Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

U-Stor-It Sorrento Valley

Permit Application Number _____

Drawing Number _____, I.O. Number _____

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

Patric de Boer

Provide Wet Signature and Stamp Above Line

Prepared For:

Chicago Capitol Funds, LLC

501 W. Broadway STE 2020

San Diego, CA 92121

Prepared By:

Omega Engineering Consultants
4340 Viewridge Ave, Suite B
San Diego, CA 92113
(858) 634-8620

Date:

07/12/2022

Approved by: City of San Diego Date

The City of SAN DIEGO

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: U-Stor-It Sorrento Valley

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

Project Name: U-Stor-It Sorrento Valley

Certification Page

Project Name:
Permit Application

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Engineer of Work's Signature

83583 — PE#

03/03/2023 — Expiration Date

Patric T. de Boer

Print Name

Omega Engineering Consultants

Company

7/20/2022

Date

Engineer's Stamp

Project Name: U-Stor-It Sorrento Valley

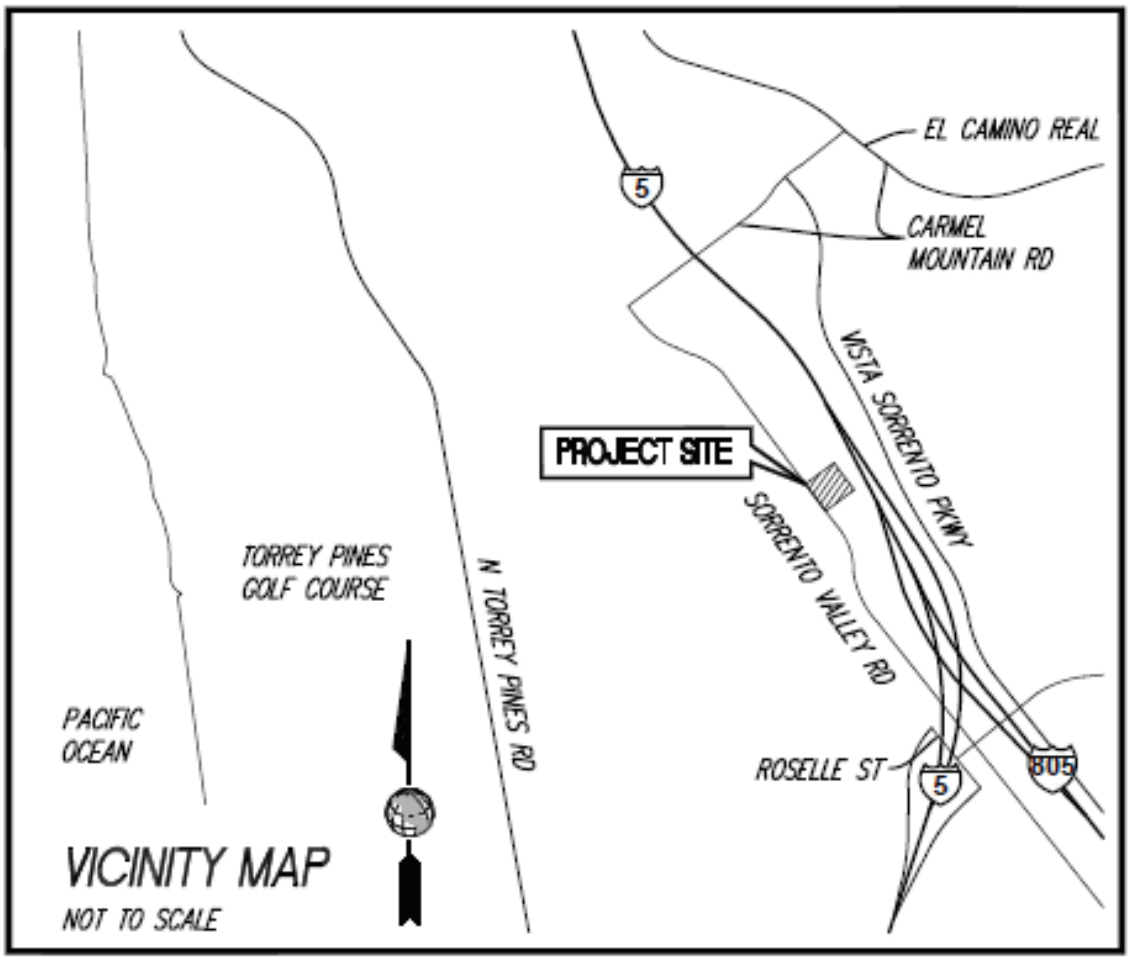
Submittal Record

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments.

Submittal Number	Date	Project Status	Changes
1	09/28/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Initial Submittal
2		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
3		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

Project Vicinity Map

Project Name: U-Stor-It Sorrento Valley
Permit Application TBD



City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Development Services

THE CITY OF SAN DIEGO

FORM
DS-560
July 2021

Storm Water Requirements Applicability Checklist

Project Address:

U-Stor-It Sorrento Valley

Project Number:

TBD

SECTION 1: Construction Storm Water BMP Requirements

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Regional Water Quality Control Board.

For all projects, complete Part A - If project is required to submit a SWPPP or WPCP, continue to Part B

PART A – Determine Construction Phase Storm Water Requirements

1. Is the Project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ◉ Yes, SWPPP required; skip questions 2-4 ○ No; proceed to next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with storm water?

   ○ Yes, SWPPP required; skip questions 3-4 ◉ No; proceed to next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   ○ Yes, SWPPP required; skip question 4 ◉ No; proceed to next question

4. Does the project only include the following Permit types listed below?

   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb, and gutter replacement, and retaining wall encroachments.

   ☐ Yes, no document required

Check one of the boxes below and continue to Part B

◉ **If you checked "Yes" for question 1**, an SWPPP is REQUIRED – **continue to Part B**

○ **If you checked "No" for question 1 and checked "Yes" for question 2 or 3**, a WPCP is REQUIRED. If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to Part B**

○ **If you check "No" for all questions 1-3 and checked "Yes" for question 4,** Part B does not apply, and no document is required. **Continue to Section 2.**

[1] More information on the City's construction BMP requirements as well as CGP requirements can be found at http://www.sandiego.gov/stormwater/regulations/index.shtml

CLEAR FORM

PART B – Determine Construction Site Priority

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete Part B and continue to Section 2

☐ **1. ASBS**

A. Projects located in the ASBS watershed

☑ **2. High Priority**

A. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and not located in the ASBS watershed
B. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and not located in the ASBS watershed.

☐ **3. Medium Priority**

A. Projects that are not located in an ASBS watershed or designated as a High priority site.
B. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and not located in an ASBS watershed
C. WPCP projects (>5,000 sf of ground disturbance) located within the Los Peñasquitos watershed management area

☐ **4. Low Priority**

A. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

Section 2: Construction Storm Water BMP Requirements

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C – Determine if Not Subject to Permanent Storm Water Requirements

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

- **If "yes" is checked for any number in Part C**: Proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".
- **If "no" is checked for all of the numbers in Part C:** Continue to Part D.

1. Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?

   ○ Yes ◉ No

2. Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?

   ○ Yes ◉ No

3. Does the project fall under routine maintenance? Examples include but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).

   ○ Yes ◉ No

CLEAR FORM

PART D – PDP Exempt Requirements

PDP Exempt projects are required to implement site design and source control BMPs.

- **If "yes" is checked for any questions in Part D**, continue to Part F and check the box labeled "PDP Exempt."
- **If "no" is checked for all questions in Part D**, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

PART E – Determine if Project is a Priority Development Project (PDP)

Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

- **If "yes" is checked for any number in Part E**, continue to Part F and check the box labeled "Priority Development Project".
- **If "no" is checked for every number in Part E**, continue to Part F and check the box labeled "Standard Development Project."

1. **New development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ○ Yes ◉ No

2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ◉ Yes ○ No

3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replaces 5,000 square feet or more of impervious surface. ○ Yes ◉ No

4. **New development or redevelopment on a hillside.** The project creates and/or replaces5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ○ Yes ◉ No

5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).** ○ Yes ◉ No

6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site). ○ Yes ◉ No

CLEAR FORM

7. **New development or redevelopment discharging directly to an environmentally sensitive area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ○ Yes ◉ No

8. **New development or redevelopment projects of retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ○ Yes ◉ No

9. **New development or redevelopment projects of an automotive repair shop that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ○ Yes ◉ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ○ Yes ◉ No

PART F – Select the appropriate category based on the outcomes of Part C through Part E

1. The project is **NOT SUBJECT TO PERMANENT STORM WATER REQUIREMENTS** ○ Yes ◉ No

2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ○ Yes ◉ No

3. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management. ◉ Yes ○ No

Name of Owner or Agent

Rogelio Ruiz

Title

Staff Engineer

Signature

Rogelio Ruiz

Date

08/25/2021

CLEAR FORM

Applicability of Permanent, Post-Construction Storm Water BMP Requirements	Form I-1

Project Identification

Project Name: U-Stor-It Sorrento Valley	
Permit Application Number: TBD	Date: 08/25/2021

Determination of Requirements

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with **Step 1** and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to **Step 2**.
	☐ No	**Stop**. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or PDP Exempt? To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.	☐ Standard Project	**Stop.** Standard Project requirements apply
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to **Step 3**.
	☐ PDP Exempt	**Stop.** Standard Project requirements apply. Provide discussion and list any additional requirements below.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Project Name: U-Stor-It Sorrento Valley

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to **Step 4**.
	☑ No	BMP Design Manual PDP requirements apply. Go to **Step 4**.
Discussion / justification of prior lawful approval, and identify requirements (not required if prior lawful approval does not apply): N/A		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to **Step 5**.
	☐ No	**Stop**. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). **Stop**.
	☑ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. **Stop**.
Discussion / justification if protection of critical coarse sediment yield areas does not apply: The project does not drain to CCSYA areas. There are no CCSYA that drain through the site. See CCSYA Exhibit for more details.		

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody. Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

PROJECT IS NOT HMP EXEMPT. CALCULATIONS AND DMA SHEET ARE PROVIDED IN ATTACHMENT 1

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: U-Stor-It Sorrento Valley

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	U-Stor-It Sorrento Valley
Project Address	11391 Sorrento Valley Rd. San Diego, CA 92121
Assessor's Parcel Number(s) (APN(s))	310-070-29
Permit Application Number	TBD
Project Watershed	Select One: ☐ San Dieguito River ☑ Penasquitos ☐ Mission Bay ☐ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	906.10
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	1.46 Acres (63,781 Square Feet)
Area to be disturbed by the project (Project Footprint)	1.46 Acres (63,871 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	1.226 Acres (53,408 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.223 Acres (9,724 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	-1.78 %

Project Name: U-Stor-It Sorrento Valley

Form I-3B Page 2 of 11

Description of Existing Site Condition and Drainage Patterns

Current Status of the Site (select all that apply):

☑ Existing development
☐ Previously graded but not built out
☐ Agricultural or other non-impervious use
☐ Vacant, undeveloped/natural

Description / Additional Information:

The existing development consists of a single-story commercial building and asphalt parking lot. The site is currently 85% impervious with a general slope of 1% and 5%.

Existing Land Cover Includes (select all that apply):

☐ Vegetative Cover
☐ Non-Vegetated Pervious Areas
☑ Impervious Areas

Description / Additional Information:

The impervious areas consist of a commercial building and asphalt parking lot. The pervious area consist of landscape along the existing building.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

☐ NRCS Type A
☐ NRCS Type B
☐ NRCS Type C
☑ NRCS Type D

Approximate Depth to Groundwater:

☐ Groundwater Depth < 5 feet
☐ 5 feet < Groundwater Depth < 10 feet
☐ 10 feet < Groundwater Depth < 20 feet
☑ Groundwater Depth > 20 feet

Groundwater expected at 30 feet below ground surface, per Geotechnical Report

Existing Natural Hydrologic Features (select all that apply):

☐ Watercourses
☐ Seeps
☐ Springs
☐ Wetlands
☑ None

Description / Additional Information:

N/A

Form I-3B Page 3 of 11

Description of Existing Site Topography and Drainage

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1. Whether existing drainage conveyance is natural or urban;
2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site;
3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;
4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Descriptions/Additional Information

1. The existing drainage conveyance is urban and consists of surface flow along the existing parking lot and rooftops.

2. Approximately 0.42 cfs drain from the southerly neighboring property drain towards the onsite parking lot via surface flow. Also, approximately 1470 SF of offsite landscape located along the easterly boundary line drain towards the onsite parking lot via surface flow.

3. The existing project site has no permanent storm drain system conveyance network. The entire site drains via sheet flow from east to west towards the gutter on Sorrento Valley Road.

4. The project drains out of the site in a single flow path.

The offsite runoff generated by the southerly property drains via an asphalt swale into the onsite parking lot where it comingles with onsite flow. The portion of landscape on the easterly boundary line sheet flows to the onsite flow on the onsite parking lot.

The entire site drains from the easterly portion of the site towards the westerly driveway via surface flow. The runoff then drains to the gutter on Sorrento Valley Road. This point is referred to as Discharge Point # 1 in this report.

Existing Discharge Point # 1, 100-Year flow: 8.46 cfs

Form I-3B Page 4 of 11

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:

The project proposes to demolish and remove the existing development and a construct a self-storage facility with two-stories above grade and three subterrenean levels. The proposed improvements include a lined biofiltration facility, storm drain system, driveways and the self-storage facility. The lined biofiltration facility will be located along the frontage of the property and will discharge on the gutter on Sorrento Valley Road.

Off-site street improvements include the driveways, sidewalk, curb and gutter and landscape.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

The impervious features of the site consist of building roof, driveways, drive aisles and hardscape. The building roof will occupy the majority of the site.

List/describe proposed pervious features of the project (e.g., landscape areas):

The pervious features of the site consist of the lined biofiltration basin and landscape.

Does the project include grading and changes to site topography?

☑ Yes

☐ No

Description / Additional Information:

Form I-3B Page 5 of 11

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☑ Yes

☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Description / Additional Information:

The runoff generated from the westerly portion of the roof from the self-storage facility will drain towards the west directly to a lined biofiltration basin. The northerly and easterly portions of the site will drain to a series of grated inlets along the gutter on the northerly drive aisle. The collected stormwater will drain via pipe flow to a 36-inch precast box inside the lined biofiltration facility. The southerly portion of the site will drain via gutter flow on the southerly drive aisle into a trench drain that will be connected to the lined biofiltration basin. The biofiltration facility is sized for treatment and hydromodification purposes. After treatment, the stormwater discharges to the gutter on Sorrento Valley Road via a curb outlet. This point is referred as Discharge Point # 1 in this report.

The offsite flow generated by the southerly property will be bypassed via a brow ditch along the southerly property line and drain on a F-type catch basin, thence to a curb outlet and ultimately on the gutter along Sorrento Valley Rd. The offsite flow travels north approximately 180 feet towards Discharge Point # 1.

The existing conditions has a 100-year confluenced flow of 8.46 cfs. The proposed conditions has a 100-year confluenced flow of 8.45 cfs.

Form I-3B Page 6 of 11

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

- [x] Onsite storm drain inlets
- [x] Interior floor drains and elevator shaft sump pumps
- [x] Interior parking garages
- [x] Need for future indoor & structural pest control
- [x] Landscape/outdoor pesticide use
- [ ] Pools, spas, ponds, decorative fountains, and other water features
- [ ] Food service
- [ ] Refuse areas
- [ ] Industrial processes
- [ ] Outdoor storage of equipment or materials
- [ ] Vehicle and equipment cleaning
- [ ] Vehicle/equipment repair and maintenance
- [ ] Fuel dispensing areas
- [ ] Loading docks
- [x] Fire sprinkler test water
- [ ] Miscellaneous drain or wash water
- [x] Plazas, sidewalks, and parking lots

Description/Additional Information:

Form I-3B Page 7 of 11

Identification and Narrative of Receiving Water

Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)

The runoff generated by the site drains towards a curb inlet approximately 0.32 miles north on Sorrento Valley Rd., thence to Los Penasquitos Creek, thence to Los Penasquitos Lagooon and ultimately to the Pacific Ocean.

Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations

Los Penasquitos Lagoon: BIOL, EST, MAR, MIGR, RARE, REC1, REC2, SHELL, WILD
Pacific Ocean: AQUA, BIOL, COMM, IND, MAR, MIGR, NAV, RARE, REC1. REC2, SHELL, SPWN, WILD

Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations

There are no ASBS receiving waters downstream of the project's discharge locations.

Provide distance from project outfall location to impaired or sensitive receiving waters

The project's outfall location is approximately adjacent to Los Penasquitos Creek which drains to Los Penasquitos Lagoon, the sensitive receiving water.

Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands

The site propose a permanent post-construction biofiltration BMP. The site's discharge point lies approximately 0.15 miles downstream of City owned MHPA areas identified by the City of San Diego General Plan Conservation Element.

Project Name: U-Stor-It Sorrento Valley

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body (Refer to Appendix K)	**Pollutant(s)/Stressor(s) (Refer to Appendix K)**	**TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)**
Los penasquitos Lagoon	Sedimentation/Siltation	Estimated Completion 2019

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):			
Pollutant	**Not Applicable to the Project Site**	**Anticipated from the Project Site**	**Also a Receiving Water Pollutant of Concern**
Sediment	☐	☑	☑
Nutrients	☐	☑	☐
Heavy Metals	☐	☑	☐
Organic Compounds	☑	☐	☐
Trash & Debris	☐	☑	☐
Oxygen Demanding Substances	☑	☐	☐
Oil & Grease	☐	☑	☐
Bacteria & Viruses	☑	☐	☐
Pesticides	☑	☐	☐

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6)?

☑ Yes, hydromodification management flow control structural BMPs required.

☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

N/A

Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.

Critical Coarse Sediment Yield Areas*
*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☐ Yes

☑ No

Discussion / Additional Information:

The project is located approximately 500 feet southwesterly from the nearest CCSYA area, however, the CCSYA area does not drain through the site. See attached CCSYA exhibit.

Form I-3B Page 10 of 11

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**

List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.

The site has one point of compliance for flow control for this site. Stormwater is discharged at the frontage of the property through a curb outlet, this point being the point of compliance.

Has a geomorphic assessment been performed for the receiving channel(s)?

☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold)

☐ Yes, the result is the low flow threshold is $0.1Q_2$

☐ Yes, the result is the low flow threshold is $0.3Q_2$

☐ Yes, the result is the low flow threshold is $0.5Q_2$

If a geomorphic assessment has been performed, provide title, date, and preparer:

N/A

Discussion / Additional Information: (optional)

N/A

Form I-3B Page 11 of 11

Other Site Requirements and Constraints

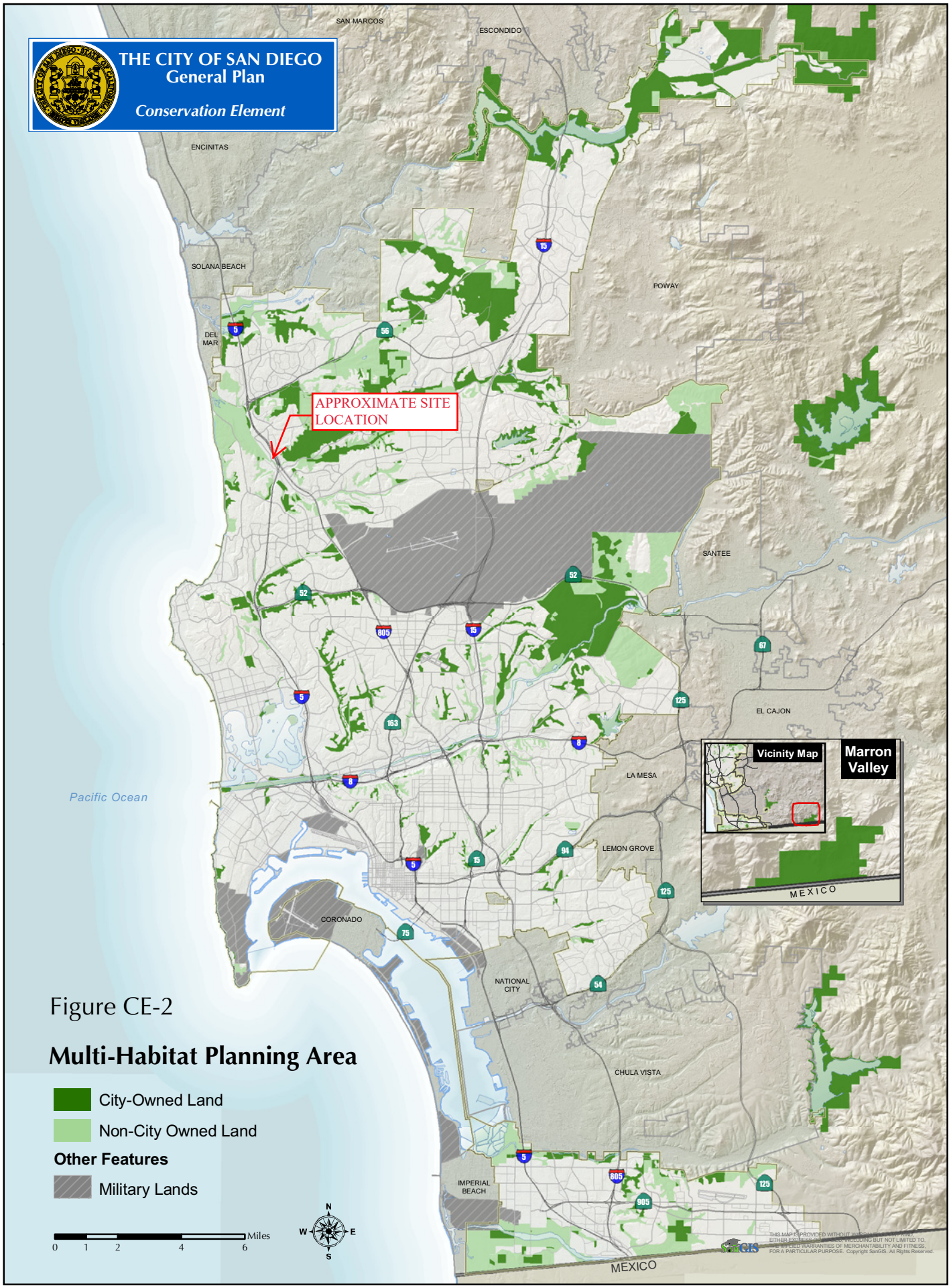
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

The soil type is assumed to be Soil Type D which constrains the infiltration feasibility of the BMP. The Biofiltration will be underlain with a impermeable liner to prevent infiltration.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

N/A


THE CITY OF SAN DIEGO
General Plan
Conservation Element
SAN MARCOS
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
SANTEE
EL CAJON
LA MESA
LEMON GROVE
NATIONAL CITY
CORONADO
CHULA VISTA
IMPERIAL BEACH
APPROXIMATE SITE LOCATION
Pacific Ocean
Vicinity Map
Marron Valley
MEXICO
MEXICO
Figure CE-2
Multi-Habitat Planning Area
City-Owned Land
Non-City Owned Land
Other Features
Military Lands
Miles
0 1 2 4 6
N
W E
S

Project Name: U-Stor-It Sorrento Valley

Source Control BMP Checklist for PDPs	Form I-4B

Source Control BMPs

All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.3 not implemented: No outdoor material storage proposed.			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.4 not implemented: No outdoor storage areas proposed.			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Project Name: U-Stor-It Sorrento Valley

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☑ Yes	☐ No	☐ N/A
Interior parking garages	☑ Yes	☐ No	☐ N/A
Need for future indoor & structural pest control	☑ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☑ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☑ N/A
Plazas, sidewalks, and parking lots	☐ Yes	☐ No	☑ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Project Name: U-Stor-It Sorrento Valley

Site Design BMP Checklist for PDPs	Form I-5B

Site Design BMPs

All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.1 not implemented: No natural drainage pathways on-site.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☑ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.2 not implemented: No natural areas or vegetation exist on-site.			

