritzema; Smedema)

Final Report - Ultimately, as discussed in Section 1.7, a final report shall be provided and, based on the test results, an infiltration rate shall be recommended.

[1]H.P. Ritzema, "Drainage Principles and Applications," International Institute for Land Reclamation and Improvement (ILRI), Publication 16, 2nd revised edition, 1994, Wageningen, The Netherlands.

The opportunity to be of service is sincerely appreciated. If you have any questions or if we can be of further assistance, please call.

Very truly yours,

GLOBAL GEO-ENGINEERING, INC.

Mohan B. Upasani
Principal Geotechnical Engineer
RGE 2301
(Exp. March 31, 2019)

Enclosures:

Location Map	- Figure 1
Logs of Borings	- Figures 2 through 6
Boring Location Plan	- Figure 7
Field Percolation Test Data	- Figures 8 and 9

Riverside County – Low Impact Development BMP Design Handbook, Page 20
Terms and Conditions

TERMS AND CONDITIONS OF AUTHORIZATION

Consultant shall serve Client by providing professional counsel and technical advice regarding subsurface conditions consistent with the scope of services agreed-to between the parties. Consultant will use his professional judgment and will perform his services using that degree of care and skill ordinarily exercised under similar circumstances, by reputable foundation engineers and/or engineering geologists practicing in this or similar localities.

- In assisting Client, the Consultant may include or rely on information and drawings prepared by others for the purpose of clarification, reference or bidding; however, by including the same, the Consultant assumes no responsibility for the information shown thereon and Client agrees that Consultant is not responsible for any defects in its services that result from reliance on the information and drawings prepared by others. Consultant shall not be liable for any incorrect advice; judgment or decision based on any inaccurate information furnished by the Client or any third party, and Client will indemnify Consultant against claims, demands, or liability arising out of, or contribute to, by such information.

- Unless otherwise negotiated in writing, Client agrees to limit any and all liability, claim for damages, cost of defense, or expenses to be levied against Consultant on account of design defect, error, omission, or professional negligence to a sum **not to exceed ten thousand dollars or charged fees whichever is less**. Further, Client agrees to notify any construction contractor or subcontractor who may perform work in connection with any design, report, or study prepared by Consultant of such limitation of liability for design defects, errors, omissions, or professional negligence, and require as a condition precedent to their performing the work a like limitation of liability on their part as against the Consultant. In the event the Client fails to obtain a like limitation of liability provision as to design defects, errors, omissions or professional negligence, any liability of the Client and Consultant to such contractor or subcontractor arising out of a negligence shall be allocated between Client and Consultant in such a manner that the aggregate liability of Consultant for such design defects to all parties, including the Client shall **not exceed ten thousand dollars or charged fees whichever is less**. No warranty, expressed or implied of merchantability or fitness, is made or intended in connection with the work to be performed by Consultant or by the proposal for consulting or other services or by the furnishing of oral or written reports or findings made by Consultant.

- The Client agrees, to the fullest extent permitted by law, to indemnify, defend and hold harmless the Consultant, its officers, directors, employees, agents and subconsultants from and against all claims, damages, liabilities or costs, including reasonable attorney's fees and defense costs, of any nature whatsoever arising from or in connection with the Project to the extent that said claims, damages, liabilities or costs arise out of the work, services, or conduct of Client or Client's contractors, subconsultants, or other third party not under Consultant's control. Client further agrees that the duty to defend set forth herein arises immediately and is not contingent on a finding of fault against Client or Client's contractors, subconsultants, or other third parties. Client shall not be obligated under this provision to indemnify Consultant for Consultant's sole negligence or willful misconduct.

- Client shall grant free access to the site for all necessary equipment and personnel and Client shall notify any and all possessors of the project site that Client has granted Consultant free access to the project site at no charge to Consultant unless expressly agreed to otherwise in writing.

- If Client is not the property owner for the subject Project, Client agrees that it will notify the property owner of the terms of this agreement and obtain said property owner's approval to the terms and conditions herein. Should Client fail to obtain the property owner's agreement as required herein, Client agrees to be solely responsible to Consultant for all damages, liabilities, costs, including litigation fees and costs, arising from such failure that exceed that limitation of Consultant's liability herein.

- Client shall locate for Consultant and shall assume responsibility for the accuracy of his representations as to the locations of all underground utilities and installations. Consultant will not be responsible for damage to any such utilities or installation not so located.

- Client and Consultant agree to waive claims against each other for consequential damages arising out of or relating to this agreement. Neither party to this agreement shall assign the contract without the express, written consent of the other party.

- Consultant agrees to cover all open test holes and place a cover to carry a 200-pound load on each hole prior to leaving project site unattended. Consultant agrees that all test holes will be backfilled upon completion of the job. However, Client may request test holes to remain open after completion of Consultants work. In the event Client agrees to pay for all costs associated with covering and backfilling said test holes at a later date, and Client shall indemnify, defend and hold harmless Consultant for all claims, demands and liabilities arising from his request, except for the sole negligence of the Consultant, to the extent permitted by law.

- Consultant shall not be responsible for the general safety on the job or for the work of Client, other contractors and third parties.

- Consultant shall be excused for any delay in completion of the contract caused by acts of God, acts of the Client or Client's agent and/or contractors, inclement weather, labor trouble, acts of public utilities, public bodies, or inspectors, extra work, failure of Client to make payments promptly, or other contingencies unforeseen by Consultant and beyond reasonable control of the Consultant.

- In the event that either party desires to terminate this contract prior to completion of the project, written notification of such intention to terminate must be tendered to the other party. In the event Client notifies Consultant of such intention to terminate Consultant's services prior to completion of the contract, Consultant reserves the right to complete such analysis and records as are necessary to place files in order, to dispose of samples, put equipment in order, and (where considered necessary to protect his professional reputation) to complete a report on the work performed to date. In the event that Consultant incurs cost in Client's termination of this Agreement, a termination charge to cover such cost shall be paid by Client.

- If the Client is a corporation, the individual or individuals who sign or initial this Contract, on behalf of the Client, guarantee that Client will perform its duties under this Contract. The individual or individuals so signing or initialing this Contract warrant that they are duly authorized agents of the Client.

- Any notice required or permitted under this Contract may be given by ordinary mail at the address contained in this Contract, but such address may be changed by written notice given by one party to the other from time to time. Notice shall be deemed received in the ordinary course of the mail. This agreement shall be deemed to have been entered into the County of Orange, State of California.

LIMITATIONS

Our findings, interpretations, analyses, and recommendations are professional opinions, prepared and presented in accordance with generally accepted professional practices and are based on observation, laboratory data and our professional experience. Consultant does not assume responsibility for the proper execution of the work by others by undertaking the services being provided to Client under this agreement and shall in no way be responsible for the deficiencies or defects in the work performed by others not under Consultant's direct control. No other warranty herein is expressed or implied.

September 21, 2018
Project 7862-04

Sondh Venture Inc.
11768 Fotthill Boulevard
Rancho Cucamonga, California 91730

Attention: Mr. Jaswinder Singh Sondh

Subject: Geotechnical Investigation Report
Proposed Developments – *Gas Station and a Convenience Store*
Northwest Corner of Pennsylvania Avenue and I-10 Freeway
Beaumont, California

References: See *Appendix A*

Dear Mr. Sondh:

1. INTRODUCTION

a) In accordance with your request, we have conducted a geotechnical investigation for the planned improvements at the subject property located in Beaumont, California.

b) We reviewed the preliminary site plan provided to us. The planned development will include construction of a gas station, a car wash and 3,800 square feet convenience store and parking areas on an approximate 1.33-acre vacant lot. A retention basin is also proposed for the storm water runoff.

c) Grading and structural plans are not available at this time. However, we have assumed wall loads of 3 kip/ft and a column load of 50 kips. Also, we have assumed that the proposed grades will not change significantly from the existing grades.

d) This report is subject to the Terms and Conditions enclosed to this report and incorporated herein by reference.