Project Name: U-Stor-It Sorrento Valley

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented: The site is designed to utilize the minimum areas required for their intended use. The proposed site reduces the impervious area by 192 SF compared to the existing conditions.			
4.3.4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented: Soil compaction will be minimized on landscape areas and location of biofiltration facility.			
4.3.5 Impervious Area Dispersion	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.5 not implemented: No areas with sufficient length exist to use impervious area dispersion.			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☑ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☑ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: U-Stor-It Sorrento Valley

Form I-5B Page 3 of 4				
Site Design Requirement		Applied?		
4.3.6 Runoff Collection		☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.6 not implemented: No areas with sufficient area and soil exist for proper implementation of runoff collection.				
6a-1	Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2	Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1	Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6b-2	Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species		☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:				
4.3.8 Harvest and Use Precipitation		☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.8 not implemented: The proposed site is a multi-story self-storage facility that will present a low demand for harvested rainwater. The low demand does not justify implementing harvesting and use of precipitation, see Attachment 1e.				
8-1	Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
8-2	Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: U-Stor-It Sorrento Valley

Form I-5B Page 4 of 4
Insert Site Map with all site design BMPs identified:
SEE DMA MAP FOR SITE DESIGN BMPS

Project Name: U-Stor-It Sorrento Valley

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

For the purposes of the design infiltration rates, a soil type D has been assumed on this site. As a result, full or partial infiltration has been deemed infeasible in the site. We chose to use a fully lined biofiltration basin to treat the entire site runoff. The biofiltration basin (BMP-1) has a soil filtration layer that will serve the purpose of pollutant control and a proposed outlet orifice will serve to meet the hydromodification requirements. See the DMA Sheet in Attachment 1A for more details. The basin was designed using the requirements shown in the City of San Diego BMP Design Manual Appendix E.13 (BF-1 Fact Sheet), and SWMM 5.1 EPA hydrologic modeling program. The proposed cross-section, size and other basin details can be found on the DMA Sheet in Attachment 1A.

(Continue on page 2 as necessary.)

Project Name: U-Stor-It Sorrento Valley

Form I-6 Page 2 of

(Continued from page 1)

Project Name: U-Stor-It Sorrento Valley

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP-1	
Construction Plan Sheet No. TBD	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☑ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Andrew J. Kann Omega Engineering Consultants (858) 634-8620
Who will be the final owner of this BMP?	Property Owner
Who will maintain this BMP into perpetuity?	Property Owner
What is the funding mechanism for maintenance?	Property Owner

Project Name: U-Stor-It Sorrento Valley

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BMP-1
Construction Plan Sheet No. TBD
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

	City of San Diego **Development Services** 1222 First Ave., MS-501 San Diego, CA 92101	**Permanent BMP Construction** **Self Certification Form**	**FORM** **DS-563** **December 2016**

Date Prepared: 08/25/2021	Project No./Drawing No.: TBD
Project Applicant: Patric de Boer	Phone: (858) 634-8620
Project Address: 11391 Sorrento Valley Rd., San Diego, CA 92121	
Project Name: U-Stor-It Sorrento Valley	

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Standards Manual documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for Priority Development Projects in order to comply with the City's Storm Water ordinances and applicable San Diego Regional MS4 Permit. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

Certification:

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control, hydromodification, and treatment control BMP's required per the Storm Water Standards Manual; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and San Diego Regional MS4 Permit.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: _____

Date of Signature: _____

Printed Name: Patric de Boer

Title: _____

Phone No. (858) 634-8620

Engineer's Stamp

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: U-Stor-It Sorrento Valley

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☑ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☑ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

Project Name: U-Stor-It Sorrento Valley

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

- [x] Underlying hydrologic soil group
- [x] Approximate depth to groundwater
- [x] Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- [ ] Critical coarse sediment yield areas to be protected
- [x] Existing topography and impervious areas
- [x] Existing and proposed site drainage network and connections to drainage offsite
- [x] Proposed grading
- [x] Proposed impervious features
- [x] Proposed design features and surface treatments used to minimize imperviousness
- [x] Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- [ ] Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- [x] Structural BMPs (identify location, type of BMP, size/detail, and include cross-section)

Tabular Summary of DMAs								Worksheet B-1	
DMA Unique Identifier	Area (acres)	Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient	DCV (cubic feet)	Treated By (BMP ID)	Pollutant Control Type	Drains to (POC ID)
DMA-1	0.68	0.60	88	D	0.84	1006	BMP-1	BMP-1	POC-1
DMA-2	0.72	0.63	87	D	0.83	1081	BMP-1	BMP-1	POC-1
DMA-3	0.004	0	0	D	0.35	-	-	De-minimis	POC-1
DMA-4	0.05	0	0	D	0.35	31	-	Self-Mitigating	POC-1

Summary of DMA Information (Must match project description and SWQMP Narrative)									
No. of DMAs	Total DMA Area (acres)	Total Impervious Area (acres)	% Imp		Area Weighted Runoff Coefficient	Total DCV (cubic feet)	Total Area Treated (acres)		No. of POCs
4	1.45	1.23	85		0.82	2145	1.45		POC-1

Where: DMA = Drainage Management Area; Imp = Imperviousness; HSG = Hydrologic Soil Group; DCV= Design Capture Volume; BMP = Best Management Practice; POC = Point of Compliance; ID = identifier; No. = Number

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.5	inches
2	Area tributary to BMP (s)	A=	1.40	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.83	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	2104	cubic-feet

Sizing Method for Pollutant Removal Criteria		Worksheet B.5-1	
1	Area draining to the BMP	60,826	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.83	
3	85th percentile 24-hour rainfall depth	0.50	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	2104	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	16.8	inches
15	Total Depth Treated [Line 13 + Line 14]	46.8	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	3156	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	809	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	1578	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	1127	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	1515	sq. ft.
22	Footprint of the BMP = Maximum (Minimum (Line 17, Line 19), Line 21)	1515	sq. ft.
23	Provided BMP Footprint	1600	sq. ft.
24	Is Line 23 ≥ Line 22? If Yes, then footprint criterion is met. If No, increase the footprint of the BMP.	○ Yes	◉ No

Sizing Method for Volume Retention Criteria		Worksheet B.5-2	
1	Area draining to the BMP	60,826	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.83	
3	85th percentile 24-hour rainfall depth	0.50	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	2104	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5/ Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	48.4	cu. ft.

Volume Retention for No Infiltration Condition						Worksheet B.5-6	
1	Area draining to the biofiltration BMP					60,826	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)					0.83	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]					50,486	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]					1,515	sq. ft.
5	Biofiltration BMP Footprint					1,600	sq. ft.
Landscape Area (must be identified on DS-3247)							
	Identification	**A**	**B**	**C**	**D**	**E**	
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)						
7	Impervious area draining to the landscape area (sq. ft.)						
8	Impervious to Pervious Area ratio [Line 7/Line 6]						
9	Effective Credit Area If Line 8 >1.5, use Line 6; if not use Line 7/1.5						
10	Sum of Landscape area [sum of Lines 9A-9E]						sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]				1,600		sq. ft.
Volume Retention Performance Standard							
12	Is Line 11 ≥ Line 4? If yes, then volume retention performance standard for no infiltration condition is met. If no, proceed to Line 13					○ Yes ○ No	
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]					1.06	
14	Target Volume Retention [Line 10 from Worksheet B.5.2]					48.4	cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]					-2.9	cu. ft.
Site Design BMP							
	Identification	**Site Design Type**				**Credit**	
16	**A**						cu. ft.
	B						cu. ft.
	C						cu. ft.
	D						cu. ft.
	E						cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Lines 16A-16E] Provide documentation of how the site design credit is calculated in the PDP SWQMP.					0	cu. ft.
17	Is Line 16 ≥ Line 15? If yes, then volume retention performance standard for no infiltration condition is met. If no, implement additional site design BMPs.					◉ Yes ○ No	

Worksheet B.3-1: Harvest and Use Feasibility Screening

Harvest and Use Feasibility Screening	Worksksheet B.3-1

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?
   - ☒ Toilet and urinal flushing
   - ☒ Landscape irrigation
   - ☐ Other:_____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

Office: 7 gallons per day * 1.5 days per 36 hours
Demand = 10.5 Gal/36 hours
Landscaping: 390 Gal*(0.19 Ac*36 hours).
Demand = 74 Gal/36 hours
Total Demand (Gal): 84.5 Gal/36 hours
Total Demand (CF): 11.3 CF/36 hours

3. Calculate the DCV using worksheet B-2.1.
[Provide a results here]

DCV = 2,118 (cubic feet)

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
Yes / No ⇨	Yes / No ⇨	Yes ⇩
⇩	⇩	
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Note: 36-hour demand calculations are for feasibility analysis only, once the feasibility analysis is complete the applicant may be allowed to use a different drawdown time provided they meet the 80 percent of average annual (long term) runoff volume performance standard.

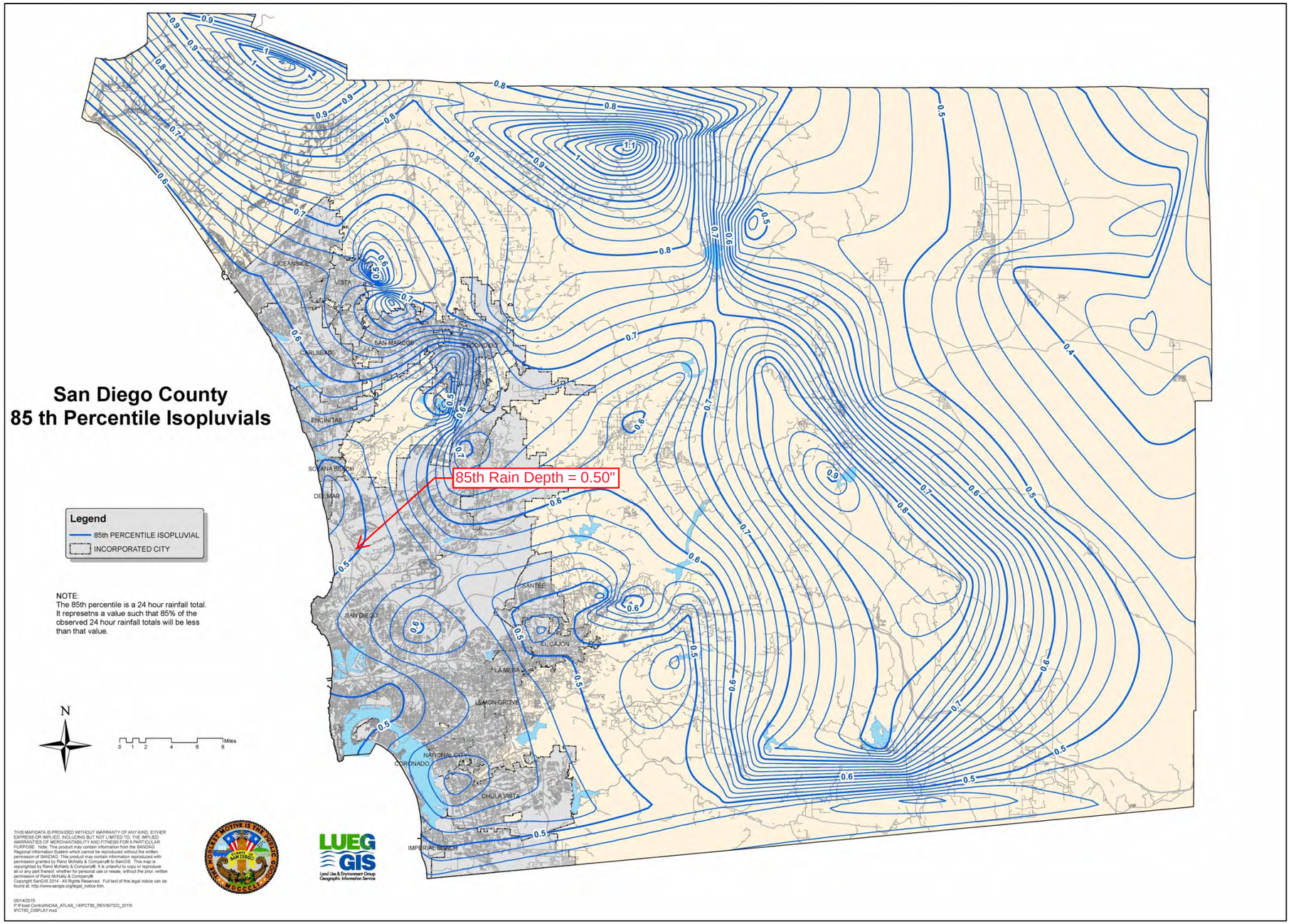
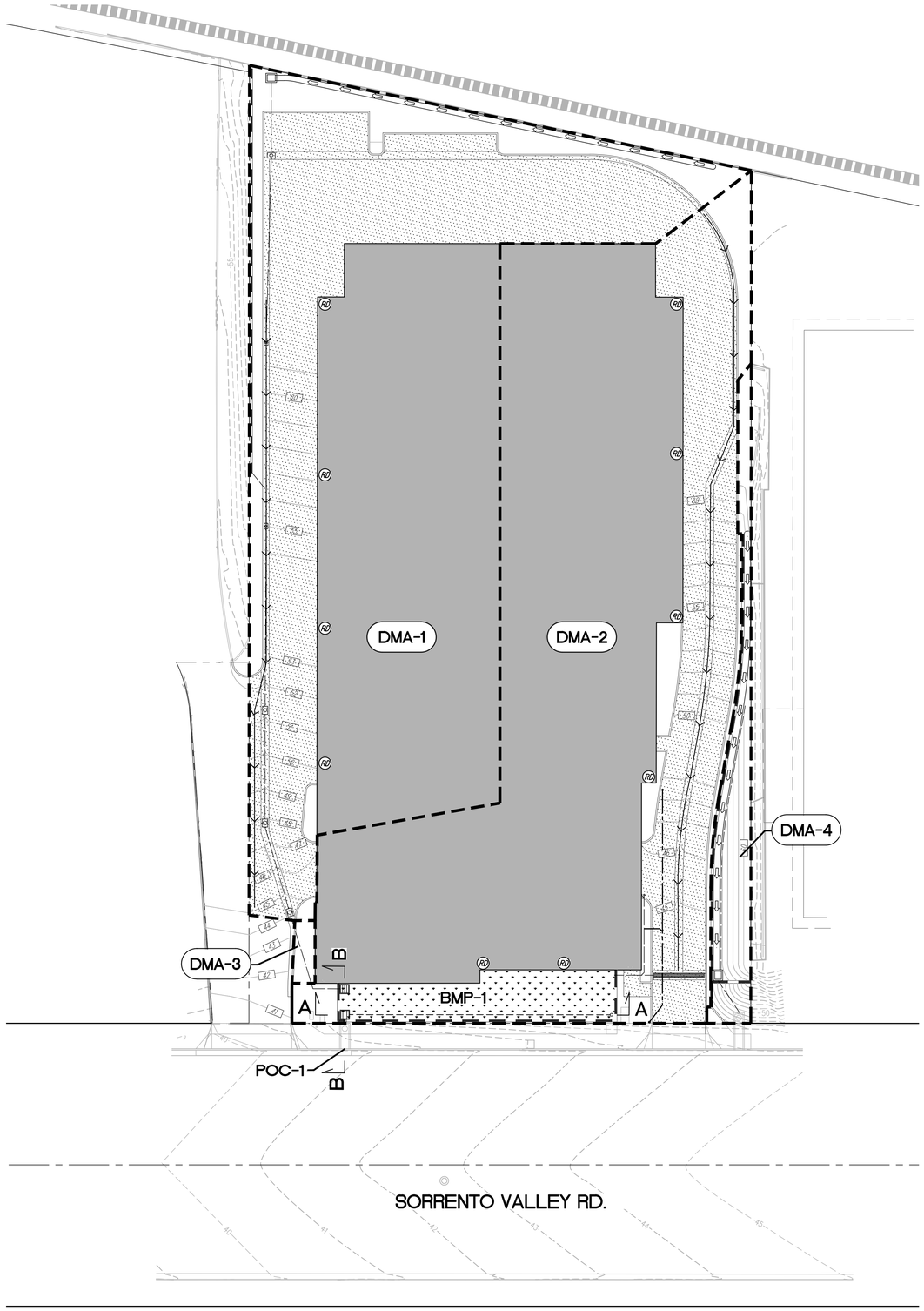


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

DMA PLAN

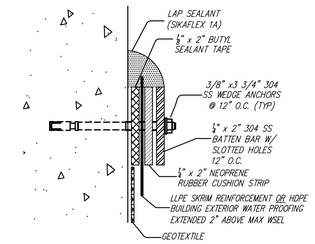


DMA DATA TABLE				
DMA-NO.	TOT. AREA (SF)	IMPERVIOUS (%)	DESIGN DCV (CF)	TYPE/TREATED BY
DMA-1	29,565	88	1,006	BMP-1
DMA-2	31,261	87	1,081	BMP-1
DMA-3	192	0	–	DE-MINIMIS
DMA-4	2,114	0	31	SELF-MITIGATING

TREATMENT BMP DATA TABLE				
BMP-#	TREATING	REQUIRED FOOTPRINT	PROPOSED FOOTPRINT	DESCRIPTION
BMP-1	DMA-1	1,515 SF	1,600 SF	LINED BIOFILTRATION W/ 1/2" LOW FLOW ORIFICE

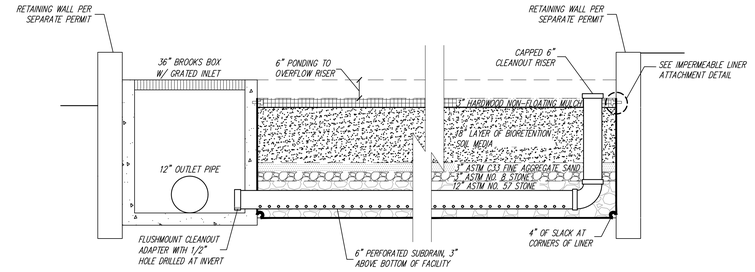
LEGEND:

- DMA BOUNDARY
- DRAINAGE ARROWS
- DRAINAGE MANAGEMENT AREA — DMA-#
- POINT OF COMPLIANCE — POC-#
- STRUCTURAL BEST MANAGEMENT PRACTICE — BMP-#
- IMPERVIOUS AREA
- ROOF AREA
- BIO AREA
- LANDSCAPED AREAS



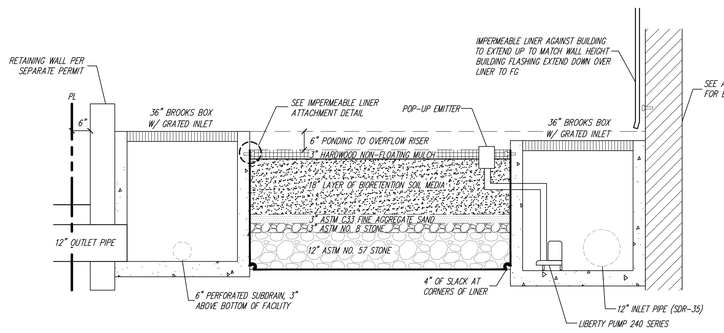
IMPERMEABLE LINER ATTACHMENT DETAIL

NOT TO SCALE



BMP-1, BIORETENTION FACILITY SECTION A-A [A]

NOT TO SCALE



BMP-1, BIORETENTION FACILITY SECTION B-B [B]

NOT TO SCALE

NOTE

INLET BOX IS CONFIGURED IN A "BUBBLER" CONFIGURATION. THIS MEANS THAT WATER ENTERS FROM THE PIPE AND FLOWS UP OUT OF THE GRATE. THE PUMP IS ONLY INTENDED TO EMPTY THE BOX AFTER RAIN EVENTS TO PREVENT STANDING WATER. IT DOES NOT EFFECT THE TREATMENT CAPACITY, STORAGE VOLUME, OR FLOWRATES THAT THE BMP RECEIVED. AS SUCH, IT IS NOT INCLUDED IN THE HMP ANALYSIS OR HYDROLOGY CALCULATIONS.

BIOFILTRATION LINER NOTES

ROLL WIDTH TO BE NO LESS THAN 20 FT AND LENGTH TO BE NO LESS THAN 100 FT TO MINIMIZE THE REQUIRED SEAMS.

CONTRACTOR SHALL VERIFY SUITABILITY OF SELECTED PRODUCT WITH CIVIL ENGINEER PRIOR TO PURCHASE.

BIOFILTRATION INSPECTION SCHEDULE NOTES

CONTRACTOR MUST CONTACT ENGINEER FOR INSPECTION OF BMPS AT THE FOLLOWING STAGES OF CONSTRUCTION:

- –PRIOR TO START OF CONSTRUCTION OF BIOFILTRATION AREA
- –PRIOR TO CONSTRUCTION OF OUTLET STRUCTURES
- –AFTER GRADING OF BASIN AREA
- –AFTER KEY GRADING, PRIOR TO KEY INSTALLATION OF LINER
- –AFTER PLACEMENT OF IMPERMEABLE LINER (W/ EXTRA LENGTHS)
- –AFTER PLACEMENT OF SUBDRAIN
- –AFTER THE PLACEMENT OF GRAVEL DRAINAGE LAYER
- –AFTER PLACEMENT OF TREATMENT SOIL
- –AFTER IRRIGATION AND LANDSCAPING ACTIVITES

*SURVEY STAKES SHALL BE AVAILABLE FOR EACH INSPECTION
**WATER TEST SHALL BE REQUIRED AT DISCRETION OF ENGINEER OF RECORD (6 HR WATER TEST DURATION WITH CONTRACTOR ON STANDBY)

SOURCE CONTROL BMP NOTES

ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE UTILIZED

- A. ALL ONSITE INLETS TO BE MARKED "NO DUMPING" OR SIMILAR AND ALL OPERATIONAL PRECAUTIONS TO AVOID NON STORM WATER DISCHARGE SHALL BE FOLLOWED PER THE CITY'S BMP DESIGN MANUAL.
- B. PROPOSED REFUSE AREA WILL REMAIN COVERED AND PROTECTED FROM WIND DISPERSAL. SIGNS SHALL BE PLACED WITH WORDS "DO NOT DUMP HAZARDOUS MATERIALS OR LIQUIDS HERE" OR SIMILAR. OWNER SHALL BE RESPONSIBLE TO KEEP THE AREA CLEAN OF LITTER AND SPILLS.
- C. OWNER TO BE RESPONSIBLE FOR SWEEPING PLAZAS, SIDEWALKS, AND PARKING LOTS. THIS IS TO BE DONE REGULARLY AND AS NEEDED TO PREVENT ACCUMULATION OF LITTER AND DEBRIS.
- D. FIRE SPRINKLER TEST WATER SHALL BE DRAINED TO THE SANITARY SEWER

NOTES

1. THE UNDERLYING HYDROLOGIC SOIL GROUP FOR THE SITE IS ASSUMED TO BE TYPE D
2. BIOFILTRATION BASIN IS LOCATED AT GROUND LEVEL OF THE SITE.
3. GROUNDWATER DEPTH HAS BEEN DETERMINED TO BE GREATER THAN 20' BELOW EXISTING GRADE PER THE GEOTECHNICAL REPORT.
4. NO EXISTING NATURAL HYDROLOGIC FEATURES
5. NO CRITICAL COARSE SEDIMENT YIELD AREAS ON SITE
6. ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE IMPLEMENTED

5A. SOURCE CONTROL NOTES TO COME IN MINISTERIAL REVIEW

GRAPHICAL SCALE: 1" = 20'

0 10 20 40 60

REGISTERED PROFESSIONAL ENGINEER — SEAN M. SAVAGE — No. 75677 — CIVIL — STATE OF CALIFORNIA

PREPARED BY ME OR UNDER MY DIRECTION:

FOR PLAN REVIEW ONLY

SEAN M. SAVAGE R.C.E. 75677 DATE

PROJECT NAME:

U-STOR-IT

PROJECT ADDRESS:

SORRENTO VALLEY RD. SAN DIEGO, CA. 92121

SCOPE OF WORK:

NEW SELF STORAGE FACILITY

NORTH

KEY PLAN (NTS):

DATE:

REVISIONS:

PREPARED BY:

DCA architects
Direct Design Ltd.
Carroll Associates
3321 South State Route 31
Prairie Grove, Illinois 60012
P 815.444.8444

SHEET TITLE:

DMA PLAN

PROJECT NO.	121152
PROJECT MGR.	XXX
CONCEPTUAL GRADING PLAN	

C5

FILENAME: P:\DWG OMEGA\0658 U-STOR-IT SORRENTO VALLEY\ACAD\DISCRETIONARY\0658-CGP-05-DMA.DWG DATE: 9/29/2021 8:24:51 AM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Project Name: U-Stor-It Sorrento Valley

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required) SEE DMA SHEET ON ATTACHMENT 1a	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☑ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☑ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☑ Included ☐ Submitted as separate stand-alone document

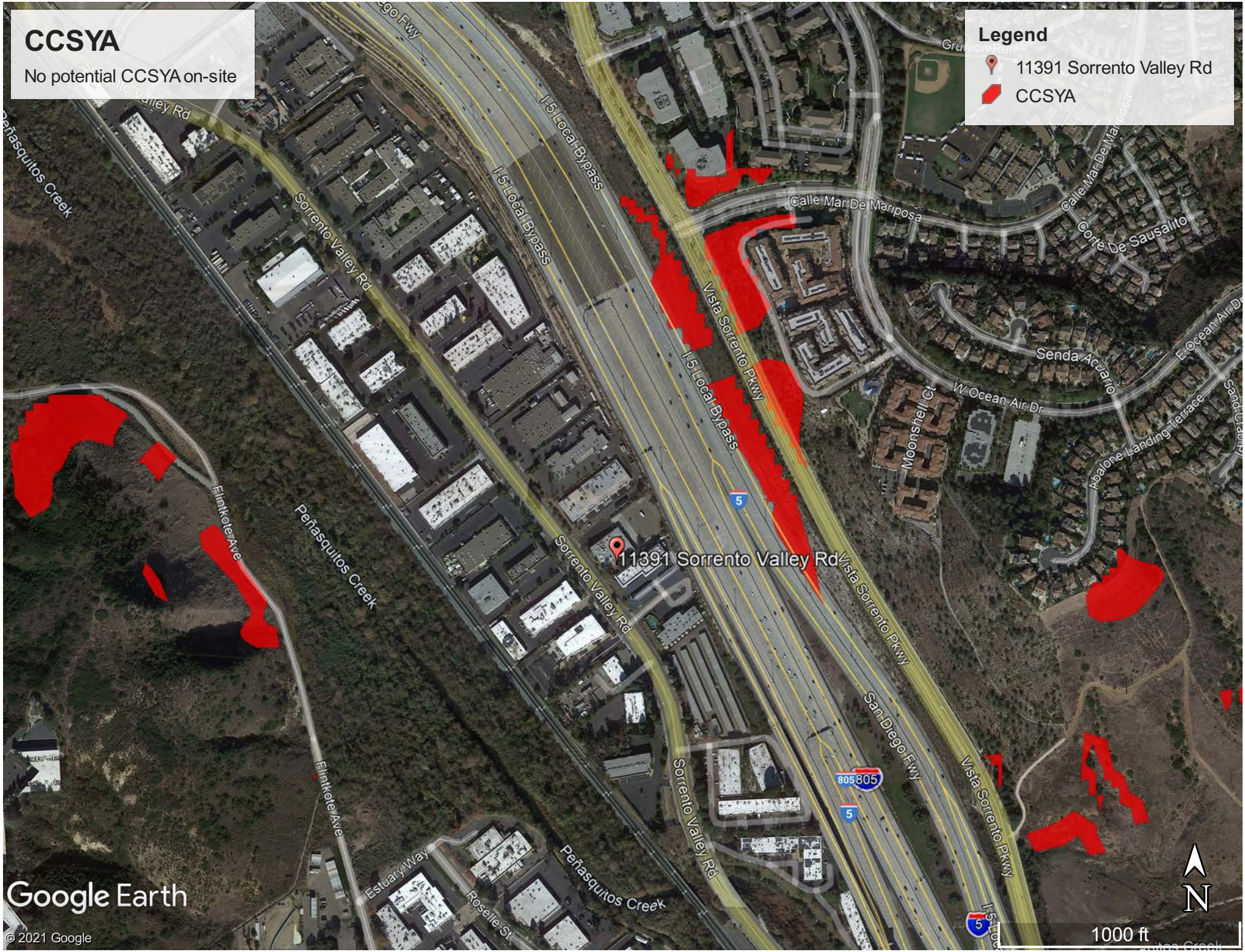
Project Name: U-Stor-It Sorrento Valley

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

- [ ] Underlying hydrologic soil group
- [ ] Approximate depth to groundwater
- [ ] Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- [ ] Critical coarse sediment yield areas to be protected OR provide a separate map showing that the project site is outside of any critical coarse sediment yield areas
- [ ] Existing topography
- [ ] Existing and proposed site drainage network and connections to drainage offsite
- [ ] Proposed grading
- [ ] Proposed impervious features
- [ ] Proposed design features and surface treatments used to minimize imperviousness
- [ ] Point(s) of Compliance (POC) for Hydromodification Management
  Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- [ ] Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail).

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING


CCSYA
No potential CCSYA on-site
Legend
11391 Sorrento Valley Rd
CCSYA
11391 Sorrento Valley Rd
Sorrento Valley Rd
I-5 Local Bypass
Vista Sorrento Pkwy
San Diego Fwy
Calle Mar De Mariposa
Corte De Sausalito
Senda Acuario
W Ocean Air Dr
Moonshell Ct
Abalone Landing Terrace
Peñasquitos Creek
Flintkote Ave
Estuary Way
Roselle St
Google Earth
© 2021 Google
N
1000 ft

U-Stor-It Sorrento Valley
Hydromodification SWMM Analysis
11391 Sorrento Valley Rd.
San Diego, CA 92121

Date Prepared:
September 29, 2021

Prepared for:
Chicago Capitol Funds, LLC
501 W. Broadway STE 2020
San Diego, CA 92121

Prepared By:

ΩMEGA
ENGINEERING CONSULTANTS
4340 Viewridge Ave, Suite B
San Diego, CA 92113
Ph: (858) 634-8620

PRELIMINARY

Patric T. de Boer RCE 83583
Registration Expires 3-31-2023

Introduction

This hydromodification report summarizes the approach and tools used to model the pre and post-development conditions at the project site at 11391 Sorrento Valley Rd., San Diego to determine if the proposed project complies with the hydromodification flow control requirements set forth in the County of San Diego BMP Design Manual dated February 2016, and the San Diego Hydromodification Management Plan dated March 2011.

The analysis was performed using Stormwater Management Model 5.1 (SWMM) provided by the Environmental Protection Agency (EPA). SWMM was used to model the pre and post-development surface conditions as well as the proposed BMPs that will be used for post development flow control.

SWMM Model Development

The project will involve the demolition of the existing development and the construction of a self-storage facility along with its corresponding improvements. The self-storage facility will consist of 3-stories above grade and 3-subterranean levels. The project will construct a lined biofiltration basin along the northerly property line for stormwater treatment and hydromodification purposes.

The pre and post developed site drain to the same Point of Compliance (POC) at the south boundary of the area to be developed. Both the pre and post-developed conditions were modeled side-by-side, within a single SWMM model, with the predeveloped sub catchment draining to E-POC and the post developed conditions draining to P-POC. Both E-POC and P-POC represent the same physical point.

The model uses the Poway Rain Gauge data available on ProjectCleanwater.org. This gauge was chosen as it is the closest one to the site and is located in an area with a similar elevation and distance from the coast. The other atmospheric data that the model considers is the average evaporation rates in inches per day. Per the California Irrigation Management Information System (CIMIS) ETo map, the site is located in Reference Zone 4.

Catchment Modeling
For the pre-developed, the underlying soil is assumed and modeled as Type 'D' soil. This determination is based off of the Geotechnical Investigation performed by Geocon, Inc. dated July 30, 2021. The investigation found the site be underlain with clays and silty clay. For the post development conditions, the soil is modeled as Type 'C' soil. This is in accordance with Section G.1.4.3 of the BMP design manual which allows soils in landscaped areas that are retilled/amended to be modeled as Type 'C'. All pervious areas on the project site will be landscaped. The soils in these areas will not be compacted

Infiltration Values from Table G.1-4 of City BMP Design Manual

Condition	Suction Head	Conductivity	Initial Deficit
Pre-developed	9.0	0.01875	0.30
Post-developed	6.0	0.1	0.31

* The conductivity for the pre-developed conditions has been reduced by 25% since the redevelopment areas in the existing conditions is currently asphalt. See Table G.1-4 on Appendix G of the City of San Diego Storm Water Standards, section "Conductivity (Green-Ampt)" for more details.

Surface Parameters from Table G.1-4 of City BMP Design Manual

	Catchment	Area	Width	Slope	% Imperv	N-Imperv	N-Perv	Dstore Imperv	Dstor Perv	LID Controls
Pre	EX-1	1.46416	172	5.1%	0	0.01	0.08	0.05	0.10	-
Post	DMA-1	0.641988	104	7.8%	88	0.01	0.08	0.05	0.10	-
	BIO-1	0.036731	10	0%	0	0.01	0.08	0.05	0.10	BIO-1
	DMA-2	0.717654	109	5.0%	87	0.01	0.08	0.05	0.10	-
	DMA-3	0.004408	12	1.0%	0	0.01	0.08	0.05	0.10	-
	DMA-4	0.048531	132	3.6%	0	0.01	0.08	0.05	0.10	-

The area, width, slope, and % impervious were all determined from the site-specific conditions. N-Impervious and N-Pervious values are taken from the County approved "Improving Accuracy in Continuous Hydrologic Modeling: Guidance for Selecting Pervious Overland Flow Manning's n Values in the San Diego Region", TRWE, 2016. Dstor Imperv and Dstor Perv were taken from table G.1-4 of the Vista BMP Design Manual.

The N-Perv value of 0.08 for the pre-developed conditions corresponds with the assumed chaparral natural landscape that consists of "shrubs and bushes."

The N-Perv Value of 0.08 for the post developed conditions was chosen, as the pervious area will be landscaped and mulched.

The slope of each catchment is determined by dividing the elevation differential by the length of the flowpath.

Detention Facility Modeling

In the post developed conditions, a lined biofiltration basin will be constructed along the frontage of the property. The basin will be built with a low flow control orifice on the perforated sub drain that drains to an outlet structure. The outlet structure will have a grate 9" above the finish grade of the basin that will act as an overflow structure. The stormwater then drains out via a proposed curb outlet to the curb and gutter on Sorrento Valley Road.

The biofiltration facility is modeled using the LID Editor (See LID BMP Modeling section below for more details). The surface storage above finish grade of the biofiltration facility has been modeled as a separate storage node. See Storage Calculations section of this report.

LID BMP Modeling

The post developed conditions use the LID Modeling Module of SWMM 5.1 to model the effects that the proposed biofiltration basin will have on the discharge rates. The biofiltration basin is modeled with LID controls that are applied to a portion of the catchment that contains them.

LID Control Parameters

	LID Control	BIO-1
	Area (sf)	1600
Surface	**Berm Height (in)**	9
	***Vegetation Volume**	0
	***Surface Roughness**	0
	***Surface Slope (%)**	0
Soil	**Thickness (in)**	21
	***Porosity**	0.4
	***Field Capacity**	0.2
	***Wilting Point**	0.1
	***Conductivity (in/hr)**	5.0
	***Conductivity Slope**	5.0
	***Suction Head (in)**	1.5
Storage	**Thickness (in)**	12
	***Void Ratio**	0.67
	***Seepage Rate (in/hr)**	0
	***Clogging Factor**	0
Drain	**Flow Coefficient**	0.1386
	Flow Exponent	0.5
	Offset Height (in)	0
	Outlet Orifice Dia. (in)	0.50

***Indicates that the parameters are taken from Table G.1-7 of the BMP design Manual.**

The drain offset in LID is considered to be 0 ft, as the volume in the 3" of gravel below the drain never leaves the facility.

Outlet Orifice Size

The low flow orifice on the subdrain of the biofiltration basins is modeled using the drain coefficients listed in the above table. The drain coefficient (C) and flow exponent (n) determines the rate of flow through a drain as a function of the height of stored water above the drain's offset. The following equation is used to compute this flow rate (per unit area of the LID unit):

$$q = Ch^n$$

where **q** is outflow (in/hr per sf of LID area) and **h** is the height of saturated media.

Flow Duration Curve Comparison

The Flow Duration Curves (FDCs) for the pre and post-developed conditions were compared at the POC. The FDCs were compared for flows within the flow thresholds. No erosion susceptibility analysis has been performed for the receiving waterway (Los Penasquitos Lagoon). No accepted analyses are known to exist for the portion of Los Penasquitos Lagoon that this project drains to.

The default flow thresholds of 0.1Q2-Q10 were used for this analysis. As can be seen in the plotted FDCs in Attachment 1, the post-developed FDC does not exceed the pre-developed FDC by more than 10% at any point for the peak flows within the flow threshold.

Summary

Analysis duration curve of the flow duration curve comparison indicates that there are no exceedances of more than 110% of the predeveloped conditions were observed.

It is the opinion of Omega Engineering Consultants that this project has demonstrated compliance with the current hydromodification requirements.

Attachments

1. Flow Duration Curves
2. SWMM Model Layout
3. BMP Drawdown
4. Flow Coefficient Calculation
5. SWMM input file
6. SWMM output file

Pre-project Flow Frequency - Long-term Simulation

10-year Q:	0.965	cfs
2-year Q:	0.621	cfs
Lower Flow Threshold:	10%	
0.1xQ2 (Pre):	0.062	cfs

Statistics - Node E-POC Total Inflow

Rank	Start Date	Event Duration (hours)	Event Peak (CFS)	Exceedance Frequency (percent)	Return Period (years)
1	3/24/1983	15	1.113	0.29	47
2	2/18/1980	85	1.11	0.58	23.5
3	1/25/1995	16	0.993	0.88	15.67
4	1/9/1978	30	0.975	1.17	11.75
5	3/17/1982	21	0.962	1.46	9.4
6	12/28/2004	21	0.925	1.75	7.83
7	11/5/1987	3	0.865	2.05	6.71
8	11/29/1982	23	0.824	2.34	5.88
9	2/8/1998	17	0.822	2.63	5.22
10	2/3/1998	29	0.807	2.92	4.7
11	11/12/1976	2	0.806	3.22	4.27
12	12/17/1978	32	0.8	3.51	3.92
13	2/28/1970	4	0.796	3.8	3.62
14	12/28/1978	40	0.78	4.09	3.36
15	2/14/1998	9	0.726	4.39	3.13
16	3/1/1983	69	0.697	4.68	2.94
17	2/8/1983	6	0.684	4.97	2.76
18	1/5/1979	24	0.678	5.26	2.61
19	1/6/1974	30	0.674	5.56	2.47
20	1/28/1980	47	0.673	5.85	2.35
21	12/9/1965	29	0.672	6.14	2.24
22	1/9/2005	25	0.645	6.43	2.14
23	4/18/1995	8	0.621	6.73	2.04
24	3/17/1983	30	0.62	7.02	1.96
25	2/8/1993	7	0.614	7.31	1.88
26	11/16/1972	23	0.614	7.6	1.81
27	2/27/2001	14	0.602	7.89	1.74
28	3/17/1963	2	0.587	8.19	1.68
29	2/20/2000	27	0.575	8.48	1.62
30	10/27/2004	13	0.568	8.77	1.57
31	12/4/1974	4	0.563	9.06	1.52
32	3/8/1974	12	0.556	9.36	1.47
33	2/12/2003	5	0.549	9.65	1.42
34	2/17/1998	9	0.546	9.94	1.38
35	1/15/1993	80	0.538	10.23	1.34

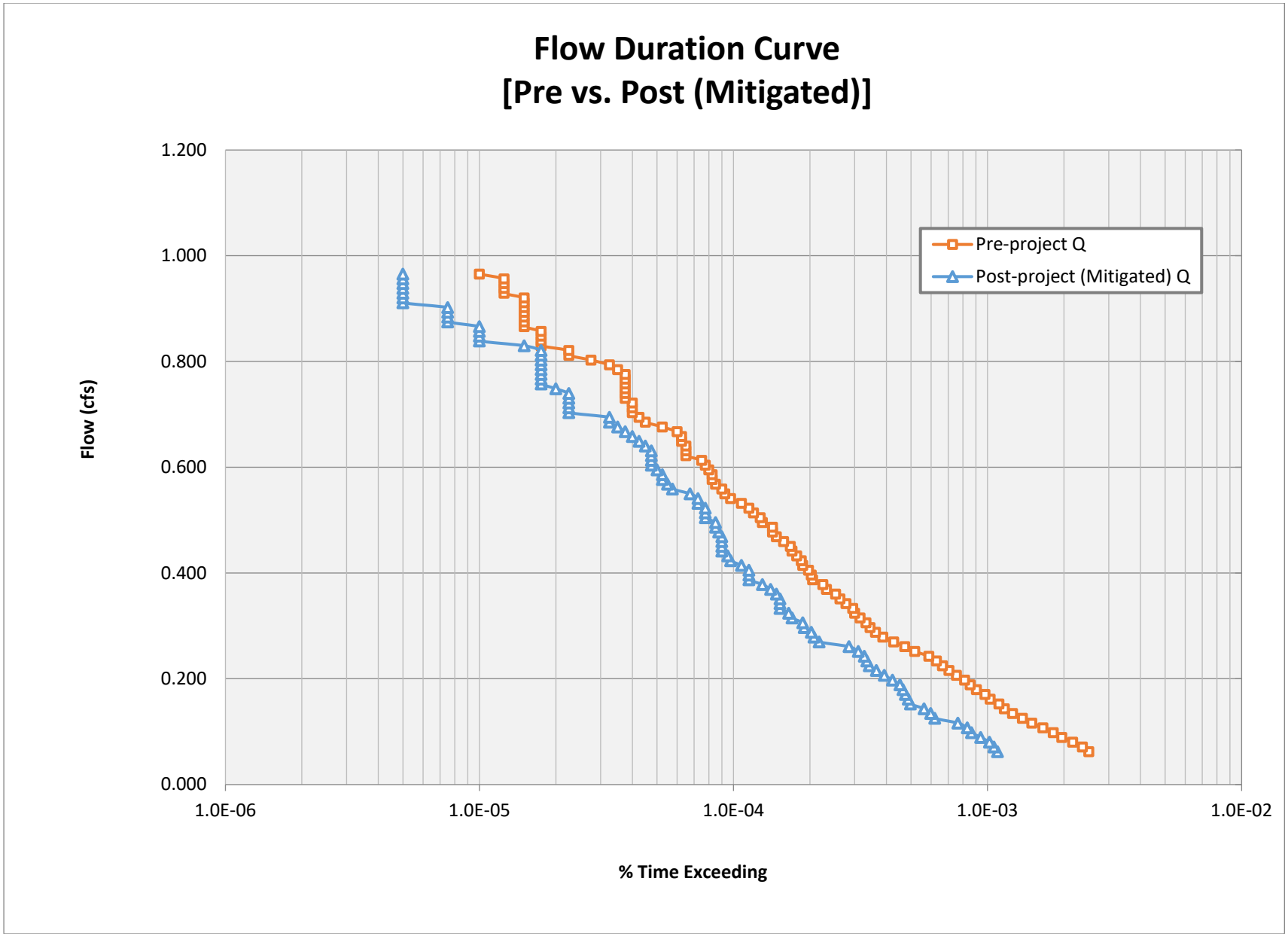
Low-flow Threshold:	10%	
0.1xQ2 (Pre):	0.062	cfs
Q10 (Pre):	0.965	cfs
Ordinate #:	100	
Incremental Q (Pre):	0.00903	cfs
Total Hourly Data:	400038	hours