2. SCOPE

The scope of services we provided was as follows:

a) Preliminary planning and preparation;

b) Review of available geotechnical reports and maps, pertaining to the site;

c) Field exploration, consisting of excavating five borings to depths ranging from 5 to 30 feet below ground surface using a truck mounted hollow stem auger drill rig. Two of the 5-foot deep borings were used for percolation testing;

d) Logging of the borings by our Engineering Geologist;

e) Obtaining in-situ and bulk samples for classification and laboratory testing;

f) Laboratory testing of selected samples considered representative of site conditions, in order to derive relevant engineering properties;

g) Geotechnical analyses of the field and the laboratory data;

h) Preparation of a final geotechnical report presenting our findings, conclusions and recommendations pertaining to:

i) grading;

ii) processing of soils;

iii) foundation type(s);

iv) foundation depths;

v) bearing capacity;

vi) expansivity;

vii) sulphate content and cement type;

viii) shrinkage factor, subsidence;

ix) slabs-on-grade;

x) settlement;

xi) retaining walls (if any):

- active pressure;
- at-rest pressure;
- passive resistance;
- coefficient of friction;

xii) seismic characteristics;

xiii) drainage and ground water.

3. FIELD EXPLORATION

Details of the field investigation, including the *Logs of Borings* for this investigation, are presented in *Appendix B.*

4. LABORATORY TESTING

A description of the laboratory testing and the results is presented in *Appendix C.*

5. SITE DESCRIPTION

5.1 Location

a) The property is located at the northwestern corner of Pennsylvania Avenue and the I-10 Freeway in the city of Beaumont, California.

b) The approximate project location is shown on the *Location Map, Figure 1*.

5.2 Surface Site Conditions

a) The project site is currently vacant and void of any building structures. The ground surface within the central area of the site is generally bare of any vegetation. The northern and southern ends of the property are covered with a moderate growth of grass, weeds and trees. A few shallow dirt stockpiles have been dumped at the southern end of the project site.

b) The ground surface within the property boundaries is relatively level. The natural ground surface within the project site area descends to the south at a 1.5 percent gradient.

c) Surface drainage at the site consists of sheet flow runoff of incident rainfall, derived from within the property boundaries and surrounding upgradient areas. The nearest predominant drainage feature is the San Gorgonio River, located about 4.7 miles northeast of the project site.

5.4 Geology

5.4.1 Regional Geologic Setting

The project site is located within the San Gorgonio Pass area of Riverside County, which forms part of the Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges consist of a series of mountain ranges separated by longitudinal valleys. The ranges trend northwest-southeast and are sub-parallel to faults branching from the San Andreas Fault. The Peninsular Ranges extend from the southern side of the Santa Monica Mountains and the San Gabriel Mountains into Baja California, Mexico (CDMG, 1997).

5.4.2 Local Geologic Setting

The project site area is underlain by Holocene- to Pleistocene-age alluvial deposits derived from the erosional processes within the nearby San Bernardino Mountains.

5.5 Subsurface Site Conditions

5.5.1 General

The following paragraphs generally describe the subsurface materials encountered in our boring excavations. The locations of the borings are shown on our *Boring Location Plan, Figure B-7*.

5.5.2 Alluvial Fan Deposits

a) Holocene-aged to Pleistocene-aged alluvial fan deposits, consisting of Silty SAND with Sandy SILT interbeds, were encountered in our boring excavations.

b) The alluvial sediments were generally found to be fine grained, orange brown to yellowish brown, slightly moist to moist, and medium dense to dense.

6. GROUND WATER

a) No groundwater or seepage was encountered in any our boring excavations.

b) Our review of well data records provided on the *California Department of Water Resources* internet website shows that the closest groundwater well is located approximately 3,000 feet south of the project site. Numerous groundwater level measurements were shown to have been collected from the well during the period from April 2005 to October 2010. Groundwater levels were generally found to range between 70 and 120 feet below ground surface.

7. POTENTIAL SEISMIC HAZARDS

7.1 General

a) The property is located in the general proximity of several active and potentially active faults, which are typical for sites in the Southern California region. Earthquakes occurring on active faults within a 70-mile radius are capable of generating ground shaking of engineering significance to the proposed construction.

b) In Southern California, most of the seismic damage to manmade structures results from ground shaking and, to a lesser degree, from liquefaction and ground rupture caused by earthquakes along active fault zones. In general, the greater the magnitude of the earthquake, the greater is the potential damage.

7.2 Ground Surface Rupture

a) The subject property is not situated within a State of California delineated *Earthquake Fault Zone* (formerly known as the *Alquist-Priolo Special Studies Zone*), however, during historic times, a number of major earthquakes have occurred along active faults in Southern California. The closest known active fault is the Banning-San Gorgonio Pass Fault Zone, located at a distance of about 1.5 miles northeast of the project site.

b) Other known active faults include the San Jacinto Fault and the San Andreas Fault, located at distances of about 6.9 miles and 7.6 miles, respectively, from the subject property.

c) Due to the distance of the closest active fault to the site, ground rupture is not considered a significant hazard at the site.

7.3 Deterministic Seismic Hazard Analysis

a) We utilized the *U.S. Seismic Design Maps* internet program provided by the U.S. Geological Survey to calculate the peak ground acceleration (PGA) at the project site location. Using the 2010 ASCE-7 (w/March 2013 errata) standard, the PGA at the subject property resulted to be 0.547g.

b) *Figure 2* shows the geographical relationships among the site locations, nearby faults and the epicenters of significant occurrences. From the seismic history of the region and proximity, the San Andreas Fault has the greatest potential for causing earthquake damage related to ground shaking at this site.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 General

a) It is our opinion that the site will be suitable for the proposed development from a geotechnical aspect, assuming that our recommendations are incorporated in the project plan designs and specifications, and are implemented during construction.

b) We are of the opinion that the proposed structures may be supported on shallow spread footings, founded in the compacted fill. The dispenser canopy footings can be supported by the native soils.

c) We are also of the opinion that with due and reasonable precautions, the required grading will not endanger adjacent property nor will grading be affected adversely by adjoining property.

d) The design recommendations in the report should be reviewed during the grading phase when soil conditions in the excavations become exposed.

e) The final grading plans and foundation plans/design loads should be reviewed by the Geotechnical Engineer.

8.2 Grading

8.2.1 Processing of On-Site Soils

a) We recommend that the soils under the car wash and the convenience store should be overexcavated to a depth of 3 feet below the pad grade and one foot below the deepest footing bottom and replaced with compacted fill, subject to review during the grading operations.

b) The recommended overexcavation will provide at least one foot of compacted fill below the bottom of the footings. Deeper overexcavation will be required if the footings are designed to be deeper than 2 feet.

c) The canopy footings are expected to be deeper than 2 feet; as such no overexcavation below the footings is deemed necessary, subject to review during the construction.

d) The overexcavation should extend laterally beyond the edges of the footings for a distance equal to the depth of the overexcavation below the footings.

e) Wherever structural fills are to be placed, the upper 6 to 8 inches of the subgrade should, after stripping or overexcavation, first be scarified and reworked.

f) There should be at least 12 inches of reworked existing soils or compacted fill under exterior hardscape areas, subject to review during the grading.

g) Any loosening of reworked or native material, consequent to the passage of construction traffic, weathering, etc., should be made good prior to further construction.

h) The depths of overexcavation should be reviewed by the Geotechnical Engineer during construction. Any surface or subsurface obstructions, or any variation of site materials or conditions encountered during grading should be brought immediately to the attention of the Geotechnical Engineer for proper exposure, removal or processing, as directed.

i) No underground obstructions or facilities should remain in any structural areas. Depressions and/or cavities created as a result of the removal of obstructions should be backfilled properly with suitable materials, and compacted.

8.2.2 Material Selection

After the site has been stripped of any debris, vegetation and organic soils, excavated on-site soils are considered satisfactory for reuse in the construction of on –site fills, with the following provisions:

a) The organic content does not exceed 3 percent by volume;

b) Large size rocks greater than 8 inches in diameter should not be incorporated in compacted fill;

c) Rocks greater than 4 inches in diameter should not be incorporated in compacted fill to within 1 foot of the underside of the footings and slabs.

8.2.3 Compaction Requirements

a) Reworking/compaction shall include significant moisture-conditioning as needed to bring the soils to slightly above the optimum moisture content. All reworked soils and structural fills should be densified to achieve at least 90 percent relative compaction with reference to laboratory compaction standard.

b) The optimum moisture content and maximum dry density should be determined in the laboratory in accordance with ASTM Test Designation D1557.

c) Fill should be compacted in lifts not exceeding 8 inches (loose).

8.2.4 Excavating Conditions

a) Excavation of on-site materials may be accomplished with standard earthmoving or trenching equipment. No hard rock was encountered which will require blasting.

b) No seepage or ground water was encountered in any of our excavations. Dewatering is not anticipated.

8.2.5 Shrinkage

For preliminary earthwork calculation, an average shrinkage factor of 7 percent is recommended for the fill soils (this does not include handling losses).

8.2.6 Expansion Potential

a) Due the presence granular Silty SAND, expansion potential of the subgrade site soils is considered *low*.

b) The soil expansion potential for building pad should be determined during the final stages of rough grading.

8.2.7 Sulphate Content

The sulphate exposure based on the results of the laboratory is less than 0.1 percent. The sulphate exposure of the subgrade soils is considered to be *negligible.*

8.2.8 Utility Trenching

a) The walls of temporary construction trenches in fill should stand nearly vertical, with only minor sloughing, provided the total depth does not exceed 4 feet (approximately).

b) Trenches should be located so as not to impair the bearing capacity or to cause settlement under foundations. As a guide, trenches should be clear of a 45-degree plane, extending outward and downward from the edge of foundations. Shoring should comply with Cal-OSHA regulations.

c) Existing soils may be utilized for trenching backfill, provided they are free of organic materials.

d) All work associated with trench shoring must conform to the state and federal safety codes.

8.2.9 Construction Cuts

a) The recommended overexcavation will require the cuts to be on the order of 3 feet. The cut can be made vertical subject to review during the excavation.

b) If it is determined that the recommended cut will not be safe, it may be laid back at a gradient of 1:1 with the lower 3 feet vertical) or shoring may be required.

8.2.10 Surface Drainage Provisions

Positive surface gradients should be provided adjacent to the buildings to direct surface water run-off away from structural foundations and to suitable discharge facilities.

8.2.11 Grading Control

a) All grading and earthwork should be performed under the observation of a Geotechnical Engineer in order to achieve proper subgrade preparation, selection of satisfactory materials, placement and compaction of all structural fill.

b) Sufficient notification prior to stripping and earthwork construction is essential to make certain that the work will be adequately observed and tested.

8.3 Slab-on-Grade

a) Concrete floor slabs may be founded on the compacted fill.

b) A 2-inch thick SAND layer should be placed below slab-on-grade. 10-mil thick plastic vapor barrier is recommended to be installed below the SAND.

c) It is recommended that #3 bars on 18-inch on center or equivalent, both ways, be provided as minimum reinforcement in slabs-on-grade. Joints should be provided and slabs should be at least 4 inches thick. Slab supporting vehicular traffic should be at least 6 inches thick and reinforced with #4 bars on 12 inches on center.

d) The slab should be dowelled into the footings by #4 bars at a maximum spacing of 24 inches.

e) The FFL should be at least 6 inches above highest adjacent grade.

f) The subgrade should be kept moist prior to the concrete pour.

8.4 Spread Foundations

The proposed structures can be founded on shallow spread footings. The criteria presented as follows should be adopted:

8.4.1 Dimensions/Embedment Depths

Number of Stories (floors supported)	Minimum Width (ft)	Minimum Footing Thickness (in)	Minimum Embedment Below Lowest Finished Grade (ft)	
1	1.0	7	Perimeter	1.5
			Interior	1.0
Square Column Footings To 100 kip	2.0	1.0	2.0	

8.4.2 Allowable Bearing Capacity

Embedment Depth (ft)	Allowable Bearing Capacity (lb/ft^2)
1.0	2,000

(Notes:

- The allowable bearing capacity may be increased by 600 lb/ft^2 for each additional foot increase in the depth and by 200 lb/ft^2 for each additional foot increase in the width, to a maximum value of 4,000 $lb/ft^{2;}$
- These values may be increased by one-third in the case of short-duration loads, such as induced by wind or seismic forces;
- At least 4x#4 bars should be provided in wall footings, two on top and two at the bottom;
- Any pad footings should be tied at least in two directions by grade beams;
- In the event that footings are founded in structural fills consisting of imported materials, the allowable bearing capacities will depend on the type of these materials, and should be re-evaluated;

- Bearing capacities should be re-evaluated when loads have been obtained and footings sized during the preliminary design;

- Planter areas should not be sited adjacent to walls;

- Footing excavations should be observed by the Geotechnical Engineer. The subgrade should be kept moist prior to the concrete pour;

- It should be insured that the embedment depths do not become reduced or adversely affected by erosion, softening, planting, digging, etc.)

8.4.3 Settlements

Total and differential settlements under spread footings are expected to be within tolerable limits and are not expected to exceed 1 inch and ¾ inches over a horizontal distance of 40 feet, respectively.

8.5 Lateral Pressures

a) The following lateral pressures are recommended for the design of retaining structures.

Lateral Force	**Soil Profile**	**Pressure (lb/ft^2/ft depth)**	
		Unrestrained Wall	**Rigidly Supported Wall**
Active Pressure	Level	34	-
At-Rest Pressure	Level	-	55
Passive Resistance (ignore upper 1.5 ft.)	Level	300	-

b) Friction coefficient: 0.37 for soil (includes a Factor of Safety of 1.5).

c) These values apply to the backfill using the existing soils.

d) Backfill should be placed under engineering control.

e) Subdrains comprised of 4-inch perforated (holes facing downward) Schedule 40, SDR-35 or equivalent PVC pipe covered in a minimum of one cubic foot per linear foot of filter rock and wrapped in Mirafi 140N filter fabric should be provided behind retaining walls. In the absence of the subdrain, higher pressure should be utilized to design the retaining walls.

8.6 Seismic Coefficients

a) For seismic analysis of the proposed project in accordance with the ASCE 7-10 Standard, we recommend the following:

ITEM	VALUE
Site Longitude (Decimal-degrees)	-116.9664
Site Latitude (Decimal-degrees)	33.9280
Site Class	D
Seismic Design Category	D
Mapped Spectral Response Acceleration-Short Period (0.2 Sec) - S_S	1.500
Mapped Spectral Response Acceleration-1 Second Period – S_1	0.620
Short Period Site Coefficient-F_a	1.0
Long Period Site Coefficient F_v	1.5
Adjusted Spectral Response Acceleration @ 0.2 Sec. Period (Sms)	1.500
Adjusted Spectral Response Acceleration @ 1Sec.Period (S_{m1})	0.931
Design Spectral Response Acceleration @ 0.2 Sec. Period (S_{Ds})	1.000
Design Spectral Response Acceleration @ 1-Sec. Period (S_{D1})	0.620

b) Due to the absence of shallow free groundwater and presence of dense soils, the potential for liquefaction is considered low.

8.7 Pavement

8.7.1 Asphalt Pavement Section

a) Based on Traffic Indices (T.I.) and on the anticipated "R"-Value of 42, the following tentative structural pavement sections are recommended.

Location	T.I.	Asphaltic Concrete (inches)	Aggregate Base (inches)
Parking	5.0	3	4
Access Road	6.0	3	6

b) At the conclusion of grading operations, the subgrade soils should be tested to verify the R-Value.

8.7.2 Subgrade Preparation

All pavement areas shall be inspected, tested for compaction requirements, reworked where required and approved immediately prior to the placement of aggregate base. Subgrade soils within the upper 12 inches of finished grade shall be moisture-conditioned where necessary, shall be compacted to at least 90 percent relative compaction per ASTM D1557, and shall be free of any loose or soft areas.

8.7.3 Base Preparation

Unless otherwise specified, the base shall consist of Class II ¾-inch aggregate base or Crushed Miscellaneous Base (CMB). The base shall be compacted to a minimum of 95 percent relative compaction in accordance with the procedures described in ASTM Test Method D1557.