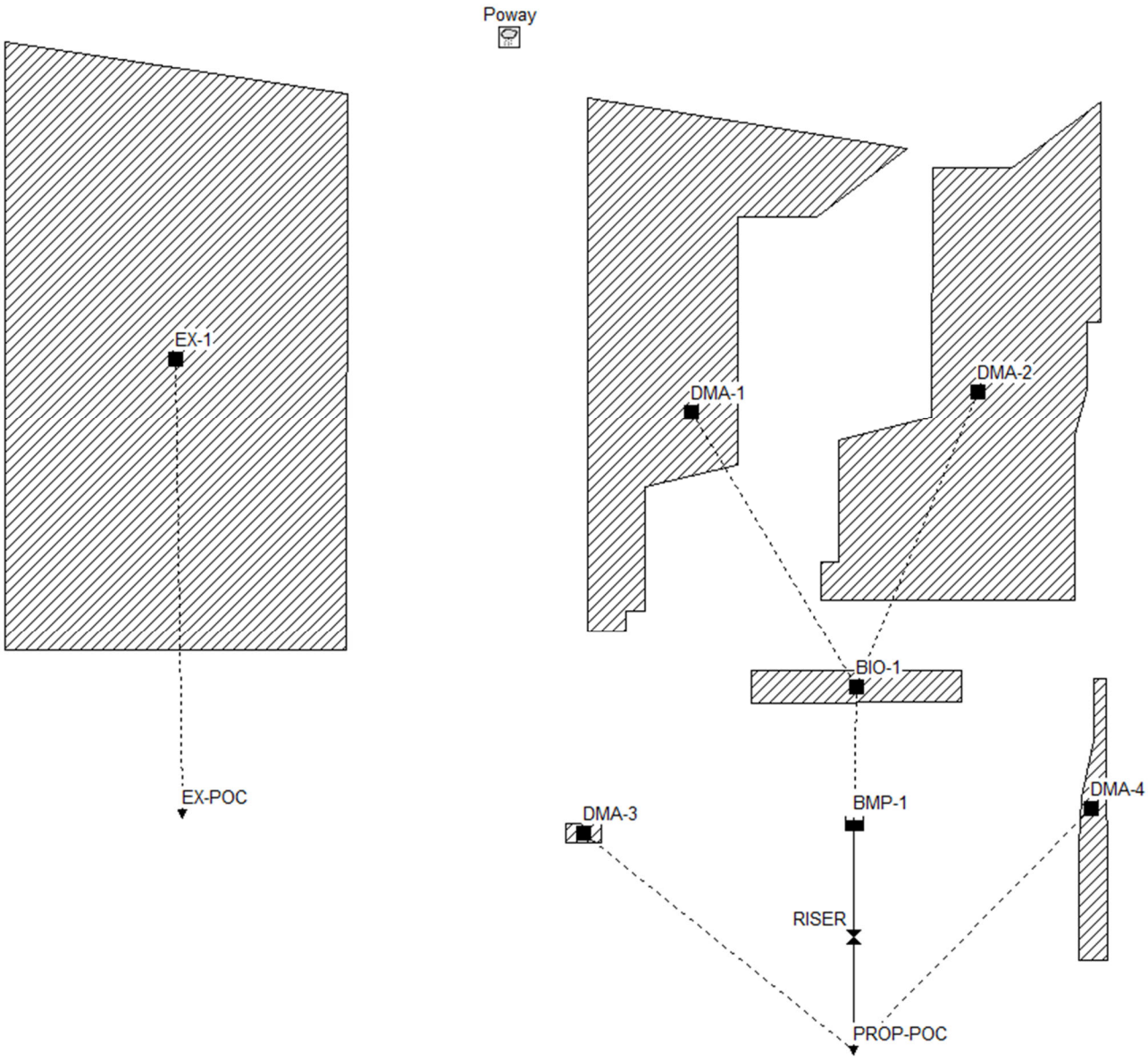
The proposed BMP: **PASSED**

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	0.062	1002	2.50E-03	438	1.09E-03	44%	Pass
1	0.071	946	2.36E-03	424	1.06E-03	45%	Pass
2	0.080	866	2.16E-03	407	1.02E-03	47%	Pass
3	0.089	785	1.96E-03	376	9.40E-04	48%	Pass
4	0.098	726	1.81E-03	346	8.65E-04	48%	Pass
5	0.107	661	1.65E-03	333	8.32E-04	50%	Pass
6	0.116	598	1.49E-03	306	7.65E-04	51%	Pass
7	0.125	549	1.37E-03	248	6.20E-04	45%	Pass
8	0.134	502	1.25E-03	239	5.97E-04	48%	Pass
9	0.143	466	1.16E-03	225	5.62E-04	48%	Pass
10	0.152	444	1.11E-03	199	4.97E-04	45%	Pass
11	0.161	410	1.02E-03	195	4.87E-04	48%	Pass
12	0.170	391	9.77E-04	190	4.75E-04	49%	Pass
13	0.179	362	9.05E-04	186	4.65E-04	51%	Pass
14	0.189	342	8.55E-04	181	4.52E-04	53%	Pass
15	0.198	325	8.12E-04	169	4.22E-04	52%	Pass
16	0.207	302	7.55E-04	157	3.92E-04	52%	Pass
17	0.216	282	7.05E-04	146	3.65E-04	52%	Pass
18	0.225	266	6.65E-04	137	3.42E-04	52%	Pass
19	0.234	252	6.30E-04	134	3.35E-04	53%	Pass
20	0.243	235	5.87E-04	131	3.27E-04	56%	Pass
21	0.252	207	5.17E-04	124	3.10E-04	60%	Pass
22	0.261	189	4.72E-04	114	2.85E-04	60%	Pass
23	0.270	171	4.27E-04	87	2.17E-04	51%	Pass
24	0.279	155	3.87E-04	83	2.07E-04	54%	Pass
25	0.288	145	3.62E-04	81	2.02E-04	56%	Pass
26	0.297	138	3.45E-04	76	1.90E-04	55%	Pass
27	0.306	133	3.32E-04	75	1.87E-04	56%	Pass
28	0.315	126	3.15E-04	68	1.70E-04	54%	Pass

29	0.324	120	3.00E-04	66	1.65E-04	55%	Pass
30	0.333	118	2.95E-04	61	1.52E-04	52%	Pass
31	0.342	111	2.77E-04	61	1.52E-04	55%	Pass
32	0.351	105	2.62E-04	61	1.52E-04	58%	Pass
33	0.360	101	2.52E-04	59	1.47E-04	58%	Pass
34	0.369	93	2.32E-04	56	1.40E-04	60%	Pass
35	0.378	90	2.25E-04	52	1.30E-04	58%	Pass
36	0.387	82	2.05E-04	46	1.15E-04	56%	Pass
37	0.396	81	2.02E-04	46	1.15E-04	57%	Pass
38	0.405	79	1.97E-04	46	1.15E-04	58%	Pass
39	0.414	75	1.87E-04	43	1.07E-04	57%	Pass
40	0.423	74	1.85E-04	39	9.75E-05	53%	Pass
41	0.432	71	1.77E-04	38	9.50E-05	54%	Pass
42	0.441	68	1.70E-04	36	9.00E-05	53%	Pass
43	0.450	67	1.67E-04	36	9.00E-05	54%	Pass
44	0.459	63	1.57E-04	36	9.00E-05	57%	Pass
45	0.469	59	1.47E-04	36	9.00E-05	61%	Pass
46	0.478	57	1.42E-04	35	8.75E-05	61%	Pass
47	0.487	57	1.42E-04	34	8.50E-05	60%	Pass
48	0.496	52	1.30E-04	34	8.50E-05	65%	Pass
49	0.505	51	1.27E-04	31	7.75E-05	61%	Pass
50	0.514	48	1.20E-04	31	7.75E-05	65%	Pass
51	0.523	46	1.15E-04	31	7.75E-05	67%	Pass
52	0.532	43	1.07E-04	29	7.25E-05	67%	Pass
53	0.541	39	9.75E-05	29	7.25E-05	74%	Pass
54	0.550	37	9.25E-05	27	6.75E-05	73%	Pass
55	0.559	36	9.00E-05	23	5.75E-05	64%	Pass
56	0.568	34	8.50E-05	22	5.50E-05	65%	Pass
57	0.577	33	8.25E-05	21	5.25E-05	64%	Pass
58	0.586	33	8.25E-05	21	5.25E-05	64%	Pass
59	0.595	32	8.00E-05	20	5.00E-05	63%	Pass
60	0.604	31	7.75E-05	19	4.75E-05	61%	Pass
61	0.613	30	7.50E-05	19	4.75E-05	63%	Pass
62	0.622	26	6.50E-05	19	4.75E-05	73%	Pass
63	0.631	26	6.50E-05	19	4.75E-05	73%	Pass
64	0.640	26	6.50E-05	18	4.50E-05	69%	Pass
65	0.649	25	6.25E-05	17	4.25E-05	68%	Pass
66	0.658	25	6.25E-05	16	4.00E-05	64%	Pass
67	0.667	24	6.00E-05	15	3.75E-05	63%	Pass
68	0.676	21	5.25E-05	14	3.50E-05	67%	Pass
69	0.685	18	4.50E-05	13	3.25E-05	72%	Pass
70	0.694	17	4.25E-05	13	3.25E-05	76%	Pass
71	0.703	16	4.00E-05	9	2.25E-05	56%	Pass

72	0.712	16	4.00E-05	9	2.25E-05	56%	Pass
73	0.721	16	4.00E-05	9	2.25E-05	56%	Pass
74	0.730	15	3.75E-05	9	2.25E-05	60%	Pass
75	0.740	15	3.75E-05	9	2.25E-05	60%	Pass
76	0.749	15	3.75E-05	8	2.00E-05	53%	Pass
77	0.758	15	3.75E-05	7	1.75E-05	47%	Pass
78	0.767	15	3.75E-05	7	1.75E-05	47%	Pass
79	0.776	15	3.75E-05	7	1.75E-05	47%	Pass
80	0.785	14	3.50E-05	7	1.75E-05	50%	Pass
81	0.794	13	3.25E-05	7	1.75E-05	54%	Pass
82	0.803	11	2.75E-05	7	1.75E-05	64%	Pass
83	0.812	9	2.25E-05	7	1.75E-05	78%	Pass
84	0.821	9	2.25E-05	7	1.75E-05	78%	Pass
85	0.830	7	1.75E-05	6	1.50E-05	86%	Pass
86	0.839	7	1.75E-05	4	1.00E-05	57%	Pass
87	0.848	7	1.75E-05	4	1.00E-05	57%	Pass
88	0.857	7	1.75E-05	4	1.00E-05	57%	Pass
89	0.866	6	1.50E-05	4	1.00E-05	67%	Pass
90	0.875	6	1.50E-05	3	7.50E-06	50%	Pass
91	0.884	6	1.50E-05	3	7.50E-06	50%	Pass
92	0.893	6	1.50E-05	3	7.50E-06	50%	Pass
93	0.902	6	1.50E-05	3	7.50E-06	50%	Pass
94	0.911	6	1.50E-05	2	5.00E-06	33%	Pass
95	0.920	6	1.50E-05	2	5.00E-06	33%	Pass
96	0.929	5	1.25E-05	2	5.00E-06	40%	Pass
97	0.938	5	1.25E-05	2	5.00E-06	40%	Pass
98	0.947	5	1.25E-05	2	5.00E-06	40%	Pass
99	0.956	5	1.25E-05	2	5.00E-06	40%	Pass
100	0.965	4	1.00E-05	2	5.00E-06	50%	Pass


Flow Duration Curve
[Pre vs. Post (Mitigated)]
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Flow (cfs)
1.0E-06
1.0E-05
1.0E-04
1.0E-03
1.0E-02
% Time Exceeding
Pre-project Q
Post-project (Mitigated) Q


Poway
EX-1
EX-POC
DMA-1
DMA-2
BIO-1
DMA-3
BMP-1
DMA-4
RISER
PROP-POC

Biofiltration Basin Draw Down

Surface Ponding	= 9 in = 0.75 ft
Soil Media Depth	= 21 in = 1.75 ft
Gravel Depth	= 12 in = 1.0 ft
Total Depth	= 42 in = 3.5 ft
Soil Porosity	= 0.2 in/hr
Gravel Porosity	= 0.4 in/hr
BMP-1 Orifice Diameter (D)	= 0.50 in
Orifice Coefficient (C_g)	= 0.65
Drain Exponent (n)	= 0.5
Gravitation Constant (g)	= 32.2 ft/s^2
BMP-1 Orifice Flow Rate (Q)	= 0.017 (see calcs below)

$$Q = \frac{\pi}{4} C_g * \left(\frac{D}{12}\right)^2 * 2g \left(\frac{Total\ Depth}{2} - 0.5\right)\left(\frac{D}{12}\right)^n$$

Total Depth is divided by 2 to calculate the head more accurately on the orifice while the system is drawing down.

BMP-1
Surface Area = 1,600 sf

Total Volume:
$V = Surface\ Volume + Media\ Voume + Gravel\ Volume$
$V = (1600)(0.75) + (1600)(1.75)(0.2) + (1600)(1.0)(0.4)$
$V = 2400\ cf$
$Drawdown = \frac{V}{Q}$
$Drawdown = \frac{2400}{0.017} * \frac{1\ hr}{3600\ s} = 39.22\ hrs$

SWMM Model Flow Coefficient Calculation			
BIO-1 Flow Coefficient & Orifice Size			
PARAMETER	**ABBREV.**	**Bio-Retention Cell LID BMP**	
Ponding Depth	PD	9	in
Bioretention Soil Layer	S	21	in
Gravel Layer	G	12	in
TOTAL		3.5	ft
		42	in
Orifice Coefficient	c_g	0.65	--
Low Flow Orifice Diameter	D	0.36	in
Drain exponent	n	0.5	--
Flow Rate (volumetric)	Q	0.007	cfs
Ponding Depth Surface Area	A_{PD}	215	ft^2
Bioretention Surface Area	A_S, A_G	215	ft^2
	A_S, A_G	0.0049	ac
Porosity of Bioretention Soil	n	0.20	-
Flow Rate (per unit area)	q	7.080	in/hr
Effective Ponding Depth	PD_{eff}	**9.00**	in
Flow Coefficient	C	**1.0575**	--

```
[TITLE]

;;Project Title/Notes


[OPTIONS]

;;Option            Value

FLOW_UNITS          CFS

INFILTRATION        GREEN_AMPT

FLOW_ROUTING        KINWAVE

LINK_OFFSETS        DEPTH

MIN_SLOPE           0

ALLOW_PONDING       NO

SKIP_STEADY_STATE   NO


START_DATE          10/04/1962

START_TIME          00:00:00

REPORT_START_DATE   10/04/1962

REPORT_START_TIME   00:00:00

END_DATE            05/23/2008

END_TIME            06:00:00

SWEEP_START         01/01

SWEEP_END           12/31

DRY_DAYS            0

REPORT_STEP         01:00:00

WET_STEP            00:15:00

DRY_STEP            04:00:00

ROUTING_STEP        0:01:00

RULE_STEP           00:00:00
```

```
INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.566
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
MONTHLY         0.06   0.08   0.110  0.160  0.180  0.210  0.210  0.200  0.160  0.120  0.080  0.060
DRY_ONLY        NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
Poway           INTENSITY 1:00     1.0      TIMESERIES Poway

[SUBCATCHMENTS]
;;Name           Rain Gage       Outlet          Area     %Imperv  Width    %Slope   CurbLen  SnowPack
```

```
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
EX-1            Poway           EX-POC          1.46416  0       172      5.1      0
DMA-1           Poway           BIO-1           0.641988 93      104      7.8      0
DMA-3           Poway           PROP-POC        0.004408 0       12       1.0      0
DMA-4           Poway           PROP-POC        0.048531 0       132      3.6      0
DMA-2           Poway           BIO-1           0.717654 87      109      5.0      0
BIO-1           Poway           BMP-1           0.036731 0       10       0        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv    S-Imperv   S-Perv    PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
EX-1            0.01       0.08       0.05       0.10       25         OUTLET
DMA-1           0.01       0.08       0.05       0.10       25         PERVIOUS   100
DMA-3           0.01       0.08       0.05       0.10       25         OUTLET
DMA-4           0.01       0.08       0.05       0.10       25         OUTLET
DMA-2           0.01       0.08       0.05       0.10       25         PERVIOUS   100
BIO-1           0.01       0.05       0.05       0.10       25         OUTLET

[INFILTRATION]
;;Subcatchment   Param1    Param2    Param3    Param4    Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
EX-1            9.0        0.01875    0.30
DMA-1           6.0        0.1        0.31
DMA-3           6.0        0.1        0.31
DMA-4           6.0        0.1        0.31
DMA-2           6.0        0.1        0.31
BIO-1           6.0        0.1        0.31
```

```
[LID_CONTROLS]
;;Name          Type/Layer Parameters
;;--------------- ---------- ----------
BIO-1           BC
BIO-1           SURFACE    9        0        0        0        5
BIO-1           SOIL       21       0.4      0.2      0.1      5        5        1.5
BIO-1           STORAGE    12       0.67     0        0
BIO-1           DRAIN      0.1754   0.5      0        6        0        0

[LID_USAGE]
;;Subcatchment   LID Process     Number  Area      Width     InitSat   FromImp   ToPerv    RptFile                DrainTo         FromPerv
;;--------------- ---------------- -------- ---------- ---------- ---------- ---------- ---------- ------------------------- ---------------- ----------
BIO-1           BIO-1           1       1600.00   0         0         100       0         *                      PROP-POC        100

[OUTFALLS]
;;Name          Elevation  Type       Stage Data       Gated    Route To
;;--------------- ---------- ---------- ---------------- -------- ----------------
PROP-POC        0          FREE                        NO
EX-POC          0          FREE                        NO

[STORAGE]
;;Name          Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;--------------- -------- ---------- ---------- ---------- ------------------------------ -------- --------         -------- --------
BMP-1           0        1.5        0          TABULAR    BMP-1                        0        0

[WEIRS]
```

```
;;Name         From Node       To Node         Type         CrestHt    Qcoeff     Gated    EndCon   EndCoeff   Surcharge  RoadWidth  RoadSurf   Coeff. Curve
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- -------- ---------- ---------- ---------- ---------- ----------------
RISER          BMP-1           PROP-POC        TRANSVERSE   0          3.33       NO       0        0          YES

[XSECTIONS]
;;Link         Shape       Geom1          Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
RISER          RECT_OPEN    1              12         0          0

[CURVES]
;;Name         Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
BMP-1          Storage    0          1600
BMP-1                     1.5        1600

[TIMESERIES]
;;Name         Date       Time       Value
;;-------------- ---------- ---------- ----------
Poway          10/4/1962  15:00      0.01
Poway          10/4/1962  16:00      0.01
Poway          12/17/1962 9:00       0.04
Poway          12/18/1962 4:00       0.02
Poway          12/18/1962 5:00       0.02
Poway          12/18/1962 6:00       0.04
Poway          12/18/1962 7:00       0.03
Poway          12/18/1962 8:00       0.03
Poway          12/18/1962 9:00       0.02
```

Poway	12/19/1962	10:00	0.01
Poway	12/20/1962	11:00	0.01
Poway	1/9/1963	2:00	0.02
Poway	1/9/1963	3:00	0.02
Poway	1/9/1963	4:00	0.04
Poway	1/9/1963	5:00	0.1
Poway	1/9/1963	6:00	0.04
Poway	1/9/1963	9:00	0.09
Poway	1/10/1963	1:00	0.05
Poway	1/10/1963	20:00	0.03
Poway	1/10/1963	23:00	0.02
Poway	1/11/1963	5:00	0.05
Poway	1/11/1963	10:00	0.01
Poway	1/11/1963	11:00	0.01
Poway	2/9/1963	15:00	0.05
Poway	2/9/1963	16:00	0.17

THE FULL TIME SERIES IS NOT INCLUDED HERE, AS THE FULL SET IS 150+ PAGES LONG. THE FULL DATA SET CAN BE FOUND ON PROJECTCLEANWATER.ORG

****
LID Performance Summary
****

Topic: LID Performance Click a column header to sort the column.

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Initial Storage in	Final Storage in	Continuity Error %
BIO-1	BIO-1	12985.47	669.47	0.00	2222.75	10093.73	2.10	2.10	-0.00

Topic: Subcatchment Runoff Click a column header to sort the column.

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Imperv Runoff in	Perv Runoff in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
EX-1	558.06	0.00	22.82	411.72	0.00	126.13	126.13	5.01	1.12	0.226
DMA-1	558.06	0.00	90.37	113.24	438.84	371.39	371.39	6.47	0.51	0.666
DMA-3	558.06	0.00	3.82	523.37	0.00	33.93	33.93	0.00	0.00	0.061
DMA-4	558.06	0.00	3.80	522.87	0.00	35.09	35.09	0.05	0.03	0.063
DMA-2	558.06	0.00	86.30	183.12	409.59	303.82	303.82	5.92	0.57	0.544
BIO-1	558.06	12427.41	669.44	0.00	0.00	0.00	12316.01	12.28	1.11	0.948

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: U-Stor-It Sorrento Valley

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☐ Not applicable

WILL BE PROVIDED IN MINISTERIAL REVIEW

Project Name: U-Stor-It Sorrento Valley

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3: For private entity operation and maintenance, Attachment 3 must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- [x] Vicinity map
- [x] Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- [x] BMP and HMP location and dimensions
- [x] BMP and HMP specifications/cross section/model
- [x] Maintenance recommendations and frequency
- [ ] LID features such as (permeable paver and LS location, dim, SF).

The City of SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO AND
WHEN RECORDED MAIL TO:

_____

_____

_____ _____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSORS PARCEL NUMBER:	PROJECT NUMBER:
_____	_____	_____

This agreement is made by and between the City of San Diego, a municipal corporation [City] and _____

_____,

the owner or duly authorized representative of the owner [Property Owner] of property located at

_____

(Property Address)

and more particularly described as: _____

_____

(Legal Description of Property)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Storm Water Quality Management Plan [SWQMP] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): _____.

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) _____.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): _____

_____
(Owner Signature)

_____
(Print Name and Title)

_____
(Company/Organization Name)

_____
(Date)

THE CITY OF SAN DIEGO

APPROVED:

_____
(City Control Engineer Signature)

_____
(Print Name)

_____
(Date)

NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDGMENTS PER CIVIL CODE SEC. 1180 ET.SEQ.

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

Project Name: U-Stor-It Sorrento Valley

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

Attachment 5
Drainage Report

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

U-Stor-It Sorrento Valley
Drainage Study
11391 Sorrento Valley Rd.
San Diego, CA 92121

Date Prepared:
September 27, 2021

Prepared for:
Chicago Capitol Funds, LLC
501 W. Broadway STE 2020
San Diego, CA 92101

Prepared By:

ΩMEGA
ENGINEERING CONSULTANTS
4340 Viewridge Ave, Suite B
San Diego, CA 92113
Ph: (858) 634-8620

Declaration of Responsible Charge:
I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards. I understand that the check of the project drawings and specifications by the City of San Diego is confined to a review only and does not relieve me, as an engineer of work, of my responsibilities for project design.

PRELIMINARY

Patric T. de Boer RCE 83583
Registration Expires 3-31-2023

Table of Contents

Appendices

Site & Project Description

This drainage study has been prepared for the proposed commercial development at 11391 Sorrento Valley Rd., San Diego, CA 92121. The project site is currently occupied by a single-story commercial building and asphalt parking lot. The site is located approximately 0.5 miles north from the intersection between Interstate 5 and Interstate 805. See figure No. 1 for a Vicinity Map.

The project will involve the demolition of the existing commercial development and the construction of a self-storage facility along with its corresponding improvements. The self-storage facility will consist of two stories above grade and three subterranean levels. The self-storage facility will occupy the majority of the site. Landscape areas, driveways and a biofiltration facility are part of the proposed site improvements. The total area of analysis is 1.60 acres.

The proposed project will be built with its corresponding private storm drain system. A lined biofiltration basin will be constructed for stormwater treatment purposes. The treatment properties of the facility are detailed in a separate Stormwater Quality Report (SWQMP).

Methodology

The Modified Rational Method was used to determine the peak flowrates generated by the existing and proposed site conditions. The flowrates generated by sub-basins were confluence according to the junction equations as detailed on page 3-24 of the San Diego County Hydrology Manual.

The proposed storm drain pipes and channels were sized using Manning's Equation as specified for circular on page 7-78 & 7-18 of *The Handbook of Hydraulics,* by Brater & King.

The initial time of concentration (Ti) and maximum overland flow length (Lm) were determined using Table 3-2 of the Hydrology Manual included as Appendix 6 on this report.

The 100-yr, 6-hr storm depth (P_6) was determined using the isopluvial map included as Appendix 2 of this report.

The total time of concentration was determined by adding the Ti value to the travel time (Tt). Tt for surface flow on an asphalt swale was determined by modeling the approximate existing grades of the existing parking lot using Hydraflow Express to determine a velocity. Tt for proposed ribbon gutter was also determined modeling the proposed gutter using Hydraflow Express to determine a velocity. See Appendix 7 for Hydraflow Exhibits. Then the length of flow was divided by the flow velocity to determine Tt.

$$\mathbf{Tc = Ti+Tt}$$

The Tc and the P_6 values were entered into the peak intensity formula from page 3-7 of the hydrology manual to determine the intensity of the rainfall during the peak of the 100-year, 6-hr storm.

$$\mathbf{I = 7.44 \times P_6 \times Tc^{-0.645}}$$

The peak discharge rate was determine using the Rational Method Formula.

$$Q = C \times I \times A$$

See the attached calculations for particulars. The following references have been used in preparation of this report:

(1) Handbook of Hydraulics, E.F. Brater & H.W. King, 6th Ed., 1976.
(2) County of San Diego Hydrology Manual, 2003
(3) Modern Sewer Design, American Iron & Steel Institute, 1st Ed., 1980

Existing Conditions

The existing site is currently occupied by a single-story commercial building and asphalt parking lot. The project area is 83% impervious with a general slope between 1% and 5%. The site receives offsite runoff from the southerly development and a portion of landscape along the easterly boundary line.