8.8 Corrosion Potential

a) Soil Corrosion potential for metal and concrete was estimated by performing water-soluble sulfate, chloride, pH, and electrical resistivity tests during our prior investigation.

b) Electrical resistivity is a measure of soil resistance to the flow of corrosion currents. Corrosion currents are generally high in low resistivity soils. The electrical resistivity of a soil decreases primarily with an increase in its chemical and moisture contents.

c) A commonly accepted correlation between electrical resistivity and corrosivity for buried ferrous metals is presented below:

Electrical Resistivity, Ohm-cm	**Corrosion Potential**
Less than 1,000	Severe
1,000-2,000	Corrosive
2,000-10,000	Moderate
Greater than 10,000	Mild

d) Results of electrical resistivity test indicate a value of 4,018 ohm-cm for the near-surface soils. Based on this data, it is our opinion that, in general, on-site near-surface soils are considered *moderately corrosive* in nature. This potential should be considered in design of underground metal pipes.

9. LIMITATIONS

a) Soils and bedrock over an area show variations in geological structure, type, strength and other properties from what can be observed, sampled and tested from specimens extracted from necessarily limited exploratory borings. Therefore, there are natural limitations inherent in making geologic and soil engineering studies and analyses. Our findings, interpretations, analyses and recommendations are based on observation, laboratory data and our professional experience; and the projections we make are professional judgments conforming to the usual standards of the profession. No other warranty is herein expressed or implied.

b) In the event that during construction, if the conditions are exposed which are significantly different from those described in this report, they should be brought to the attention of the Geotechnical Engineer.

c) The recommendations provided in this report are intended to minimize the potential of distress to the structures caused by compressible soils. However, it should be noted that certain amount of settlement of the structures is unavoidable and should be anticipated during the lifetime of the existing and the proposed structures.

The opportunity to be of service is sincerely appreciated. If you have any questions or if we can be of further assistance, please call.

Very truly yours,

GLOBAL GEO-ENGINEERING, INC.

Mohan B. Upasani
Principal Geotechnical Engineer
RGE 2301
(Exp. March 31, 2019)

Kevin B. Young
Principal Engineering Geologist
CEG 2253
(Exp. October 31, 2019)

MBU/KBY: fdg

Enclosures:

Location Map	- Figure 1
Seismicity Map	- Figure 2
Terms and Conditions	
References	- Appendix A
Field Exploration	- Appendix B
Unified Soils Classification System	Figure B-1
Logs of Boring	Figures B-2 through B-6
Boring Location Plan	Figure B-7
Laboratory Testing	- Appendix C

TERMS AND CONDITIONS

Consultant shall serve Client by providing professional counsel and technical advice regarding subsurface conditions consistent with the scope of services agreed-to between the parties. Consultant will use his professional judgment and will perform his services using that degree of care and skill ordinarily exercised under similar circumstances, by reputable foundation engineers and/or engineering geologists practicing in this or similar localities.

- In assisting Client, the Consultant may include or rely on information and drawings prepared by others for the purpose of clarification, reference or bidding; however, by including the same, the Consultant assumes no responsibility for the information shown thereon and Client agrees that Consultant is not responsible for any defects in its services that result from reliance on the information and drawings prepared by others. Consultant shall not be liable for any incorrect advice; judgment or decision based on any inaccurate information furnished by the Client or any third party, and Client will indemnify Consultant against claims, demands, or liability arising out of, or contribute to, by such information.

- Unless otherwise negotiated in writing, Client agrees to limit any and all liability, claim for damages, cost of defense, or expenses to be levied against Consultant on account of design defect, error, omission, or professional negligence to a sum **not to exceed ten thousand dollars or charged fees whichever is less**. Further, Client agrees to notify any construction contractor or subcontractor who may perform work in connection with any design, report, or study prepared by Consultant of such limitation of liability for design defects, errors, omissions, or professional negligence, and require as a condition precedent to their performing the work a like limitation of liability on their part as against the Consultant. In the event the Client fails to obtain a like limitation of liability provision as to design defects, errors, omissions or professional negligence, any liability of the Client and Consultant to such contractor or subcontractor arising out of a negligence shall be allocated between Client and Consultant in such a manner that the aggregate liability of Consultant for such design defects to all parties, including the Client shall **not exceed ten thousand dollars or charged fees whichever is less**. No warranty, expressed or implied of merchantability or fitness, is made or intended in connection with the work to be performed by Consultant or by the proposal for consulting or other services or by the furnishing of oral or written reports or findings made by Consultant.

- The Client agrees, to the fullest extent permitted by law, to indemnify, defend and hold harmless the Consultant, its officers, directors, employees, agents and subconsultants from and against all claims, damages, liabilities or costs, including reasonable attorney's fees and defense costs, of any nature whatsoever arising from or in connection with the Project to the extent that said claims, damages, liabilities or costs arise out of the work, services, or conduct of Client or Client's contractors, subconsultants, or other third party not under Consultant's control. Client further agrees that the duty to defend set forth herein arises immediately and is not contingent on a finding of fault against Client or Client's contractors, subconsultants, or other third parties. Client shall not be obligated under this provision to indemnify Consultant for Consultant's sole negligence or willful misconduct.

- Client shall grant free access to the site for all necessary equipment and personnel and Client shall notify any and all possessors of the project site that Client has granted Consultant free access to the project site at no charge to Consultant unless expressly agreed to otherwise in writing.

- If Client is not the property owner for the subject Project, Client agrees that it will notify the property owner of the terms of this agreement and obtain said property owner's approval to the terms and conditions herein. Should Client fail to obtain the property owner's agreement as required herein, Client agrees to be solely responsible to Consultant for all damages, liabilities, costs, including litigation fees and costs, arising from such failure that exceed that limitation of Consultant's liability herein.

- Client shall locate for Consultant and shall assume responsibility for the accuracy of his representations as to the locations of all underground utilities and installations. Consultant will not be responsible for damage to any such utilities or installation not so located.

- Client and Consultant agree to waive claims against each other for consequential damages arising out of or relating to this agreement. Neither party to this agreement shall assign the contract without the express, written consent of the other party.

- Consultant agrees to cover all open test holes and place a cover to carry a 200-pound load on each hole prior to leaving project site unattended. Consultant agrees that all test holes will be backfilled upon completion of the job. However, Client may request test holes to remain open after completion of Consultants work. In the event Client agrees to pay for all costs associated with covering and backfilling said test holes at a later date, and Client shall indemnify, defend and hold harmless Consultant for all claims, demands and liabilities arising from his request, except for the sole negligence of the Consultant, to the extent permitted by law.

- Consultant shall not be responsible for the general safety on the job or for the work of Client, other contractors and third parties.

- Consultant shall be excused for any delay in completion of the contract caused by acts of God, acts of the Client or Client's agent and/or contractors, inclement weather, labor trouble, acts of public utilities, public bodies, or inspectors, extra work, failure of Client to make payments promptly, or other contingencies unforeseen by Consultant and beyond reasonable control of the Consultant.

- In the event that either party desires to terminate this contract prior to completion of the project, written notification of such intention to terminate must be tendered to the other party. In the event Client notifies Consultant of such intention to terminate Consultant's services prior to completion of the contract, Consultant reserves the right to complete such analysis and records as are necessary to place files in order, to dispose of samples, put equipment in order, and (where considered necessary to protect his professional reputation) to complete a report on the work performed to date. In the event that Consultant incurs cost in Client's termination of this Agreement, a termination charge to cover such cost shall be paid by Client.

- If the Client is a corporation, the individual or individuals who sign or initial this Contract, on behalf of the Client, guarantee that Client will perform its duties under this Contract. The individual or individuals so signing or initialing this Contract warrant that they are duly authorized agents of the Client.

- Any notice required or permitted under this Contract may be given by ordinary mail at the address contained in this Contract, but such address may be changed by written notice given by one party to the other from time to time. Notice shall be deemed received in the ordinary course of the mail. This agreement shall be deemed to have been entered into the County of Orange, State of California.

LIMITATIONS

Our findings, interpretations, analyses, and recommendations are professional opinions, prepared and presented in accordance with generally accepted professional practices and are based on observation, laboratory data and our professional experience. Consultant does not assume responsibility for the proper execution of the work by others by undertaking the services being provided to Client under this agreement and shall in no way be responsible for the deficiencies or defects in the work performed by others not under Consultant's direct control. No other warranty herein is expressed or implied.

APPENDIX A

References

1. Blake, T. F., 2000, *EQFAULT: A Computer Program for the Deterministic Prediction of Peak Horizontal Acceleration from Digitized California Fault*, User Manual and Program;

2. Boore, D.M., Joyner, W.B., and Fumal, T.E., 1997, *Equations for the Estimating Horizontal Response Spectra and Peak Acceleration from Western North American Earthquakes: A Summary of Recent Work*: Seismological Research Letters, Vol. 68, No. 1, pp. 128-153;

3. California Department of Water Resources, Retrieved September 21, 2018, *Water Data Library, Historical Data Map Inter*face (Internet);

4. Dibblee, T.W. and Minch J.A., 2003, *Geologic Map of the Beaumont Quadrangle, Riverside County, California*, Dibblee Foundation Map DF-114;

5. Hart, Eart W., Revised 1997, *Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps*: California Division of Mines and Geology Special Publication 42;

6. United States Geological Survey, Earthquake Hazards Program, U.S. Seismic Design Maps Application, ASCE 7-10 Standard;

7. United States Geological Survey, 1996, Beaumont Quadrangle, 7.5-Minute Topographic Series.

APPENDIX B

Field Exploration

a) The site was explored on August 29, 2018 utilizing a truck mounted hollow stem auger rig to excavate five borings to a maximum depth of 30 feet below the existing ground surface. Borings P-1 and P-2 were utilized for percolation testing. Borings B-1 through B-3 were subsequently backfilled. The soils encountered in the borings were logged and sampled by our Engineering Geologist. The soils were classified in accordance with the Unified Soil Classification System described in *Figure B-1*. The Logs of Boring are presented in *Figures B-2* through *B-6*. The approximate locations of the drilled borings are shown on the *Boring Location Plan, Figure B-7*. The logs, as presented, are based on the field logs, modified as required from the results of the laboratory tests. Driven ring and bulk samples were obtained from the excavations for laboratory inspection and testing. The depths at which the samples were obtained are indicated on the logs.

b) The number of blows of the hammer during sampling was recorded, together with the depth of penetration, the driving weight and the height of fall. The blows required per foot of penetration for given samples are indicated on the logs. These blow counts provide a measure of the density and consistency of the soil.

c) No ground water or seepage was encountered in any of the boring excavations

d) Caving occurred as noted on the boring logs.

APPENDIX C

Laboratory Testing Program

The laboratory testing program in our investigation was directed towards providing quantitative data relating to the relevant engineering properties of the soils. Samples considered representative of site conditions were tested as described below. Laboratory test results from the prior investigations are also shown below.

a) Moisture-Density

Moisture-density information usually provides a gross indication of soil consistency. Local variations at the time of the investigation can be delineated, and a correlation obtained between soils found on this site and nearby sites. The dry unit weights and field moisture contents were determined for selected samples. The results are shown on the *Logs of Borings.*

b) Compaction

A representative soil sample was tested in the laboratory to determine the maximum dry density and optimum moisture content, using the ASTM D1557 compaction test method. This test procedure requires 25 blows of a 10-pound hammer falling a height of 18 inches on each of five layers, in a 1/30 cubic foot cylinder. The results of the tests are shown below:

Boring No.	**Sample Depth (ft)**	**Soil Description**	**Optimum Moisture Content (%)**	**Maximum Dry Density (lb/ft^3)**
B-1	1-3	Silty SAND	9.3	127.3

c) Direct Shear

Direct shear tests were conducted on relatively undistiurbed samples, using a direct shear machine at a constant rate of strain in accordance with ASTM test Method D3080. Variable normal or confining loads are applied vertically and the soil shear strengths are obtained at these loads. The angle of internal friction and the cohesion are then evaluated. The samples were tested at saturated moisture contents. The test results are shown in terms of the Coulomb shear strength parameters, as shown below:

Boring No.	Sample Depth (ft)	Soil Description	Coulomb Cohesion (lb/ft^2)	Angle of Internal Friction (°)	Peak/ Residual
B-1	2	Silty SAND	150 150	29 29	Peak Ultimate

c) Sulfate Content

A representative soil sample was analyzed for its sulphate content in accordance with California Test Method CA417. The results are given below:

Boring No.	Sample Depth (ft)	Soil Description	Sulphate Content (%)
B-1	1-3	Silty SAND	0.0037

d) Chloride Content

A representative soil sample was analyzed for chloride content in accordance with California Test Method CA422. The results are given below:

Boring No.	Sample Depth (ft)	Soil Description	Chloride Content (%)
B-1	1-3	Silty SAND	0.0032

e) Resistivity and pH

A representative soil sample was analyzed in accordance with California Test Methods CA532 and CA643 to determine the minimum resistivity and pH. The result is provided below:

Boring No.	Sample Depth (ft)	Soil Description	Minimum Resistivity (ohm-cm)	pH
B-1	1-3	Silty SAND	4,018	7.9

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

<u>Santa Ana Watershed</u> - BMP Design Volume, V_{BMP} (Rev. 10-2011)	Legend:	Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: SPB Engineering — Date: 1/30/2022
Designed by: Michael St. Jacques — Case No:
Company Project Number/Name: Beaumont-Carwash, Gas Station & Convenience Store

BMP Identification

BMP NAME / ID: Underground Detention Chambers

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E — D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D/1A	*44523*	*Roofs*	*1*	*0.89*	*39714.5*			
D/1B	*9159*	*Natural (C Soil)*	*0.3*	*0.23*	*2062.3*			
	53682	***Total***			**41776.8**	**0.85**	***2959.2***	***3372***

Notes:

DYODS™
Design Your Own Detention System

CONTECH CMP DETENTION SYSTEMS

CONTECH CONSTRUCTION PRODUCTS INC.

For design assistance, drawings,
and pricing send completed worksheet to:
dyods@contech-cpi.com

Project Summary

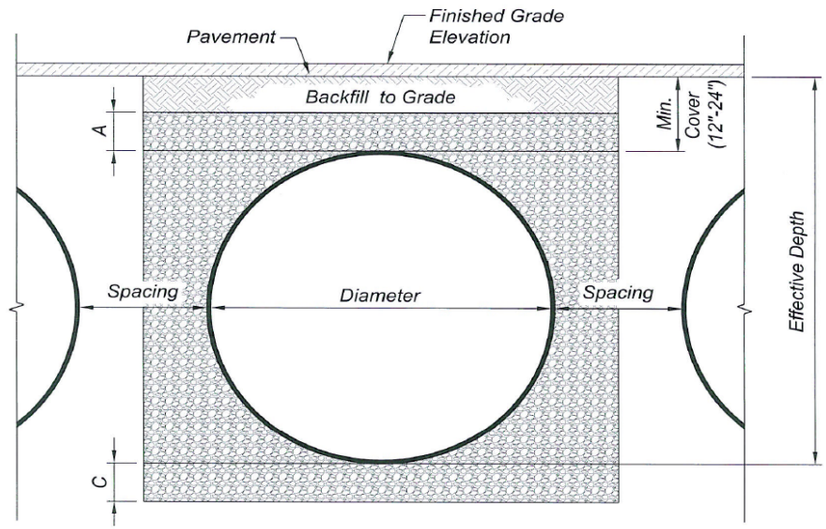
Date:	1/21/2022
Project Name:	Beaumont
City / County:	City of Beaumont
State:	CA
Designed By:	Michael St. Jacques
Company:	SPB Engineering, Inc
Telephone:	