The offsite runoff generated by the southerly property drains via an asphalt swale into the onsite parking lot where it comingles with onsite flow. The portion of landscape on the easterly boundary line sheet flows to the onsite flow on the onsite parking lot.

The entire site drains from the easterly portion of the site towards the westerly driveway via surface flow. The runoff then drains to the gutter on Sorrento Valley Road. This point is referred to as Discharge Point # 1 in this report.

Proposed Conditions

The project proposes to construct a self-storage facility with two stories above grade and three subterranean levels along with its corresponding improvements. The site was analyzed as two onsite drainage basins that encompass the entire building, landscape and hardscape. The site will modify the drainage system but will keep the same discharge point as the existing conditions.

The runoff generated from the westerly portion of the roof from the self-storage facility will drain towards the west directly to a lined biofiltration basin. The northerly and easterly portions of the site will drain to a series of grated inlets along the gutter on the northerly drive aisle. The collected stormwater will drain via pipe flow to a 36-inch precast box inside the lined biofiltration facility. The southerly portion of the site will drain via gutter flow on the southerly drive aisle into a trench drain that will be connected to the lined biofiltration basin. After treatment, the stormwater discharges to the gutter on Sorrento Valley Rd. via a curb outlet. This point is referred as Discharge Point # 1 in this report.

The offsite flow generated by the southerly property will be bypassed via a brow ditch along the southerly property line and drain on a F-type catch basin, thence to a curb outlet and ultimately on the gutter along Sorrento Valley Rd. The offsite flow travels north approximately 180 feet towards Discharge Point # 1.

Existing Rational Analysis

The existing site is modeled as one onsite and one offsite basin. The existing basins are referred as E-1 and O-1 in this report. The average slope of the basin is 3.0%. The weighted runoff coefficient is 0.82.

Below is a summary of the input data and the resulting flowrates for the 100-year, 6- hour storm.

Existing Rational Calculation Summary

Basin	Impervious %	C	I_{100} (in/hr)	Area (ac)	Q_{100} (cfs)	DP-#
E-1	83%	0.81	6.59	1.50	7.98	DP-1
O-1	73%	0.75	6.59	0.10	0.49	
		Confluence Flow = 8.46 cfs				

The confluence peak runoff flowrate for Discharge Point #1 is 8.46 cfs.

Proposed Rational Analysis

The proposed site was modeled as a two onsite and one offsite basin. The proposed basins are referred to as P-1, P-2 and O-1 in this report. The average slope of the basin is 3.7%. The weighted runoff coefficient is 0.80.

Proposed Rational Calculation Summary

Basin	Impervious %	C	I_{100} (in/hr)	Area (ac)	Q_{100} (cfs)	DP-#
P-1	86%	0.82	6.59	1.45	7.85	DP-1
P-2	0%	0.35	6.59	0.05	0.11	
O-1	73%	0.75	6.59	0.10	0.49	

Below is a summary of the proposed confluence flow calculations.

Proposed Flow Junction Calculation Summary

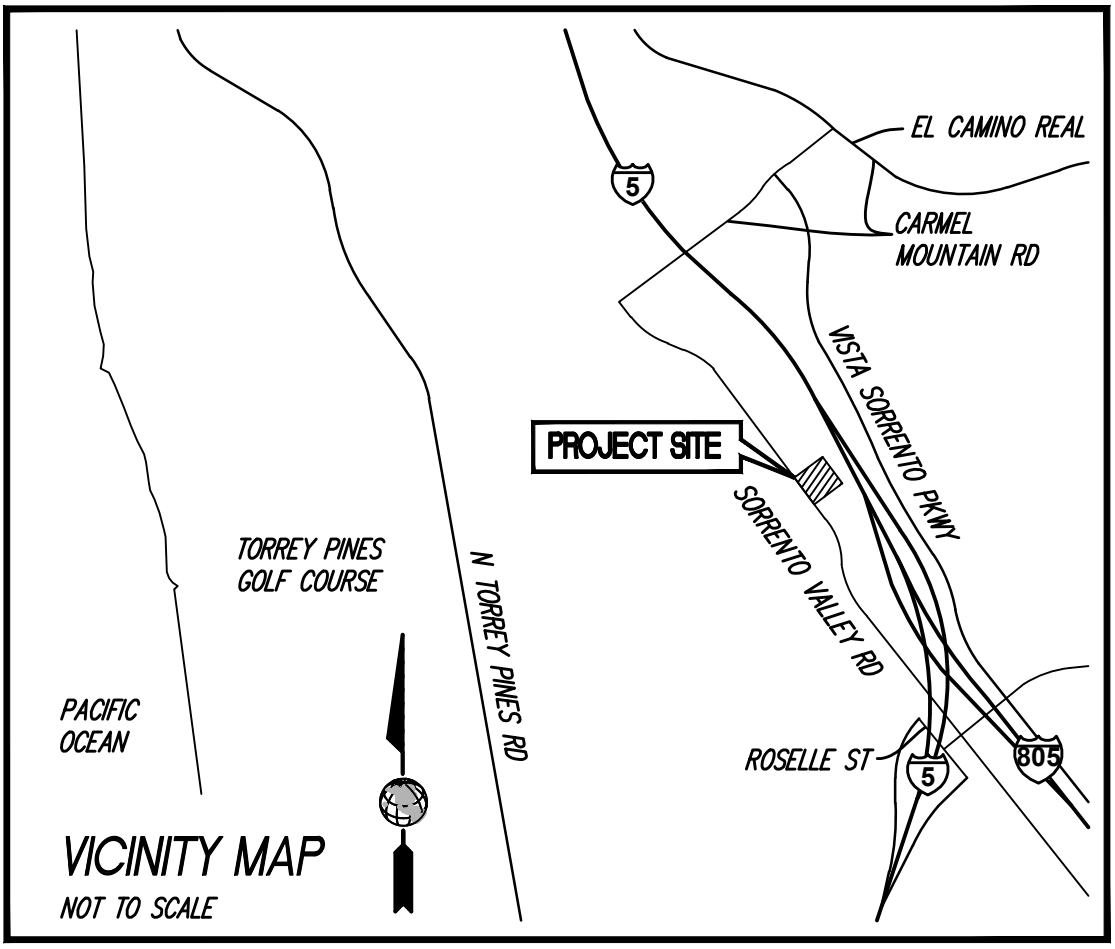
Confluenced Pt.	Tributary Flows	I_{100} (in/hr)	Tc (mins)	Q_{100} (cfs)	Confluenced Flow (cfs)
CP-1	P-2	6.59	5.0	0.11	0.60
	O-1	6.59	5.0	0.49	
DP-1	CP-1	6.59	5.0	0.60	8.45
	P-1	6.59	5.0	7.85	

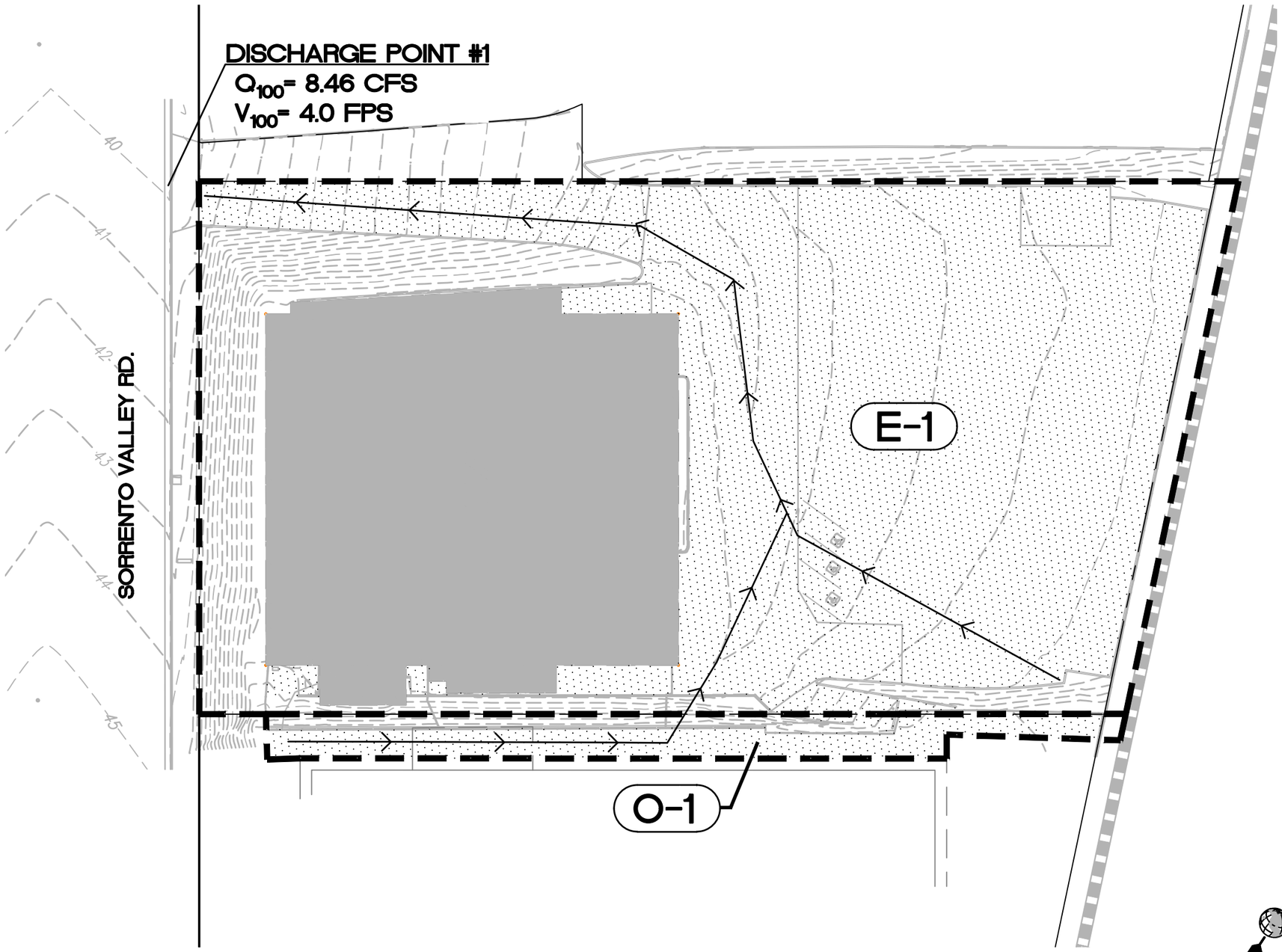
The confluence peak flowrate for Discharge Point #1 is 8.45 cfs for the 100-yr storm event. See the attached calculations for details.

Results and Conclusions

The proposed improvements result in a decrease of generated runoff during the peak of the 100-year, 6-hr storm. The result is a peak storm water flowrate that is less than the existing conditions by 0.01 cfs.

Project does not propose to discharge fill or dredged materials to the Waters of the State, therefore no CWA 401 or 404 permit is required. It is the opinion of Omega Engineering Consultants that the project will not cause adverse effects to the downstream facilities or receiving waters. A separate Storm Water Quality Management Plan has been prepared to discuss the water quality impacts for the proposed development.


EL CAMINO REAL
5
CARMEL
MOUNTAIN RD
VISTA SORRENTO PKWY
PROJECT SITE
SORRENTO VALLEY RD
TORREY PINES
GOLF COURSE
N TORREY PINES RD
PACIFIC
OCEAN
ROSELLE ST
5
805
VICINITY MAP
NOT TO SCALE



LEGEND

- BASIN NUMBER ..... E-#
- AREA LIMITS .....
- DRAINAGE FLOW PATH .....
- BUILDING AREA .....
- PAVEMENT AREA .....
- PERVIOUS AREA .....

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	C-VALUE	T_C (MINS)	I_{100} (IN/HR)	Q_{100} (CFS)
E-1	1.50	0.81	5.0	6.59	7.97
O-1	0.10	0.90	5.0	6.59	0.42

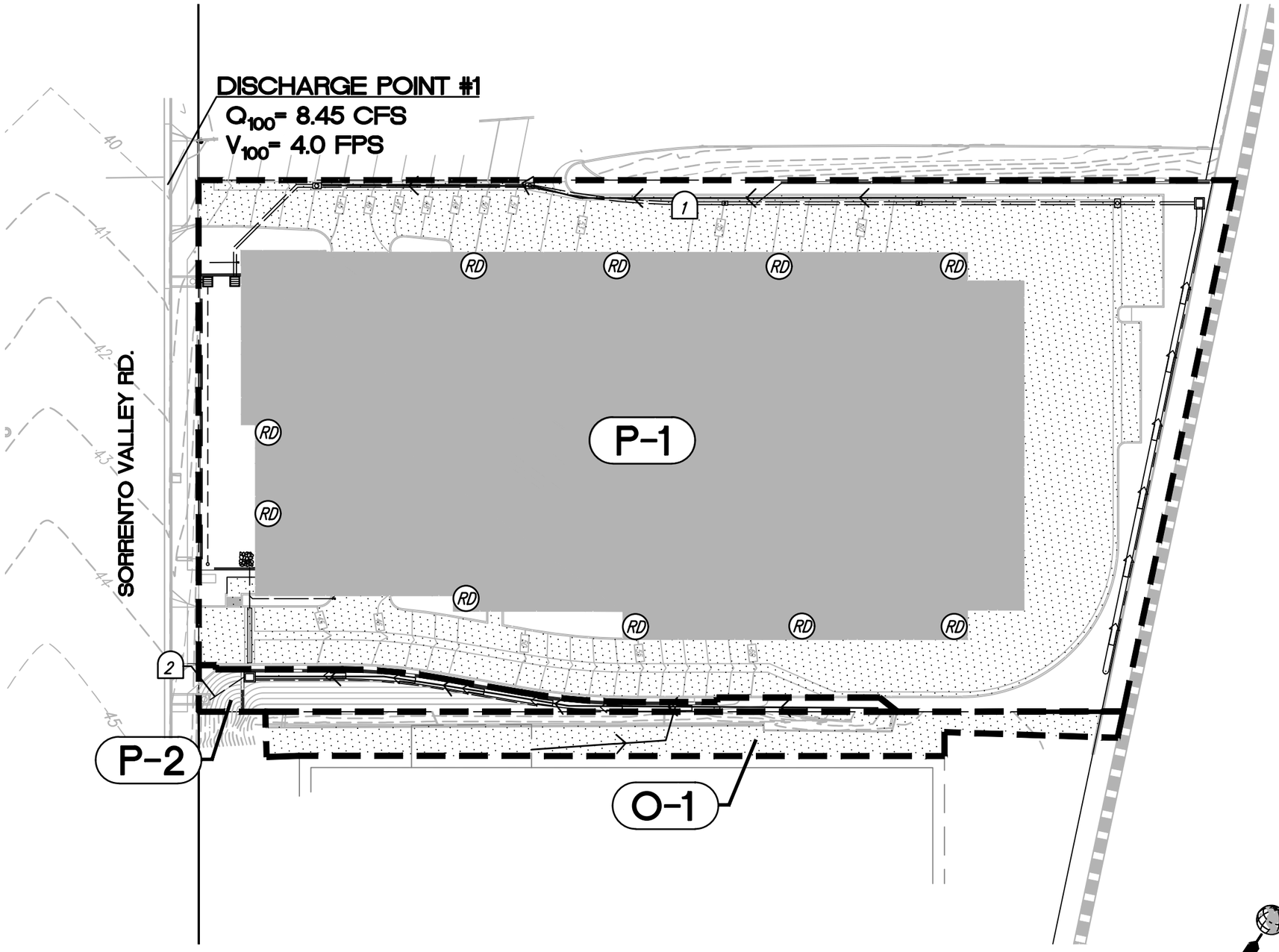
GRAPHICAL SCALE: 1" = 40'

0 20 40 80

U-STOR IT
SORRENTO VALLEY
EXISTING HYDROLOGY
EXHIBIT

OMEGA

EX. HYDROLOGY EXHIBIT



LEGEND

- BASIN NUMBER ..... P-#
- AREA LIMITS .....
- DRAINAGE FLOW PATH .....
- BUILDING AREA .....
- PAVEMENT AREA .....
- PERVIOUS AREA .....

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	C-VALUE	T_C (MINS)	I_{100} (IN/HR)	Q_{100} (CFS)
P-1	1.45	0.82	5.0	6.59	7.85
P-2	0.05	0.35	5.0	6.59	0.11
O-1	0.10	0.75	5.0	6.59	0.49

(X) PIPE DATA

PIPE #	DIAMETER (INCHES)	SLOPE (%)	DEPTH /DIA	V_{100} (FPS)	Q_{100} (CFS)
1	12	4.9	0.47	9.93	3.60
2	8	10	0.26	8.32	0.60

U-STOR IT
SORRENTO VALLEY
PROPOSED HYDROLOGY EXHIBIT

GRAPHICAL SCALE: 1" = 40'

0 20 40 80

OMEGA

PROP. HYDROLOGY EXHIBIT

U-STOR-IT SORRENTO VALLEY
HYDROLOGY AND HYDRAULICS CALCS

BASIN	AREA (SF)	AREA (AC)	% Imp	"C" Value
E-1	65,246	1.50	83%	0.81
O-1	4,271	0.10	73%	0.75
EX. TOTAL	**69,517**	**1.60**		
P-1	63,132	1.45	86%	0.82
P-2	2,114	0.05	0%	0.35
O-1	4,271	0.10	73%	0.75
PROP TOTAL	**69,517**	**1.60**		

Basin Confluence	Symbol
EXISTING	
(E-1 & O-1)	DP-1
PROPOSED	
(P-2 & O-1)	CP-1
(CP-1 & P-1)	DP-2

(A) ECP # - Existing Confluence Point

(B) CP # - Proposed Confluence Point

(C) C value for bare ground is 0.35 (Table 3-1 County Hydrology Manual) (Type 'D' soil)

C value for impervious surfaces is 0.9

Basins with mixed surface type use a weighted average of these 2 values. (impervious % x 0.9)+(pervious % x 0.35)

U-STOR-IT SORRENTO VALLEY
HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)

Sub-Basin	AREA Ac.	"C"	Overland flow length	Concentrated Flow Length, (ft)	S(%) (avg.)	Ti mins	Tt mins	T_c mins	I in/hr	Q cfs	NOTES 85th Percentile
E-1	1.50	0.81	400.0	310.0	5.0%	2.9	1.2	5.0	0.20	0.24	
O-1	0.10	0.75	150.0	90.0	1.0%	4.1	0.0	5.0	0.20	0.01	
								5.0	**0.20**	**0.26**	**Discharge Point-1**
P-1	1.45	0.82	270.0	170.0	7.8%	2.4	1.4	5.0	0.20	0.24	
P-2	0.05	0.35	222.0	147.0	2.3%	3.6	0.89	5.0	0.20	0.003	
O-1	0.10	0.75	60.0	90.0	1.0%	4.1	0.0	5.0	0.20	0.01	No Tt. Portions of the offsite basin sheet flow towards the landscape on P-1.
								5.0	**0.20**	**0.02**	**Confluence Point-1**
								5.0	**0.20**	**0.26**	**Discharge Point # 1**

U-STOR-IT SORRENTO VALLEY 9/27/2021

HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)

Sub-Basin	AREA Ac.	"C"	Overland flow length	Concentrated Flow Length, (ft)	S(%) (avg.)	Ti mins	Tt mins	T_c mins	I in/hr	Q cfs	NOTES 100-year, 6 hr storm
											P(6) 2.5
E-1	1.50	0.81	90.0	310.0	5.0%	2.9	1.2	5.0	6.59	7.98	
O-1	0.10	0.75	60.0	90.0	1.0%	4.1	0.0	5.0	6.59	0.49	
								5.0	**6.59**	**8.46**	**Discharge Point-1**
P-1	1.45	0.82	100.0	170.0	7.8%	2.4	1.4	5.0	6.59	7.85	
P-2	0.05	0.35	75.0	147.0	2.3%	3.6	0.9	5.0	6.59	0.11	
O-1	0.10	0.75	60.0	90.0	1.0%	4.1	0.0	5.0	6.59	0.49	No Tt. Portions of the offsite basin sheet flow towards the landscape on P-1.
								5.0	**6.59**	**0.60**	**Confluence Point-1**
								5.0	**6.59**	**8.45**	**Discharge Point # 1**

CONDUIT SIZING CALCULATIONS

The following chart details the sizing parameters and for conduits that convey runoff on the site.
Flow parameters from *Handbook of Hydraulics, King & Brater* were used, see following page.

K'= Discharge factor	=	$(Q*n)/(d^{8/3}*s^{1/2})$
n= Mannings coefficient	=	0.013 for PVC & HDPE
d=diameter of conduit (ft)	=	per chart
Q= Discharge	=	based off portions of basins tributary to outlet
s=Minimum Pipe Slope (ft/ft)	=	per chart
D=depth of flow	=	From table 7-4 of the *Handbook of Hydraulics, King & Brater* See right
C_a= Flow factor	=	From table 7-14 of the *Handbook of Hydraulics, King & Brater* See right
A=Cross sectional area of flow	=	C_a*d^2
V=Velocity	=	Q/A

Pipe Flow

Pipe	Tributary Areas	Q (cfs)	S (%)	d (in)	K'	D/d	C_a	A (sf)	V (fps)
1	**Northerly Portion Basin P-1**	3.60	4.9	12	0.2114	0.47	0.363	0.363	9.93
2	**Basins P-2 and O-1**	0.60	10	8	0.0727	0.26	0.162	0.072	8.32

Table 7-4. For Determining the Area a of the Cross Section of a Circular Conduit Flowing Part Full

Let $\frac{\text{depth of water}}{\text{diameter of channel}} = \frac{D}{d}$ and C_a = the tabulated value. Then $a = C_a d^2$.