Enter Information in Blue Cells

Corrugated Metal Pipe Calculator

Storage Volume Required (cf):	3,351
Limiting Width (ft):	16.00
Invert Depth Below Asphalt (ft):	5.00
Solid or Perforated Pipe:	Solid
Shape Or Diameter (in):	36
Number Of Headers:	0
Spacing between Barrels (ft):	1.50
Stone Width Around Perimeter of System (ft):	0.75
Depth A: Porous Stone Above Pipe (in):	12
Depth C: Porous Stone Below Pipe (in):	12
Stone Porosity (0 to 40%):	40

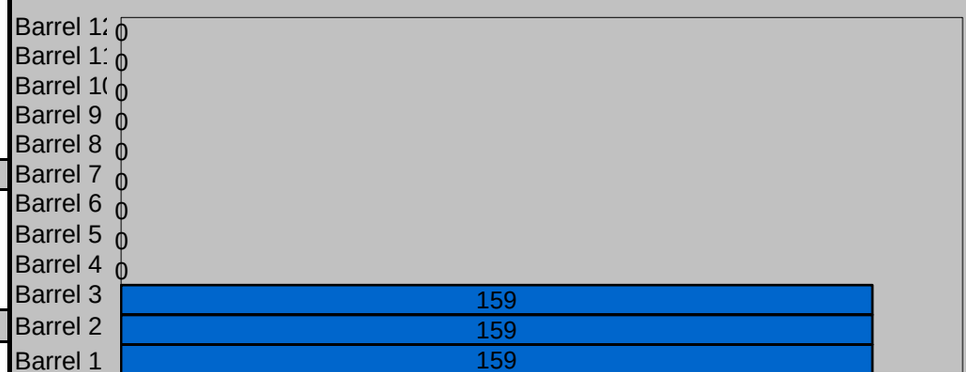
7.07 ft^2 Pipe Area



System Sizing

Pipe Storage:	3,372	cf	
Porous Stone Storage:	0	cf	
Total Storage Provided:	3,372	cf	100.6% Of Required Storage
Number of Barrels:	3	barrels	
Length per Barrel:	159.0	ft	
Length Per Header:	0.0	ft	
Rectangular Footprint (W x L):	13.5 ft x 160.5 ft		

System Layout



Barrel Footage (w/o headers)

CONTECH Materials

Total CMP Footage:	477	ft
Approximate Total Pieces:	21	pcs
Approximate Coupling Bands:	18	bands
Approximate Truckloads:	3	trucks

Construction Quantities**

Total Excavation:	402	cy
Porous Stone Backfill For Storage:	0	cy stone
Backfill to Grade Excluding Stone:	277	cy fill

***Construction quantities are approximate and should be verified upon final design*

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/22/22 File:4.out

Existing 2-Year Storm

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6475

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.589(In/Hr)
Slope of intensity duration curve = 0.5300

++
Process from Point/Station 100.000 to Point/Station 150.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 341.000(Ft.)

Top (of initial area) elevation = 2600.300(Ft.)
Bottom (of initial area) elevation = 2595.100(Ft.)
Difference in elevation = 5.200(Ft.)
Slope = 0.01525 s(percent)= 1.52
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.610 min.
Rainfall intensity = 1.347(In/Hr) for a 2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.646
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 71.60
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.045(CFS)
Total initial stream area = 1.200(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 1.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/22/22 File:4.out

Existing 10-Year Storm

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6475

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.890(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 100.000 to Point/Station 150.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 341.000(Ft.)
Top (of initial area) elevation = 2600.300(Ft.)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/22/22 File:4.out

Existing 100-Year Storm

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6475

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.320(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 100.000 to Point/Station 150.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 341.000(Ft.)
Top (of initial area) elevation = 2600.300(Ft.)

Bottom (of initial area) elevation = 2595.100(Ft.)
Difference in elevation =   5.200(Ft.)
Slope =   0.01525 s(percent)=   1.52
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.610 min.
Rainfall intensity =   3.017(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 94.40
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff =   3.175(CFS)
Total initial stream area =   1.200(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =   1.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

Bottom (of initial area) elevation = 2595.100(Ft.)
Difference in elevation =   5.200(Ft.)
Slope =   0.01525 s(percent)=   1.52
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.610 min.
Rainfall intensity =   2.034(In/Hr) for a   10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.813
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff =   1.985(CFS)
Total initial stream area =   1.200(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =   1.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/22/22
File:BeaumontProposed.out

Proposed 2-Year Storm

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6475

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.589(In/Hr)
Slope of intensity duration curve = 0.5300

++
Process from Point/Station 200.000 to Point/Station 225.000
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   341.500(Ft.)
Top (of initial area) elevation =   602.350(Ft.)
Bottom (of initial area) elevation =   600.310(Ft.)
Difference in elevation =     2.040(Ft.)
Slope =    0.00597  s(percent)=       0.60
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.614 min.
Rainfall intensity =      1.649(In/Hr) for a     2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.701(CFS)
Total initial stream area =        1.200(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      225.000 to Point/Station      250.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =   599.690(Ft.)
Downstream point/station elevation =   598.790(Ft.)
Pipe length  =    90.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.701(CFS)
Given pipe size =      6.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     7.367(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      8.267(Ft.)
 Minor friction loss =      0.000(Ft.)  K-factor =   0.00
Pipe flow velocity =      8.66(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     8.79 min.
End of computations, total study area =            1.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  69.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/22/22
File:BeaumontProposed.out

Proposed 10-Year Storm

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6475

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.890(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 200.000 to Point/Station 225.000
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   341.500(Ft.)
Top (of initial area) elevation =   602.350(Ft.)
Bottom (of initial area) elevation =   600.310(Ft.)
Difference in elevation =     2.040(Ft.)
Slope =    0.00597  s(percent)=       0.60
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.614 min.
Rainfall intensity =      2.490(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.637(CFS)
Total initial stream area =        1.200(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      225.000 to Point/Station      250.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------
Upstream point/station elevation =   599.690(Ft.)
Downstream point/station elevation =   598.790(Ft.)
Pipe length  =    90.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.637(CFS)
Given pipe size =      6.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
    18.967(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =     19.867(Ft.)
 Minor friction loss =      0.000(Ft.)  K-factor =   0.00
Pipe flow velocity =     13.43(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =     8.73 min.
End of computations, total study area =            1.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  69.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/22/22
File:BeaumontProposed.out

Proposed 100-Year Storm

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6475

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.320(In/Hr)
Slope of intensity duration curve = 0.5300

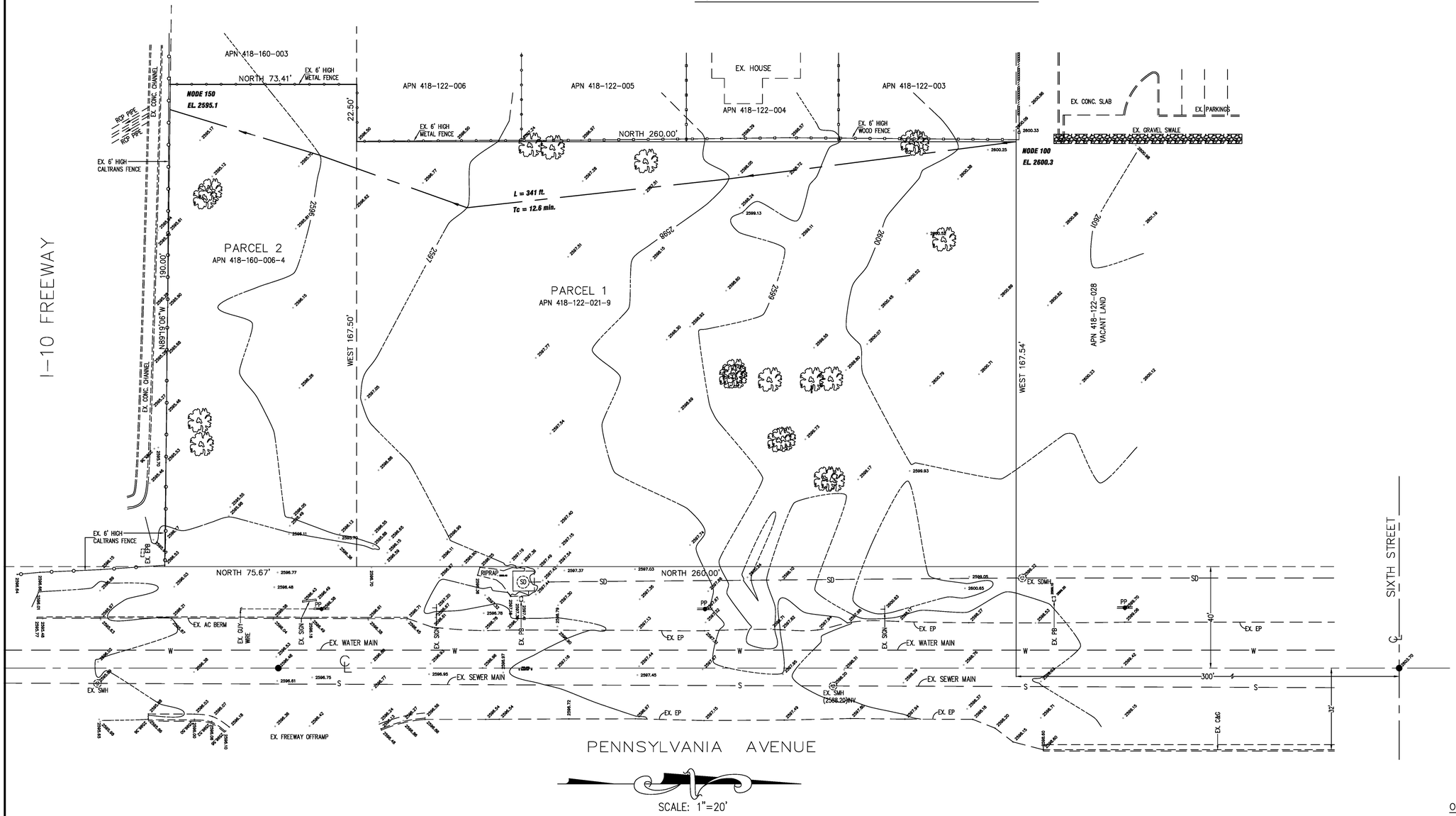
++
Process from Point/Station 200.000 to Point/Station 225.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 341.500(Ft.)

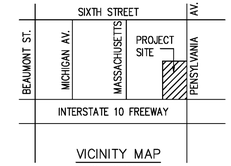
```
Top (of initial area) elevation =   602.350(Ft.)
Bottom (of initial area) elevation =   600.310(Ft.)
Difference in elevation =     2.040(Ft.)
Slope =    0.00597  s(percent)=       0.60
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.614 min.
Rainfall intensity =      3.693(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.894
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  84.40
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      3.963(CFS)
Total initial stream area =        1.200(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      225.000 to Point/Station      250.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =   599.690(Ft.)
Downstream point/station elevation =   598.790(Ft.)
Pipe length  =    90.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.963(CFS)
Given pipe size =      6.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
    43.980(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =     44.880(Ft.)
 Minor friction loss =      0.000(Ft.)  K-factor =   0.00
Pipe flow velocity =     20.18(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     8.69 min.
End of computations, total study area =            1.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  69.0
```

EXISTING

N/W COR. PENSYLVANIA AVE. & 10 FRWY



SCALE: 1"=20'



VICINITY MAP
NOT TO SCALE

LEGEND

FLOWLINE OR SLOPE DIRECTION

LIMIT OF DEVELOPMENT

TABLE 1: PRE-DEVELOPMENT				
EVENT YEAR	Q	C	I	A
10	1.985	0.813	2.034	1.20
100	3.040	0.840	3.017	1.20

OWNER/DEVELOPER

JSI PROPERTY HOLDING, INC.
9484 SHERWOOD DRIVE
RANCHO CUCAMONGA, CA. 91737
CONTACT PERSON: LAKHBIR SONDH
PHONE: (626) 224-4636
EMAIL: jas_sondh@hotmail.com

PLAN PREPARED BY

SPB ENGINEERING, INC.
1391 WINDEMERE LANE
TUSTIN, CA. 92780
PHONE: (714) 931-0912
EMAIL: fiji1961@gmail.com

PREPARED UNDER THE SUPERVISION OF:

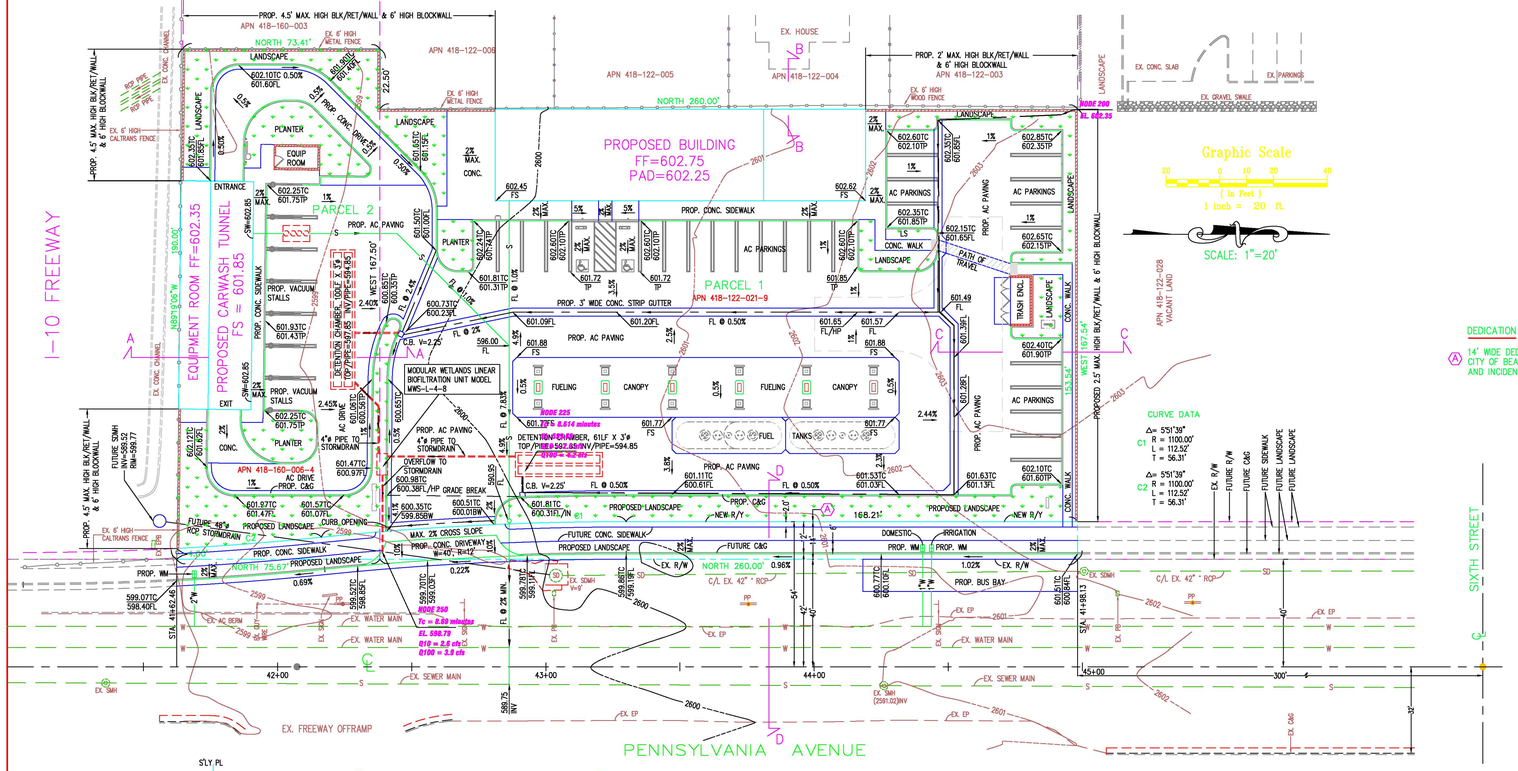
05-12-21
DATE

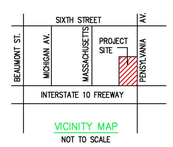
MICHAEL P. ST. JACQUES
R.C.E. 66815 EXPIRES 09-30-22