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0000	.0013	.0037	.0069	.0105	.0147	.0192	.0242	.0294	.0350
.1	.0409	.0470	.0534	.0600	.0668	.0739	.0811	.0885	.0961	.1039
.2	.1118	.1199	.1281	.1365	.1449	.1535	.1623	.1711	.1800	.1890
.3	.1982	.2074	.2167	.2260	.2355	.2450	.2546	.2642	.2739	.2836
.4	.2934	.3032	.3130	.3229	.3328	.3428	.3527	.3627	.3727	.3827
.5	.393	.403	.413	.423	.433	.443	.453	.462	.472	.482
.6	.492	.502	.512	.521	.531	.540	.550	.559	.569	.578
.7	.587	.596	.605	.614	.623	.632	.640	.649	.657	.666
.8	.674	.681	.689	.697	.704	.712	.719	.725	.732	.738
.9	.745	.750	.756	.761	.766	.771	.775	.779	.782	.784

Table 7-14. Values of K' for Circular Channels in the Formula

$$Q = \frac{K'}{n} d^{8/3} s^{1/2}$$

D = depth of water d = diameter of channel

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0		.00007	.00031	.00074	.00138	.00222	.00328	.00455	.00604	.00775
.1	.00967	.0118	.0142	.0167	.0195	.0225	.0257	.0291	.0327	.0366
.2	.0406	.0448	.0492	.0537	.0585	.0634	.0686	.0738	.0793	.0849
.3	.0907	.0966	.1027	.1089	.1153	.1218	.1284	.1352	.1420	.1490
.4	.1561	.1633	.1705	.1779	.1854	.1929	.2005	.2082	.2160	.2238
.5	.232	.239	.247	.255	.263	.271	.279	.287	.295	.303
.6	.311	.319	.327	.335	.343	.350	.358	.366	.373	.380
.7	.388	.395	.402	.409	.416	.422	.429	.435	.441	.447
.8	.453	.458	.463	.468	.473	.477	.481	.485	.488	.491
.9	.494	.496	.497	.498	.498	.498	.496	.494	.489	.483
1.0	.463									

Appendix 1

County of San Diego Hydrology Manual

Soil Hydrologic Groups

Orange County

Riverside County

Imperial County

Mexico

Pacific Ocean

PROJECT SITE LOCATION
SOIL TYPE A

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

APPENDIX 1.0

Appendix 2

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

PROJECT SITE
P_6 = 2.5"

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

APPENDIX 2.0

Appendix 3

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

PROJECT SITE
P_{24} = 4.0"

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
POWAY
S.D. COUNTY
DEL MAR
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

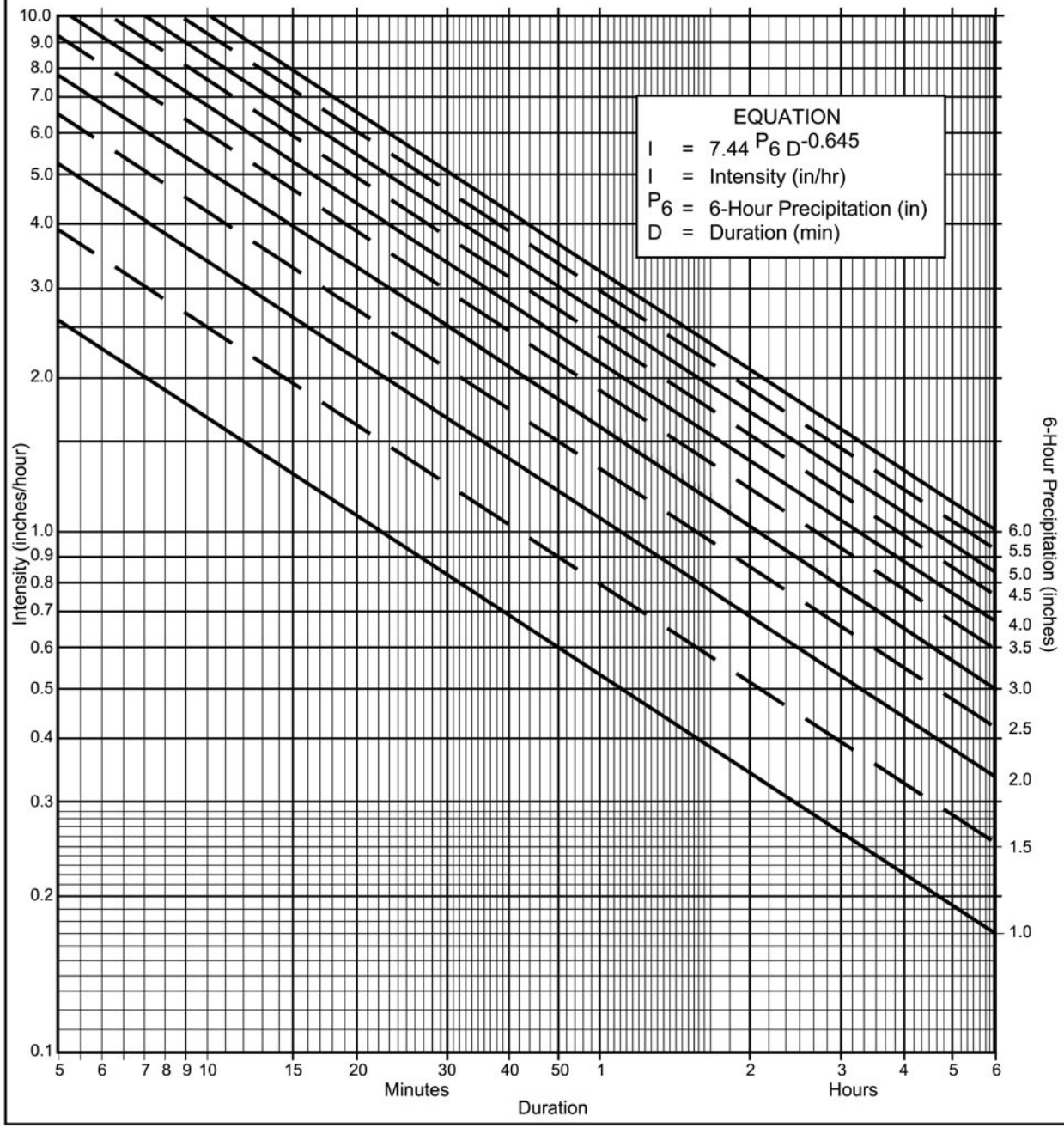
SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

APPENDIX 3.0

Appendix 4



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 2.5 in., P_{24} = 4.0, $\frac{P_6}{P_{24}}$ = 62.5 %(2)

(c) Adjusted P_6(2) = _____ in.

(d) t_x = _____ min. see calculations for values of each basin

(e) I = _____ in./hr. See methodology to see the equations used for Intensity and time of concentration

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

Appendix 5

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

Appendix 6

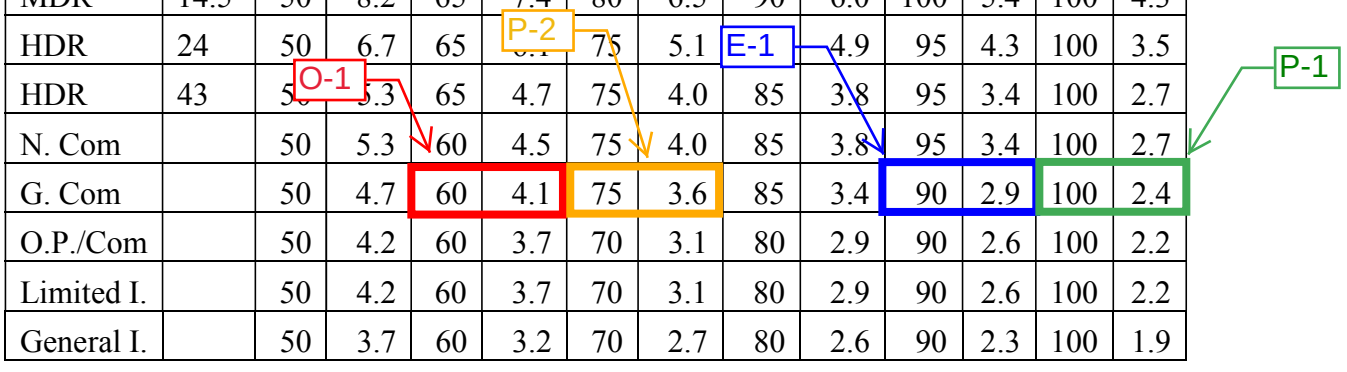
Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	[illegible]	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9



*See Table 3-1 for more detailed description

Appendix 7

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Aug 23 2021

Asphalt Swale - E-1

User-defined

Invert Elev (ft)	= 55.87
Slope (%)	= 5.10
N-Value	= Composite

Calculations

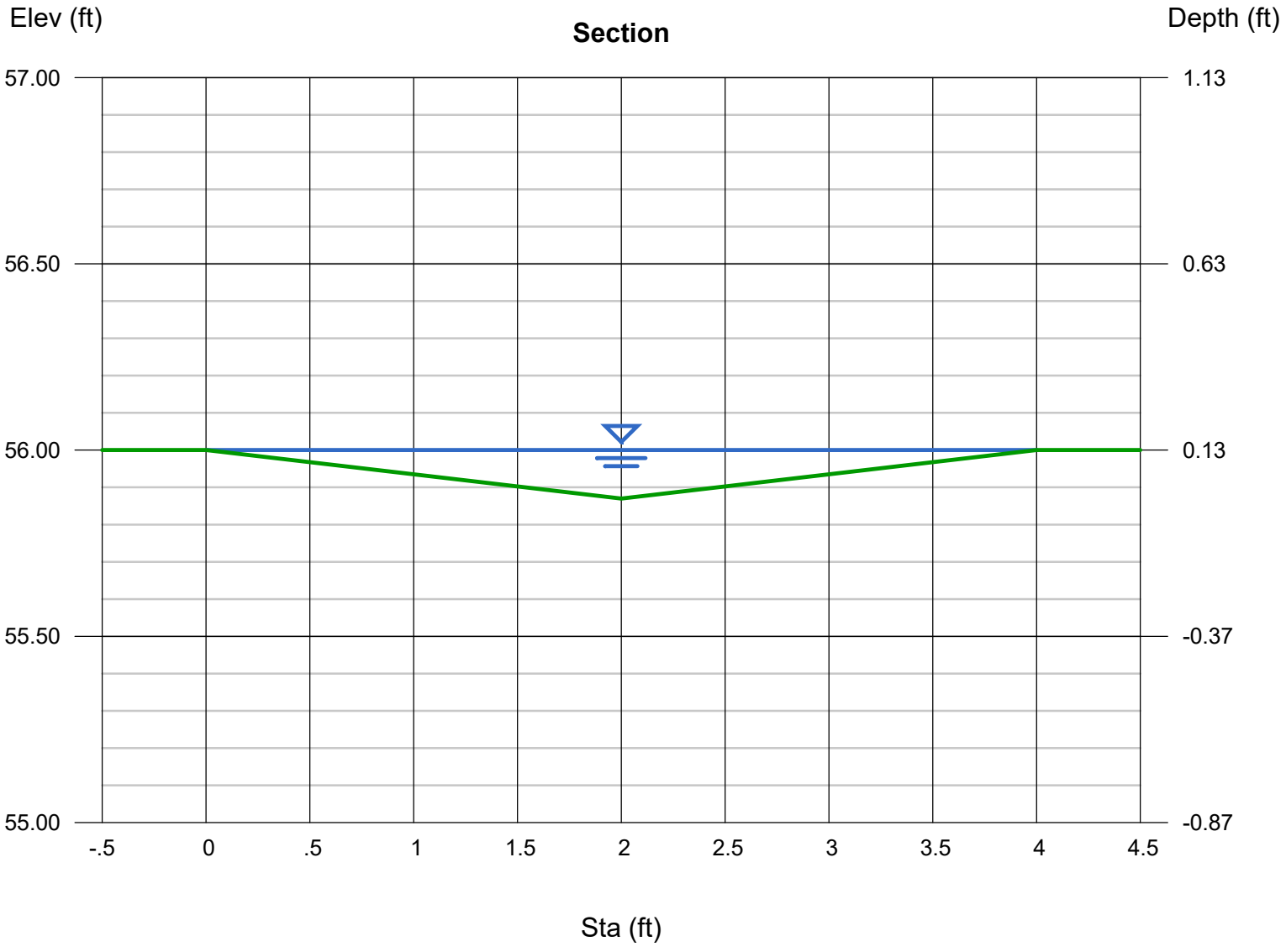
Compute by:	Q vs Depth
No. Increments	= 10

(Sta, El, n)-(Sta, El, n)...

(0.00, 56.00)-(2.00, 55.87, 0.013)-(4.00, 56.00, 0.013)

Highlighted

Depth (ft)	= 0.13
Q (cfs)	= 1.085
Area (sqft)	= 0.26
Velocity (ft/s)	= 4.17
Wetted Perim (ft)	= 4.01
Crit Depth, Yc (ft)	= 0.13
Top Width (ft)	= 4.00
EGL (ft)	= 0.40



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Aug 23 2021

Ribbon Gutter - P-1

User-defined

Invert Elev (ft)	= 44.87
Slope (%)	= 10.00
N-Value	= Composite

Calculations

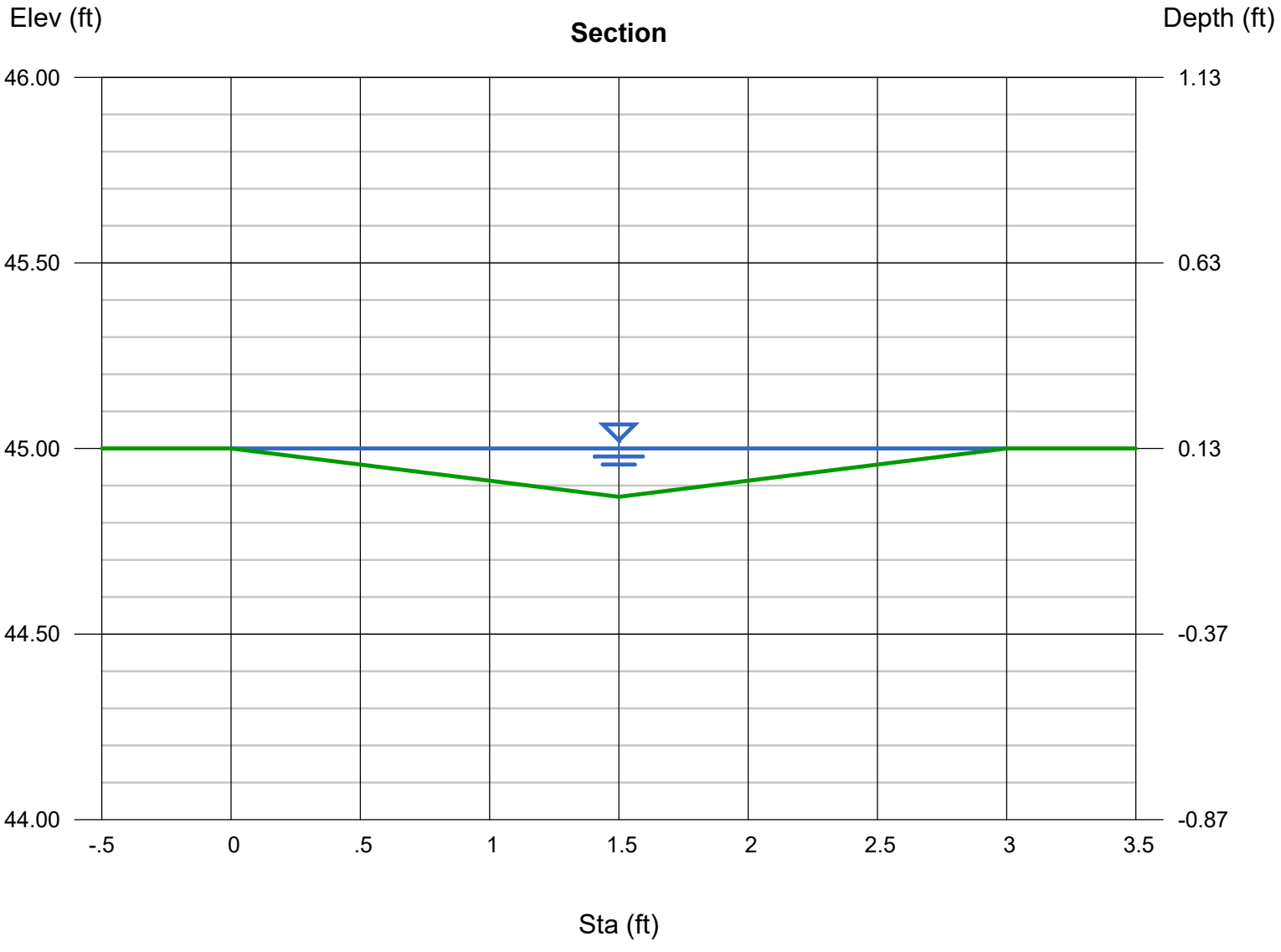
Compute by:	Q vs Depth
No. Increments	= 10

(Sta, El, n)-(Sta, El, n)...

(0.00, 45.00)-(1.50, 44.87, 0.013)-(3.00, 45.00, 0.013)

Highlighted

Depth (ft)	= 0.13
Q (cfs)	= 1.138
Area (sqft)	= 0.20
Velocity (ft/s)	= 5.84
Wetted Perim (ft)	= 3.01
Crit Depth, Yc (ft)	= 0.13
Top Width (ft)	= 3.00
EGL (ft)	= 0.66



Attachment 6
Geotechnical and Groundwater Investigation Report

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

GEOTECHNICAL INVESTIGATION

U STOR IT – TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA

PREPARED FOR

CHICAGO CAPITAL FUNDS, LLC
SAN DIEGO, CALIFORNIA

MARCH 8, 2022
PROJECT NO. G2740-52-01

Project No. G2740-52-01
March 8, 2022

Chicago Capital Funds, LLC
501 W. Broadway STE 2020
San Diego, California 92101

Attention: Mr. Larry Nora

Subject: GEOTECHNICAL INVESTIGATION
U STOR IT – TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA

Dear Mr. Nora:

In accordance with your request and authorization of our Proposal No. LG-21239 dated May 11, 2021, we herein submit the results of our geotechnical investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions and potential geologic hazards, and to assist in the design of the proposed building and associated improvements.

The accompanying report presents the results of our study and conclusions and recommendations pertaining to geotechnical aspects of the proposed project. The site is suitable for the proposed buildings and improvements provided the recommendations of this report are incorporated into the design and construction of the planned project.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Matt Love
RCE 84154

Shawn Foy Weedon
GE 2714

John Hoobs
CEG 1524

ML:SFW:JH:arm

(e-mail) Addressee

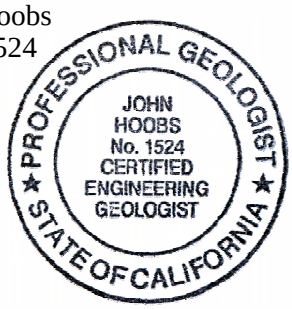


TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of our geotechnical investigation for the proposed self-storage facility located in the Sorrento Valley area of San Diego, California (see Vicinity Map).

Vicinity Map

The purpose of the geotechnical investigation is to evaluate the surface and subsurface soil conditions and general site geology, and to identify geotechnical constraints that may affect development of the property including faulting, liquefaction and seismic shaking based on the 2019 CBC seismic design criteria. In addition, we provided recommendations for remedial grading, shallow foundations, concrete slab-on-grade, temporary shoring, concrete flatwork, preliminary pavement, and retaining walls.

The scope of this investigation included reviewing readily available published and unpublished geologic literature (see List of References), performing engineering analyses and preparing this report. We also advanced 6 exploratory borings to a maximum depth of about 23 feet, sampled soil and performed laboratory testing. Appendix A presents the exploratory boring logs and details of the field

investigation. The details of the laboratory tests and a summary of the test results are shown in Appendix B and on the boring logs in Appendix A. The results of our Storm Water Management Investigation are provided in a separate report.

2. SITE AND PROJECT DESCRIPTION

The subject property is located at 11391 Sorrento Valley Road in San Diego, California and is located north and south of existing commercial buildings, west of Interstate 5 and east of Sorrento Valley Road. The site is occupied by a single-story commercial building with accommodating driveways, surface parking, utilities and landscaping. We expect the existing structure is supported on conventional shallow foundations with a concrete slab-on-grade. The property is relatively flat at an elevation of about 60 to 65 feet above Mean Sea Level (MSL) at the southwest and northeast ends of the site, respectively. A 10- to 15-foot fill slope exists on the western portion of the site that descends to Sorrento Valley Road. A retaining wall (about 30 feet high) is present on the east side of the property that supports the adjacent Interstate 5 Bypass. The Existing Site Plan shows the current site configuration.

Existing Site Map

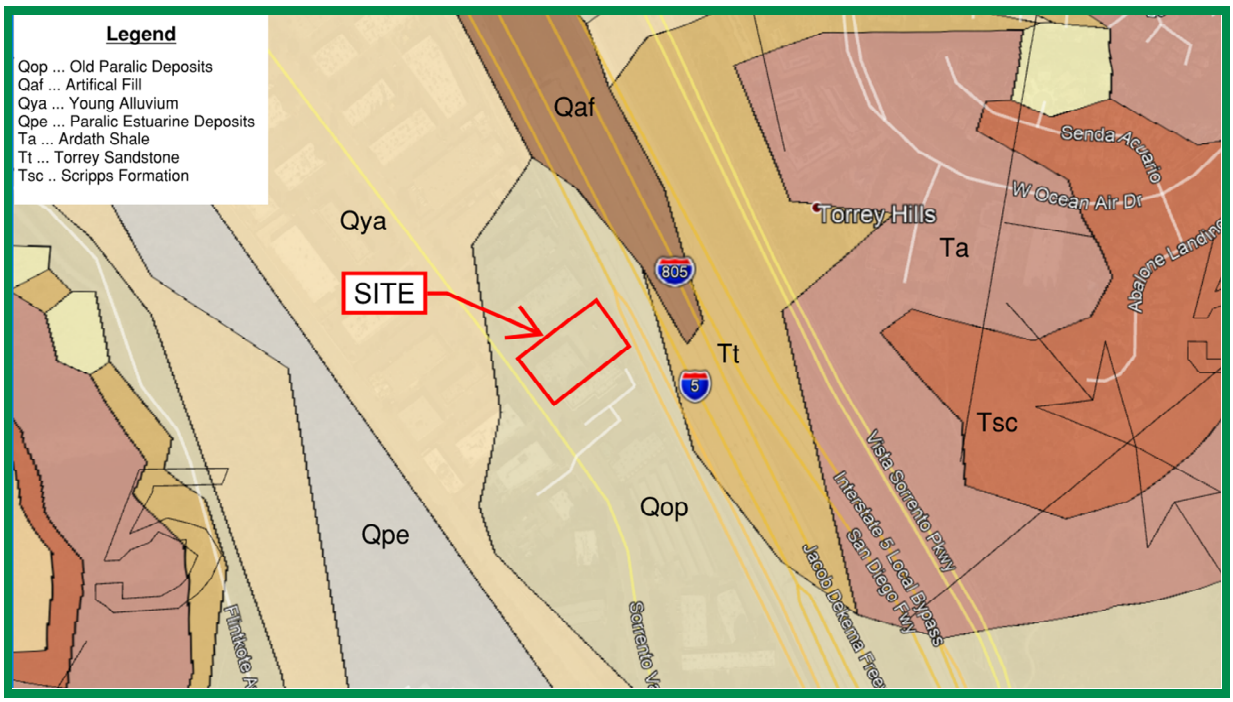
We understand the project will consist of demolishing the existing structure and improvements at the site and constructing a new self-storage facility. Based on the referenced plans, we understand the proposed building will be 2 to 4 stories above grade situated over 1 to 3 subterranean levels. The site development will also include utilities, sidewalks and other associated improvements.

The locations, site descriptions, and proposed development are based on our site reconnaissance, review of published geologic literature, field investigations, and discussions with project personnel. If development plans differ from those described herein, Geocon Incorporated should be contacted for review of the plans and possible revisions to this report.

3. GEOLOGIC SETTING

Regionally, the site is located in the Peninsular Ranges geomorphic province. The province is bounded by the Transverse Ranges to the north, the San Jacinto Fault Zone on the east, the Pacific Ocean coastline on the west, and the Baja California on the south. The province is characterized by elongated northwest-trending mountain ridges separated by straight-sided sediment-filled valleys. The northwest trend is further reflected in the direction of the dominant geologic structural features of the province that are northwest to west-northwest trending folds and faults, such as the nearby Rose Canyon fault zone.

Locally, the site is within the coastal plain of San Diego County. The coastal plain is underlain by a thick sequence of relatively undisturbed and non-conformable sedimentary bedrock units that thicken to the west and range in age from Upper Cretaceous age through the Pleistocene age which have been deposited on Cretaceous to Jurassic age igneous and volcanic bedrock. Geomorphically, the coastal plain is characterized by a series of twenty-one, stair-stepped marine terraces (younger to the west) that have been dissected by west flowing rivers. The coastal plain is a relatively stable block that is dissected by relatively few faults consisting of the potentially active La Nacion Fault Zone and the active Rose Canyon Fault Zone. The Regional Geologic Map shows the geologic units in the area of the site.