REGISTERED PROFESSIONAL ENGINEER
MICHAEL P. ST. JACQUES
No. C066815
Exp.09-30-22
CIVIL
STATE OF CALIFORNIA

PROPOSED HYDROLOGY

N/W COR. PENSYLVANIA AVE. & 10 FRWY





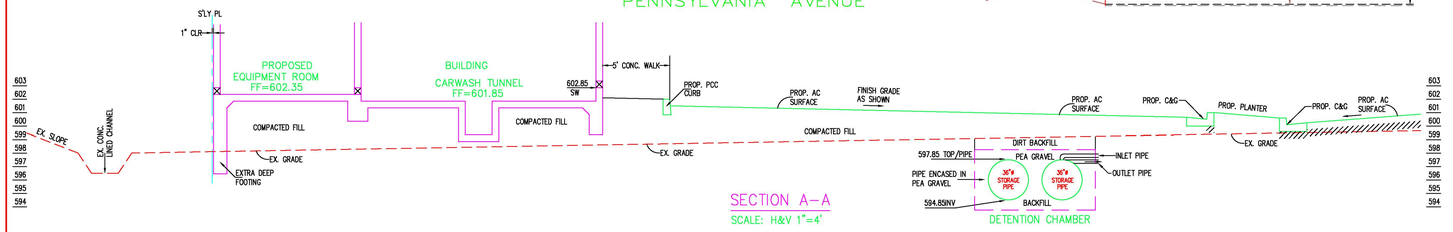
VICINITY MAP
NOT TO SCALE

LEGEND

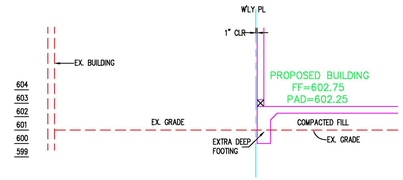
- LANDSCAPE
- STAMPED CONCRETE
- DIRT/EARTH MATERIAL
- ADA PATH OF TRAVEL
- NEW LIGHTS
- AC REMOVE & REPLACE
- AC 2" GRIND & OVERLAY
- FLOWLINE OR SLOPE DIRECTION
- DRAIN INLET/CATCH BASIN
- ROOF DRAINS
- DRAINAGE BOUNDARY

TABLE 2: POST-DEVELOPMENT

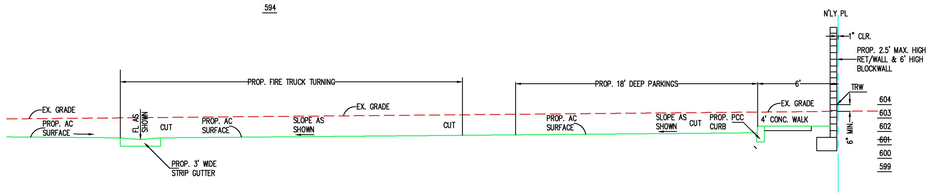
EVENT YEAR	Q	C	I	A
10	2.6	0.883	2.490	1.20
100	3.9	0.887	3.693	1.20



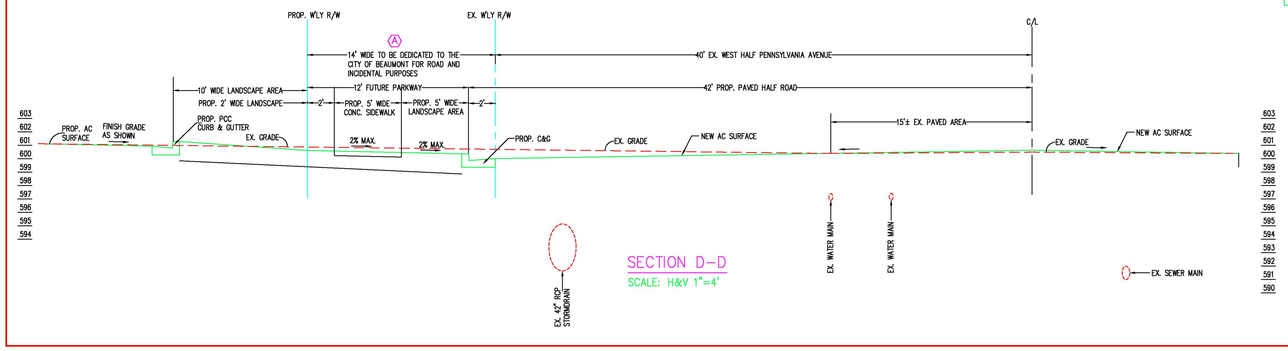
SECTION A–A
SCALE: H&V 1"=4'



SECTION B–B
SCALE: H&V 1"=4'



SECTION C–C
SCALE: H&V 1"=4'

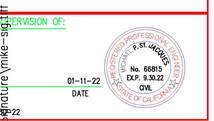


SECTION D–D
SCALE: H&V 1"=4'

OWNER/DEVELOPER
JSI PROPERTY HOLDING, INC.
9484 SHERWOOD DRIVE
RANCHO CUCAMONGA, CA. 91737
CONTACT PERSON: LAKHBIR SONDH
PHONE: (626) 224-4635
EMAIL: jss_sondh@hotmail.com

PLAN PREPARED BY
SPB ENGINEERING, INC.
1391 WINDEMERE LANE
TUSTIN, CA. 92780
PHONE: (714) 931-0912
EMAIL: flj1961@gmail.com

PREPARED UNDER THE SUPERVISION OF:



01-11-22
DATE

MICHAEL P. ST. JACQUES
R.C.E. 66815 EXPIRES 09-30-22

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Source Control BMPs

Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	Operational BMPs—Include in WQMP Table and Narrative
☒ A. On-site storm drain inlets	☒ Locations of inlets.	☒ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	☒ Maintain and periodically repaint or replace inlet markings. ☒ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☒ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☒ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
☐ B. Interior floor drains and elevator shaft sump pumps		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ C. Interior parking garages		☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ D1. Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.
☒ D2. Landscape/ Outdoor Pesticide Use	☒ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☒ Show self-retaining	State that final landscape plans will accomplish all of the following. ☒ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☒ Design landscaping to minimize	☒ Maintain landscaping using minimum or no pesticides. ☒ See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at

	landscape areas, if any. ☒ Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ☒ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ☒ Consider using pest-resistant plants, especially adjacent to hardscape. ☒ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	http://rcflood.org/stormwater/Error! Hyperlink reference not valid. ☒ Provide IPM information to new owners, lessees and operators.
☐ E. Pools, spas, ponds, decorative fountains, and other water features.	☐ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☐ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ F. Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.

	discharging to the sanitary sewer.		
☒ G. Refuse areas	☒ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☒ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent runon and show locations of berms to prevent runoff from the area. ☒ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	☒ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☒ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☒ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
☐ H.Industrial processes.	☐ Show process area.	☐ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/
☐ I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	☐ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent runon or run-off from area. ☐ Storage of non-hazardous liquids shall be covered by a	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous	☐ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

	roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ☐ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Materials Programs for: ? Hazardous Waste Generation ? Hazardous Materials Release Response and Inventory ? California Accidental Release (CalARP) ? Aboveground Storage Tank ? Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ? Underground Storage Tank www.cchealth.org/groups/hazmat/	
☒ J. Vehicle and Equipment Cleaning	☒ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shutoff to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.	☐ If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ☒ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater ☐ Car dealerships and similar may rinse cars with water only.

	(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.		
☐ K. Vehicle/Equipment Repair and Maintenance	☐ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ☐ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ☐ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	☐ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ☐ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ☐ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ☐ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ☐ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ☐ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants

			categories below. Brochure can be found at http://rcflood.org/stormwater/
☐ L. Fuel Dispensing Areas	☐ Fueling areas[6] shall have impermeable floors (i.e., Portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
☐ M. Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

	drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		
☐ N. Fire Sprinkler Test Water		☐ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☐ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☒ Rooftop equipment ☐ Drainage sumps ☒ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☒ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.	

		☒ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. ☐ Include controls for other sources as specified by local reviewer.	
☒ P. Plazas, sidewalks, and parking lots.			☒ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

TO BE ADDED TO FINAL WQMP

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

TO BE ADDED TO FINAL WQMP