Regional Geologic Map

The site is located on the western portion of the coastal plain. Marine sedimentary units make up the geologic sequence encountered on the site and consist of Pleistocene-age Old Paralic Deposits. The Old Paralic Deposits are upper Pleistocene-age shallow marine and non-marine deposits generally consisting of clayey sand and silty sand interfingered with layers of silt and clay. This unit is likely underlain by Torrey Sandstone.

4. SOIL AND GEOLOGIC CONDITIONS

Based on our review of published geologic maps and previous investigations near the site, we expect the site is underlain by one surficial soil type (consisting of undocumented fill) and two formational units (consisting of the Old Paralic Deposits and the Torrey Sandstone). The occurrence, distribution, and description of each unit encountered is shown on the Geologic Map, Figure 1 and on the boring logs in Appendix A. The Geologic Cross-Section, Figure 2, shows the approximate subsurface relationship between the geologic units. We prepared the geologic cross-section using interpolation between exploratory excavations and observations; therefore, actual geotechnical conditions may vary from those illustrated and should be considered approximate. The surficial soil and geologic units are described herein in order of increasing age.

4.1 Undocumented Fill (Qudf)

We expect shallow undocumented fill, associated with the existing building and site improvements, is present across the majority of the site. The fill is likely 2 to 4 feet thick with larger fills on the order of 10 to 15 feet along the western side of the site in the area of the existing fill slope. The fill generally consists of very loose to medium dense, silty to clayey sand. The undocumented fill is not considered suitable in its current condition for the support of foundations or structural fill and remedial grading will required. We expect that the majority of the undocumented fill will be removed during site excavations for the building subterranean levels. The undocumented fill can be reused for new compacted fill during grading operations, if necessary, provided it is generally free of roots and debris.

4.2 Old Paralic Deposits (Qop)

The Quaternary-age Old Paralic Deposits is near the surface on the east side of the site and is below the undocumented fill. The Old Paralic Deposits generally consist of moderately cemented, very dense, yellowish brown to reddish brown, silty to clayey, fine-grained sand and sandy clay. This unit also possesses interfingered beds of silt/sandy silt and moderately cemented gravel and cobble layers. We encountered abundant gravel and refusal during our drilling operations. The Old Paralic Deposits possess a “very low” to “medium” expansion potential (expansion index of 90 or less). Old Paralic Deposits are considered suitable for direct support of structural loads.

4.3 Torrey Sandstone (Tt)

Although not encountered during our drilling operations, we expect that formational materials of the Tertiary-age Torrey Sandstone underlie the Old Paralic Deposits at depths greater than 30 feet below existing grade (elevation of about 30 feet MSL). The Torrey Sandstone consists of dense to very dense, damp to wet, olive to yellowish and reddish brown, uncemented, fine to medium sandstone and weakly to strongly cemented, fine- to medium-grained sandstone with local, thin interbeds of sandy siltstone. Soil generated from this formation generally possesses a "very low" to "low" expansive potential (expansion index of 50 or less). We consider the formational materials to be adequate for the support of structural loads and compacted fill.

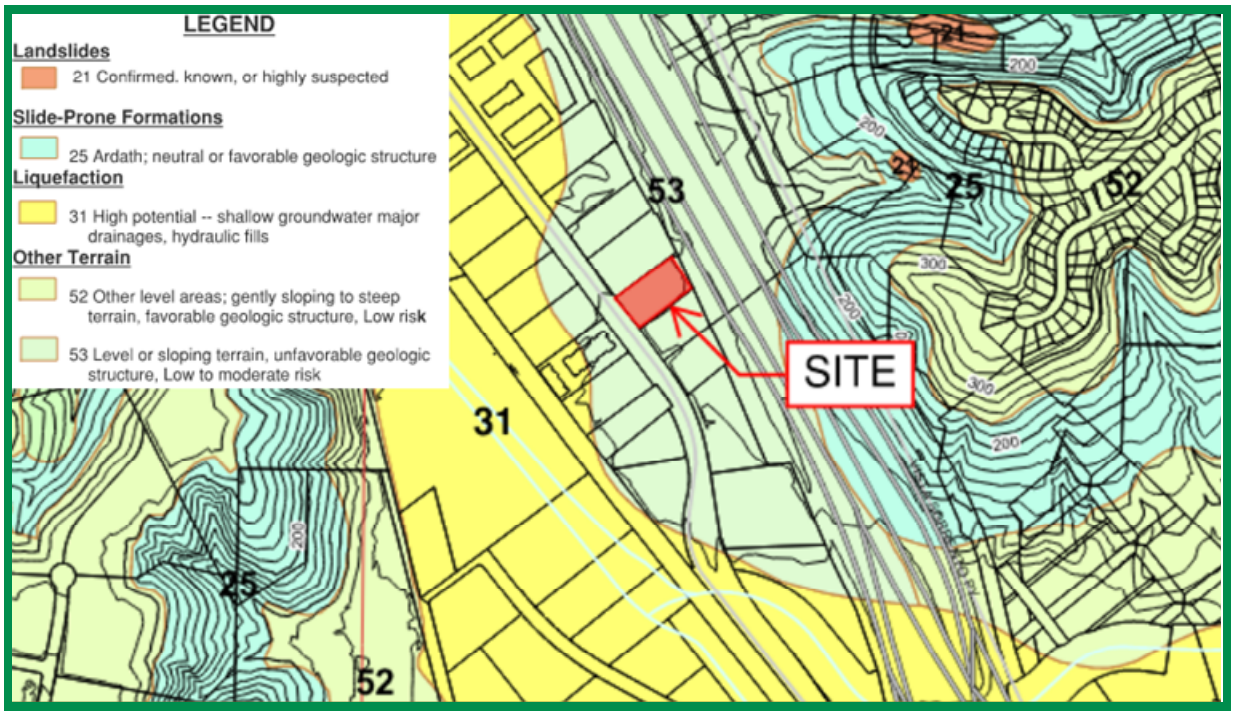
5. GROUNDWATER

We did not encounter groundwater or seepage during our site investigation. A river exists about 800 feet to the west that has a water elevation of about 25 feet MSL; therefore, we expect groundwater is situated at least 30 feet below existing grade based on our previous experience within the project area. However, it is not uncommon for shallow seepage conditions to develop where none previously existed when sites are irrigated or infiltration is implemented. Seepage is dependent on seasonal precipitation, irrigation, land use, among other factors, and varies as a result. Proper surface drainage will be important to future performance of the project. We do not expect groundwater to be encountered during construction of the proposed development due to the dense formational materials. However, the contractor should be prepared for the potential of minor to heavy seepage during excavations for the building subterranean levels.

6. GEOLOGIC HAZARDS

6.1 Geologic Hazard Category

The City of San Diego Seismic Safety Study, Geologic Hazards and Faults, Sheet 34 defines the site with *Hazard Category 53: Level or sloping terrain, unfavorable geologic structure, Low to moderate Risk* (as shown on the Hazard Category Map). Based on a review of the map, a fault does not traverse the planned development area.



Hazard Category Map

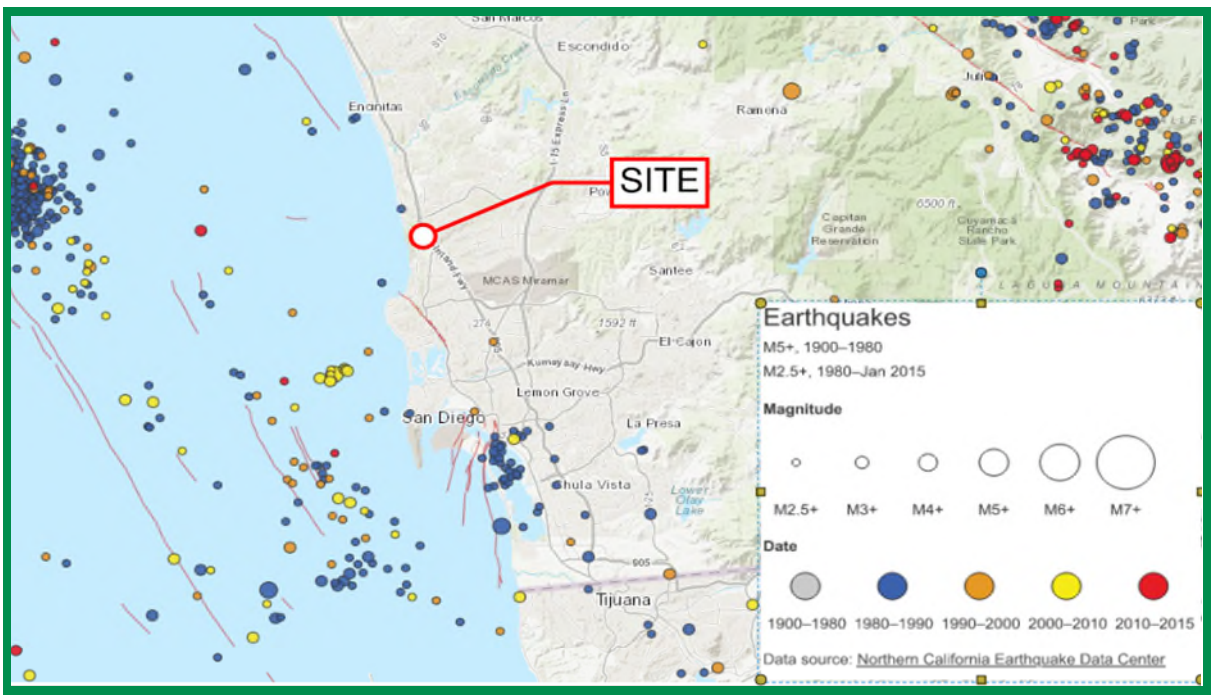
6.2 Regional Faulting and Seismicity

A review of the referenced geologic materials and our knowledge of the general area indicate that the site is not underlain by active, potentially active, or inactive faults. An active fault is defined by the California Geological Survey (CGS) as a fault showing evidence for activity within the last 11,700 years. The site is not located within a State of California Earthquake Fault Zone.

The USGS has developed a program to evaluate the approximate location of faulting in the area of properties. The following figure shows the location of the existing faulting in the San Diego County and Southern California region. The fault traces are shown as solid, dashed and dotted that represent well-constrained, moderately constrained and inferred, respectively. The fault line colors represent fault with ages less than 150 years (red), 15,000 years (orange), 130,000 years (green), 750,000 years (blue) and 1.6 million years (black).

Faults in Southern California

The San Diego County and Southern California region is seismically active. The following figure presents the occurrence of earthquakes with a magnitude greater than 2.5 from the period of 1900 through 2015 according to the Bay Area Earthquake Alliance website.



Earthquakes in Southern California

Considerations important in seismic design include the frequency and duration of motion and the soil conditions underlying the site. Seismic design of structures should be evaluated in accordance with the California Building Code (CBC) guidelines currently adopted by the local agency.

6.3 Ground Rupture

Ground surface rupture occurs when movement along a fault is sufficient to cause a gap or rupture where the upper edge of the fault zone intersects the ground surface. The potential for ground rupture is considered to be very low due to the absence of active faults at the subject site.

6.4 Liquefaction

Liquefaction typically occurs when a site is located in a zone with seismic activity, onsite soils are cohesionless or silt/clay with low plasticity, groundwater is encountered within 50 feet of the surface and soil densities are less than about 70 percent of the maximum dry densities. If the four previous criteria are met, a seismic event could result in a rapid pore water pressure increase from the earthquake-generated ground accelerations. Due to the lack of a permanent, near-surface groundwater table and the very dense nature of the underlying Old Paralic Deposits, liquefaction potential for the site is considered very low.

6.5 Hydrocollapse

Hydrocollapse is the tendency of unsaturated soil structure to collapse upon saturation resulting in the overall settlement of the effected soil and overlying foundations or improvements supported thereon. Potentially compressible surficial soil underlying the proposed structures and existing fill is typically removed and recompacted during remedial site grading. However, if compressible soil is left in-place, a potential for settlement due to hydrocollapse of the soil exists. The potential for hydrocollapse can be mitigated by remedial grading and the use of stiffer foundation systems. Based on the laboratory test results, the potential for hydrocollapse ranges from 0 percent to 2 percent within the sandy portions of the Old Paralic Deposits. We expect the majority of these materials to be removed during excavations for the subterranean levels. Therefore, we consider the potential for hydrocollapse at the site to be minimal.

6.6 Storm Surge, Tsunamis, and Seiches

Storm surges are large ocean waves that sweep across coastal areas when storms make landfall. Storm surges can cause inundation, severe erosion and backwater flooding along the water front. The site is located approximately 1½ miles from the Pacific Ocean and is at an elevation of above about 40 feet MSL. Therefore, the potential of storm surges affecting the site is considered negligible.

A tsunami is a series of long period waves generated in the ocean by a sudden displacement of large volumes of water. Causes of tsunamis include underwater earthquakes, volcanic eruptions, or offshore slope failures. The first-order driving force for locally generated tsunamis offshore southern California is expected to be tectonic deformation from large earthquakes (Legg, *et al.*, 2002). We consider the risk of a tsunami hazard at the site to be negligible due to the distance from the ocean and the site elevation.

A seiche is a run-up of water within a lake or embayment triggered by fault- or landslide-induced ground displacement. The site is not located near an inland body of water. Therefore, we consider the potential for seiches to impact the site is very low.

6.7 Landslides

We did not observe evidence of previous or incipient slope instability at the site during our study and the property is relatively flat. Published geologic mapping indicates landslides are not present on or adjacent to the site. Therefore, we opine the potential for a landslide is not a significant concern for this project.

6.8 Erosion

The site is relatively flat and is not located adjacent to the Pacific Ocean coast or a free-flowing drainage where active erosion is occurring. Provided the engineering recommendations herein are followed and the project civil engineer prepares the grading plans in accordance with generally-accepted regional standards, we do not expect erosion to be a major impact to site development. In addition, we expect the proposed development would not increase the potential for erosion if properly designed.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

7.1.1 We did not encounter soil or geologic conditions during our exploration that would preclude the proposed development, provided the recommendations presented herein are followed and implemented during design and construction. We will provide supplemental recommendations if we observe variable or undesirable conditions during construction, or if the proposed construction will differ from that anticipated herein.

7.1.2 With the exception of possible moderate to strong seismic shaking, we did not observe or know of significant geologic hazards to exist on the site that would adversely affect the proposed project.

7.1.3 The undocumented fill is potentially compressible and unsuitable in the present condition for the support of compacted fill or settlement-sensitive improvements. We expect these materials will be removed during excavations for the building subterranean levels. However, where left in place, remedial grading of these materials should be performed as discussed herein. The Old Paralic Deposits are considered suitable for the support of proposed fill and structural loads.

7.1.4 We did not encounter groundwater during our subsurface exploration and we do not expect it to be a constraint to project development. However, seepage within existing materials may be encountered during the subterranean-level excavation and grading operations, especially during the rainy seasons.

7.1.5 Excavation of the undocumented fill and Old Paralic Deposits should generally be possible with moderate to heavy effort using conventional, heavy-duty equipment during grading and trenching operations. We expect very heavy effort with possible refusal in localized areas for excavations into strongly cemented portions of the Old Paralic Deposits and Torrey Sandstone, if encountered.

7.1.6 Proper drainage should be maintained in order to preserve the engineering properties of the fill in both the building pads and slope areas. Recommendations for site drainage are provided herein.

7.1.7 We performed a storm water management investigation under a separate report to help evaluate the potential for infiltration on the property. The project civil engineer should use that report to help design the storm water management devices.

7.1.8 We opine the planned development can be constructed in accordance with our recommendations provided herein. We do not expect the planned development will destabilize or result in settlement of adjacent properties if properly constructed.

7.1.9 Surface settlement monuments and canyon subdrains will not be required on this project.

7.2 Excavation and Soil Characteristics

7.2.1 Excavation of the in-situ soil should be possible with moderate to heavy effort using conventional heavy-duty equipment. Excavation of the formational materials will require very heavy effort and may generate abundant gravel, rock and oversized material using conventional heavy-duty equipment during the grading operations. Oversized rock (rocks greater than 12-inches in dimension) may be generated with the Old Paralic Deposits that can be incorporated into landscape use or deep compacted fill areas, if available.

7.2.2 The soil encountered in the field investigation is considered to be "non-expansive" and "expansive" (expansion index [EI] of 20 or less and greater than 20, respectively) as defined by 2019 California Building Code (CBC) Section 1803.5.3. We expect a majority of the soil encountered possess a "very low" to "medium" expansion potential (EI of 90 or less) in accordance with ASTM D 4829. Table 7.2 presents soil classifications based on the expansion index.

TABLE 7.2
EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	ASTM D 4829 Expansion Classification	2019 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

7.2.3 We performed laboratory tests on samples of the site materials to evaluate the percentage of water-soluble sulfate content. Appendix B presents results of the laboratory water-soluble sulfate content tests. The test results indicate the on-site materials at the locations tested possess "S0" sulfate exposure to concrete structures as defined by 2019 CBC Section 1904 and ACI 318-14 Chapter 19.

7.2.4 We tested samples for potential of hydrogen (pH) and resistivity laboratory tests to aid in evaluating the corrosion potential to subsurface metal structures. Appendix B presents the laboratory test results.

7.2.5 Geocon Incorporated does not practice in the field of corrosion engineering. Therefore, further evaluation by a corrosion engineer may be performed if improvements susceptible to corrosion are planned.

7.3 Grading

7.3.1 Grading should be performed in accordance with the recommendations provided in this report, the Recommended Grading Specifications contained in Appendix C and the City of San Diego's Grading Ordinance. Geocon Incorporated should observe the grading operations on a full-time basis and provide testing during the fill placement.

7.3.2 Prior to commencing grading, a preconstruction conference should be held at the site with the city inspector, developer, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and/or the grading plans can be discussed at that time.

7.3.3 Site preparation should begin with the removal of deleterious material, debris, and vegetation. The depth of vegetation removal should be such that material exposed in cut areas or soil to be used as fill is relatively free of organic matter. Material generated during stripping and/or site demolition should be exported from the site. Asphalt and concrete should not be mixed with the fill soil unless approved by the Geotechnical Engineer.

7.3.4 Abandoned foundations and buried utilities (if encountered) should be removed and the resultant depressions and/or trenches should be backfilled with properly compacted material as part of the remedial grading if located below the proposed improvements.

7.3.5 We expect excavations for the planned building and subterranean parking garage will remove the existing undocumented fill and expose the underlying Old Paralic Deposits. The excavations can be performed to finish grade for the subterranean parking level without performing remedial grading operations if Old Paralic Deposits are present at the pad elevations. If the bottom of the excavation is disturbed during excavation and export operations, then processing and compaction of the finish grade soil will be required. We will evaluate if additional removals below the building area will be required during the grading operations.

7.3.6 In areas of proposed ancillary structures and improvements outside of the building areas (trash enclosure, concrete flatwork and driveways), the upper 1 to 2 feet of the existing materials should be removed and replaced with properly compacted fill materials. Deeper removals may be required in areas where loose or saturated materials are encountered. The removals should extend at least 2 feet outside of the improvement area, where possible. Table 7.3.1 provides a summary of the grading recommendations.

TABLE 7.3.1
SUMMARY OF GRADING RECOMMENDATIONS

Area	Grading Excavation Requirements
Building Pad	Excavate to Pad Grade
Ancillary Structures and Improvement Areas	Process Upper 1 to 2 Feet of Existing Materials
Grading Limits	2 Feet Outside of Improvement Areas, Where Possible
Exposed Bottoms of Remedial Grading (Not within Building Pad)	Scarify Upper 12 Inches

7.3.7 Prior to fill soil being placed (where necessary), the existing ground surface should be scarified, moisture conditioned as necessary, and compacted to a depth of at least 12 inches. Deeper removals may be required if saturated or loose fill soil is encountered. A representative of Geocon should be on-site during removals to evaluate the limits of the remedial grading.

7.3.8 Fill and backfill materials should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM Test Method D 1557. The upper 12 inches of fill beneath pavement areas should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content shortly before paving operations.

7.3.9 While we do not anticipate that groundwater will be encountered during site excavations, the contractor should be prepared to accommodate seepage in project excavations with one or more of the following conventional measures, if needed. Where minor seepage is encountered during excavation, sloping excavation bottoms to a sump and pumping from the sump can be utilized. In this case, an approximately 1-foot-thick layer of freely draining gravel or crushed rock placed on the excavation bottom would help groundwater to flow toward the sump and provide a working pad. If migration of contaminates along a utility alignment is a concern, a 12-inch wide bentonite slurry barrier can be installed every 20 feet of trench as part of the excavation bottom. A sump would need to be installed within that 20-foot length in order to remove water during construction.

7.3.10 Import fill (if necessary) should consist of the characteristics presented in Table 7.3.2. Geocon Incorporated should be notified of the import soil source and should perform laboratory testing of import soil prior to its arrival at the site to determine its suitability as fill material.

TABLE 7.3.2
SUMMARY OF IMPORT FILL RECOMMENDATIONS

Soil Characteristic	Values
Expansion Potential	"Very Low" to "Medium" (Expansion Index of 90 or less)
Particle Size	Maximum Dimension Less Than 3 Inches
	Generally Free of Debris

7.4 Excavation Slopes, Shoring and Tiebacks

7.4.1 The recommendations included herein are provided for stable excavations. It is the responsibility of the contractor and their competent person to ensure all excavations, temporary slopes and trenches are properly constructed and maintained in accordance with applicable OSHA guidelines in order to maintain safety and the stability of the excavations and adjacent improvements. These excavations should not be allowed to become saturated or to dry out. Surcharge loads should not be permitted to a distance equal to the height of the excavation from the top of the excavation. The top of the excavation should be a minimum of 15 feet from the edge of existing improvements. Excavations steeper than those recommended or closer than 15 feet from an existing surface improvement should be shored in accordance with applicable OSHA codes and regulations.

7.4.2 The stability of the excavations is dependent on the design and construction of the shoring system and site conditions. Therefore, Geocon Incorporated cannot be responsible for site safety and the stability of the proposed excavations.

7.4.3 The design of temporary shoring is governed by soil and groundwater conditions, and by the depth and width of the excavated area. Continuous support of the excavation face can be provided by a system of soldier piles and wood lagging or sheet piles. Excavations exceeding 15 feet may require soil nails, tieback anchors or internal bracing to provide additional wall restraint.

7.4.4 The condition of existing buildings, streets, sidewalks, and other structures/improvements around the perimeter of the planned excavation should be documented prior to the start of shoring and excavation work. Special attention should be given to documenting existing cracks or other indications of differential settlement within these adjacent structures,

pavements and other improvements. Underground utilities sensitive to settlement should be videotaped prior to construction to check the integrity of pipes. In addition, monitoring points should be established indicating location and elevation around the excavation and upon existing buildings. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter.

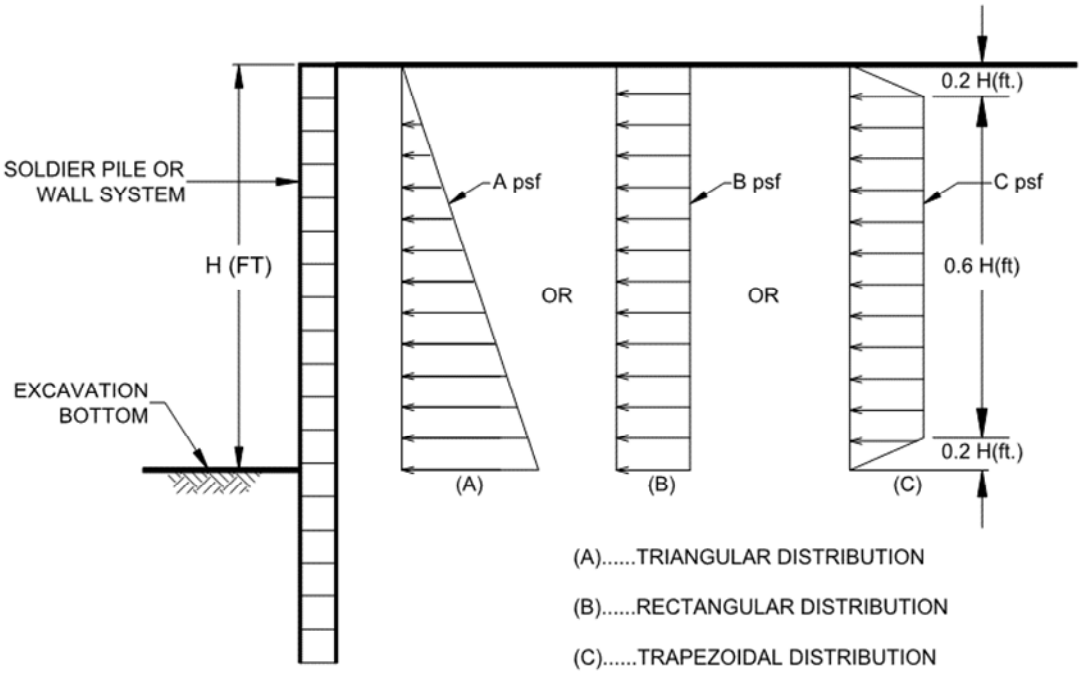
7.4.5 In general, ground conditions are moderately suited for soldier pile and tieback anchor wall construction techniques. However, gravel, cobble, and oversized material may be encountered in the existing materials that could be difficult to drill. Additionally, if cohesionless sands are encountered, some raveling may result along the unsupported portions of excavations.

7.4.6 Temporary shoring with a level backfill should be designed using a lateral pressure envelope acting on the back of the shoring as presented in Table 7.4.1 assuming a level backfill. The distributions are shown on the Active Pressures for Temporary Shoring. Triangular distribution should be used for cantilevered shoring and, the trapezoidal and rectangular distribution should be used for multi-braced systems such as tieback anchors and rakers. The project shoring engineer should determine the applicable soil distribution for the design of the temporary shoring system. Additional lateral earth pressure due to the surcharging effects from construction equipment, sloping backfill, planned stockpiles, adjacent structures and/or traffic loads should be considered, where appropriate, during design of the shoring system.

TABLE 7.4.1
SUMMARY OF TEMPORARY SHORING WALL RECOMMENDATIONS

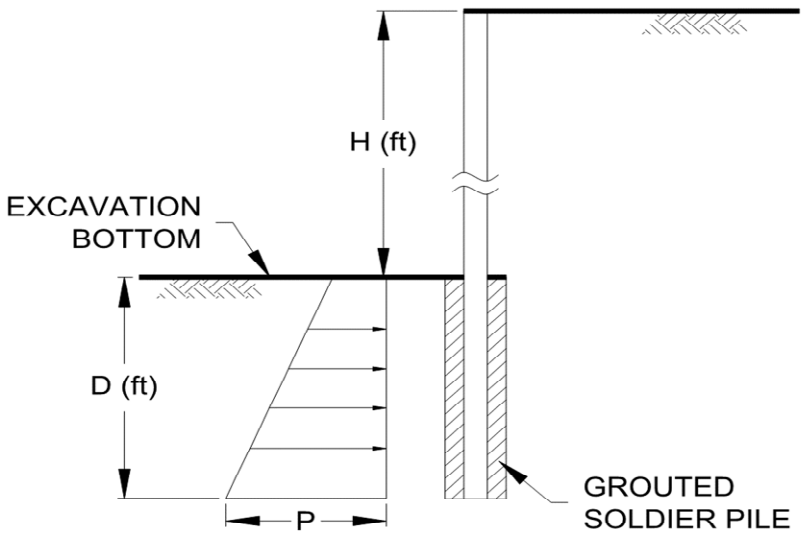
Parameter	Value
Triangular Distribution, A	27H psf
Rectangular Distribution, B	18H psf
Trapezoidal Distribution, C	22H psf
Passive Pressure, P	375D + 500 psf
Effective Zone Angle, E	30 degrees
Maximum Design Lateral Movement	1 Inch
Maximum Design Vertical Movement	½ Inch
Maximum Design Retained Height, H	35 Feet

H equals the height of the retaining portion of the wall in feet
D equals the embedment depth of the retaining wall in feet



Active Pressures on Temporary Shoring

7.4.7 The passive resistance can be assumed to act over a width of three pile diameters. Typically, soldier piles are embedded a minimum of 0.5 times the maximum height of the excavation (this depth is to include footing excavations) if tieback anchors are not employed. The project structural engineer should determine the actual embedment depth.



Passive Pressures on Temporary Shoring

7.4.8 We should observe the drilled shafts for the soldier piles prior to the placement of steel reinforcement to check that the exposed soil conditions are similar to those expected and that

footing excavations have been extended to the appropriate bearing strata and design depths. If unexpected soil conditions are encountered, foundation modifications may be required.

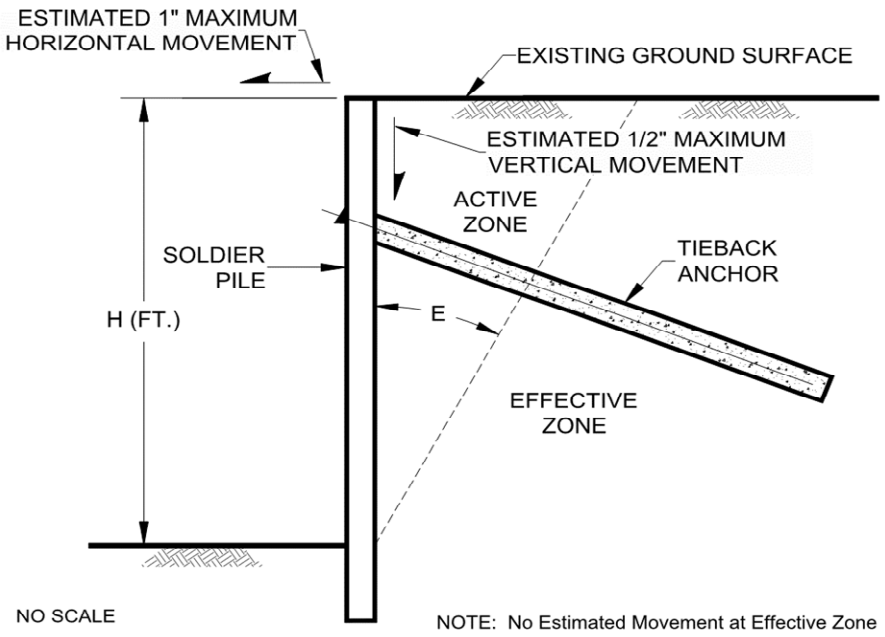
7.4.9 Lateral movement of shoring is associated with vertical ground settlement outside of the excavation. Therefore, it is essential that the soldier pile and tieback system allow very limited amounts of lateral displacement. Earth pressures acting on a lagging wall can cause movement of the shoring toward the excavation and result in ground subsidence outside of the excavation. Consequently, horizontal movements of the shoring wall should be accurately monitored and recorded during excavation and anchor construction.

7.4.10 The proposed excavations and shoring system should take into account the potential surcharge loads due to the existing retaining wall for Interstate 5/805. Additionally, the design team should determine if additional requirements or more stringent allowable deflections will need to be incorporated into the design of the shoring wall to accommodate the existing wall.

7.4.11 Survey points should be established at the top of the pile on at least 20 percent of the soldier piles. An additional point located at an intermediate point between the top of the pile and the base of the excavation should be monitored on at least 20 percent of the piles if tieback anchors will be used. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter until the permanent support system is constructed.

7.4.12 The project civil engineer should provide the approximate location, depth, and pipe type of the underground utilities to the shoring engineer to help select the shoring type and shoring design. The shoring system should be designed to limit horizontal soldier pile movement to a maximum of 1 inch. The amount of horizontal deflection can be assumed to be essentially zero along the Active Zone and Effective Zone boundary. The magnitude of movement for intermediate depths and distances from the shoring wall can be linearly interpolated.

7.4.13 Tieback anchors employed in shoring should be designed such that anchors fully penetrate the Active Zone behind the shoring. The Active Zone can be considered the wedge of soil from the face of the shoring to a plane extending upward from the base of the excavation as shown on the Active Zone Detail. Normally, tieback anchors are contractor-designed and installed, and there are numerous anchor construction methods available. Non-shrinkage grout should be used for the construction of the tieback anchors.



Active Zone Detail

7.4.14 Experience has shown that the use of pressure grouting during formation of the bonded portion of the anchor will increase the soil-grout bond stress. A pressure grouting tube should be installed during the construction of the tieback. Post grouting should be performed if adequate capacity cannot be obtained by other construction methods.

7.4.15 Anchor capacity is a function of construction method, depth of anchor, batter, diameter of the bonded section and the length of the bonded section. Anchor capacity should be evaluated using the strength parameters shown in Table 7.4.2.

TABLE 7.4.2
SOIL STRENGTH PARAMETERS FOR TEMPORARY SHORING

Description	Cohesion (psf)	Friction Angle (Degrees)
Undocumented Fill	100	28
Old Paralic Deposits	450	30

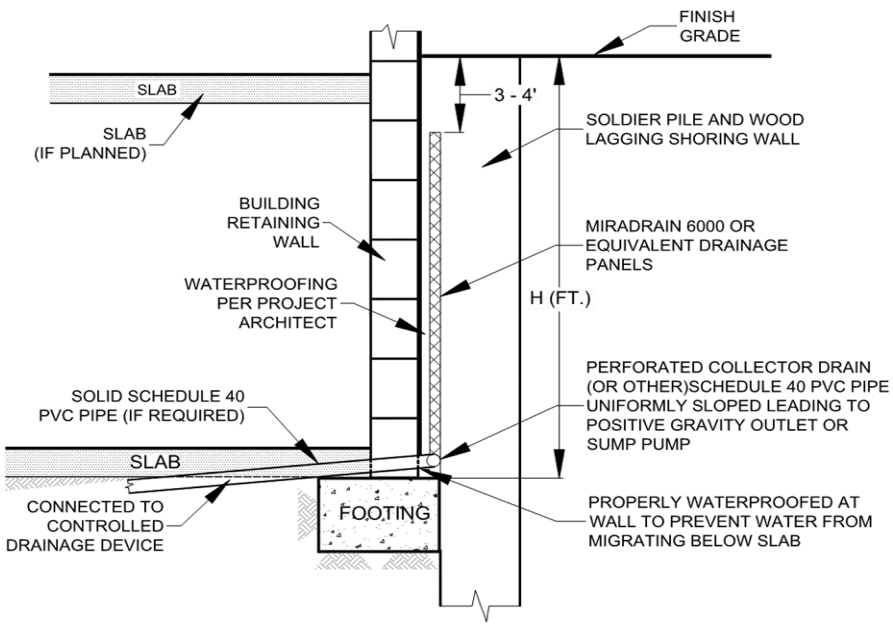
7.4.16 Grout should only be placed in the tieback anchor's bonded section prior to testing. Tieback anchors should be proof-tested to at least 130 percent of the anchor's design working load. Following a successful proof test, the tieback anchors should be locked off at 80 percent of the allowable working load. Tieback anchor test failure criteria should be established in project plans and specifications. The tieback anchor test failure criteria should be based upon a maximum allowable displacement at 130 percent of the anchor's working load

(anchor creep) and a maximum residual displacement within the anchor following stressing. Tieback anchor stressing should only be conducted after sufficient hydration has occurred within the grout. Tieback anchors that fail to meet project specified test criteria should be replaced or additional anchors should be constructed.

7.4.17 Lagging should keep pace with excavation. The excavation should not be advanced deeper than three feet below the bottom of lagging at any time. These unlagged gaps of up to three feet should only be allowed to stand for short periods of time in order to decrease the probability of soil instability and should never be unsupported overnight. Backfilling should be conducted when necessary between the back of lagging and excavation sidewalls to reduce sloughing in this zone and all voids should be filled by the end of each day. Further, the excavation should not be advanced further than four feet below a row of tiebacks prior to those tiebacks being proof tested and locked off unless otherwise specific by the shoring engineer. Surface sloughing may occur during the excavation process.

7.4.18 If tieback anchors are employed, an accurate survey of existing utilities and other underground structures adjacent to the shoring wall should be conducted. The survey should include both locations and depths of existing utilities. Locations of anchors should be adjusted as necessary during the design and construction process to accommodate the existing and proposed utilities.

7.4.19 The shoring system should incorporate a drainage system for the proposed retaining wall as shown herein.



Shoring Retaining Wall Drainage Detail

7.5 Seismic Design Criteria – 2019 California Building Code

7.5.1 Table 7.5.1 summarizes site-specific design criteria obtained from the 2019 California Building Code (CBC; Based on the 2018 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used the computer program *U.S. Seismic Design Maps*, provided by the Structural Engineers Association (SEA) to calculate the seismic design parameters. The short spectral response uses a period of 0.2 second. The Site Class should be evaluated during the geotechnical investigation; however, for this preliminary evaluation we expect the property will likely possess a Site Class of C. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2019 CBC and Table 20.3-1 of ASCE 7-16. The values presented herein are for the risk-targeted maximum considered earthquake (MCE_R). Sites designated as Site Class D, E and F may require additional analyses if requested by the project structural engineer and client.

TABLE 7.5.1
2019 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2019 CBC Reference
Site Class	C	Section 1613.2.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.161g	Figure 1613.2.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.411g	Figure 1613.2.1(2)
Site Coefficient, F_A	1.200	Table 1613.2.3(1)
Site Coefficient, F_V	1.500	Table 1613.2.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.393g	Section 1613.2.3 (Eqn 16-36)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	0.616g	Section 1613.2.3 (Eqn 16-37)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.929g	Section 1613.2.4 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.411g	Section 1613.2.4 (Eqn 16-39)

***Note:** Using the code-based values presented in this table, in lieu of a performing a ground motion hazard analysis, requires the exceptions outlined in ASCE 7-16 Section 11.4.8 be followed by the project structural engineer. Per Section 11.4.8 of ASCE/SEI 7-16, a ground motion hazard analysis should be performed for projects for Site Class "E" sites with Ss greater than or equal to 1.0g and for Site Class "D" and "E" sites with S1 greater than 0.2g. Section 11.4.8 also provides exceptions which indicates that the ground motion hazard analysis may be waived provided the exceptions are followed.

7.5.2 Table 7.5.2 presents the mapped maximum considered geometric mean (MCE_G) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

TABLE 7.5.2
ASCE 7-16 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-16 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.521g	Figure 22-7
Site Coefficient, F_{PGA}	1.200	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.625g	Section 11.8.3 (Eqn 11.8-1)

7.5.3 Conformance to the criteria in Tables 7.5.1 and 7.5.2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur in the event of a large earthquake. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

7.6 Shallow Foundations

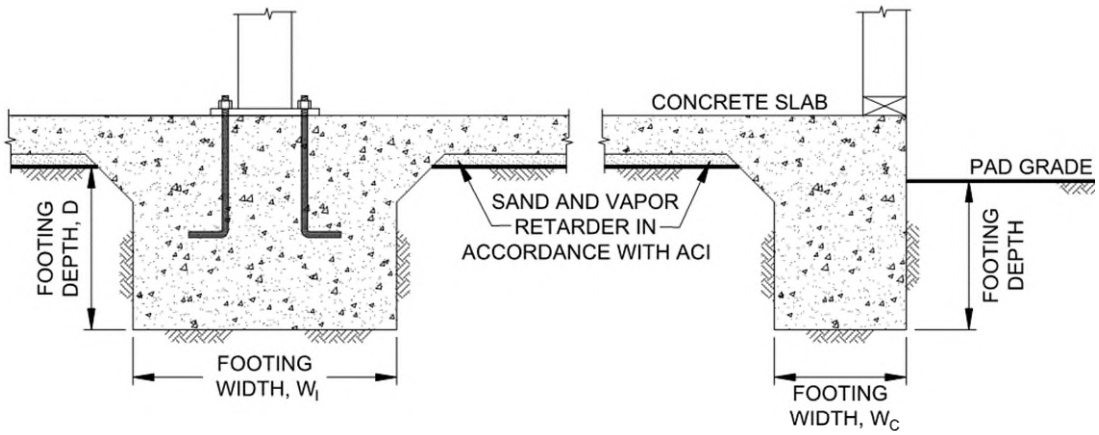
7.6.1 The proposed structure can be supported on a shallow foundation system founded in the formational materials. We understand that the foundations will be situated at least 10 feet below existing grades (1 to 2 levels subterranean). Foundations for the structure should consist of continuous strip footings and/or isolated spread footings. Table 7.6 provides a summary of the foundation design recommendations.

TABLE 7.6
SUMMARY OF FOUNDATION RECOMMENDATIONS

Parameter	Value
Minimum Continuous Foundation Width, W_C	18 inches
Minimum Isolated Foundation Width, W_I	24 inches
Minimum Foundation Depth, D	24 Inches Below Lowest Adjacent Grade
Minimum Steel Reinforcement	4 No. 5 Bars, 2 at the Top and 2 at the Bottom
Allowable Bearing Capacity*	7,000 psf
Bearing Capacity Increase	500 psf per Foot of Depth
	300 psf per Foot of Width
Maximum Allowable Bearing Capacity *	9,000 psf
Estimated Total Settlement	1 Inch
Estimated Differential Settlement	½ Inch in 40 Feet
Footing Size Used for Settlement	6-Foot Square
Design Expansion Index	90 or less

* Assuming foundations will be situated at a depth of at least 20 feet below grade.

7.6.2 The foundations should be embedded in accordance with the recommendations herein and the Wall/Column Footing Dimension Detail. The embedment depths should be measured from the lowest adjacent pad grade for both interior and exterior footings. Footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope (unless designed with a post-tensioned foundation system as discussed herein).



Wall/Column Footing Dimension Detail

7.6.3 The bearing capacity values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces.

7.6.4 Overexcavation of the footings and replacement with slurry can be performed in areas where formational materials are not encountered at the bottom of the footing. Minimum two-sack slurry can be placed in the excavations for the conventional foundations to the bottom of proposed footing elevation. We expect that this condition might be present on the western portion of the site and that the depth of the overexcavation may be on the order of 5 to 10 feet.

7.6.5 We should observe the foundation excavations prior to the placement of reinforcing steel and concrete to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.

7.6.6 Geocon Incorporated should be consulted to provide additional design parameters as required by the structural engineer.

7.7 Concrete Slabs-On-Grade

7.7.1 Concrete slabs-on-grade for the structures should be constructed in accordance with Table 7.7.

TABLE 7.7
MINIMUM CONCRETE SLAB-ON-GRADE RECOMMENDATIONS

Parameter	Value
Minimum Concrete Slab Thickness	5 inches
Minimum Steel Reinforcement	No. 4 Bars 18 Inches on Center, Both Directions
Typical Slab Underlayment	3 to 4 Inches of Sand/Gravel/Base
Design Expansion Index	90 or less

7.7.2 Slabs that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials should be underlain by a vapor retarder. The vapor retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). In addition, the membrane should be installed in accordance with manufacturer's recommendations and ASTM requirements and installed in a manner that prevents puncture. The vapor retarder used should be specified by the project architect or developer based on the type of floor covering that will be installed and if the structure will possess a humidity controlled environment.

7.7.3 The bedding sand thickness should be determined by the project foundation engineer, architect, and/or developer. It is common to have 3 to 4 inches of sand in the southern California region. However, we should be contacted to provide recommendations if the bedding sand is thicker than 6 inches. The foundation design engineer should provide appropriate concrete mix design criteria and curing measures to assure proper curing of the slab by reducing the potential for rapid moisture loss and subsequent cracking and/or slab curl. We suggest that the foundation design engineer present the concrete mix design and proper curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

7.7.4 Concrete slabs should be provided with adequate crack-control joints, construction joints and/or expansion joints to reduce unsightly shrinkage cracking. The design of joints should consider criteria of the American Concrete Institute (ACI) when establishing crack-control spacing. Crack-control joints should be spaced at intervals no greater than 12 feet. Additional steel reinforcing, concrete admixtures and/or closer crack control joint spacing should be considered where concrete-exposed finished floors are planned.

7.7.5 Special subgrade presaturation is not deemed necessary prior to placing concrete; however, the exposed foundation and slab subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.

7.7.6 The concrete slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting expected loads.

7.7.7 The recommendations of this report are intended to reduce the potential for cracking of slabs due to expansive soil (if present), differential settlement of existing soil or soil with varying thicknesses. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade placed on such conditions may still exhibit some cracking due to soil movement and/or shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

7.8 Exterior Concrete Flatwork

7.8.1 Exterior concrete flatwork not subject to vehicular traffic should be constructed in accordance with the recommendations presented in Table 7.8. The recommended steel reinforcement would help reduce the potential for cracking.

TABLE 7.8
MINIMUM CONCRETE FLATWORK RECOMMENDATIONS

Expansion Index, EI	Minimum Steel Reinforcement* Options	Minimum Thickness
EI $\leq$ 90	6x6-W2.9/W2.9 (6x6-6/6) welded wire mesh	4 Inches
	No. 3 Bars 18 inches on center, Both Directions	

*In excess of 8 feet square.

7.8.2 The subgrade soil should be properly moisturized and compacted prior to the placement of steel and concrete. The subgrade soil should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content in accordance with ASTM D 1557.

7.8.3 Even with the incorporation of the recommendations of this report, the exterior concrete flatwork has a potential to experience some uplift due to expansive soil beneath grade. The

steel reinforcement should overlap continuously in flatwork to reduce the potential for vertical offsets within flatwork. Additionally, flatwork should be structurally connected to the curbs, where possible, to reduce the potential for offsets between the curbs and the flatwork.

7.8.4 Concrete flatwork should be provided with crack control joints to reduce and/or control shrinkage cracking. Crack control spacing should be determined by the project structural engineer based upon the slab thickness and intended usage. Criteria of the American Concrete Institute (ACI) should be taken into consideration when establishing crack control spacing. Subgrade soil for exterior slabs not subjected to vehicle loads should be compacted in accordance with criteria presented in the grading section prior to concrete placement. Subgrade soil should be properly compacted and the moisture content of subgrade soil should be verified prior to placing concrete. Base materials will not be required below concrete improvements.

7.8.5 Where exterior flatwork abuts the structure at entrant or exit points, the exterior slab should be dowelled into the structure's foundation stemwall. This recommendation is intended to reduce the potential for differential elevations that could result from differential settlement or minor heave of the flatwork. Dowelling details should be designed by the project structural engineer.

7.8.6 The recommendations presented herein are intended to reduce the potential for cracking of exterior slabs as a result of differential movement. However, even with the incorporation of the recommendations presented herein, slabs-on-grade will still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, the use of crack control joints and proper concrete placement and curing. Crack control joints should be spaced at intervals no greater than 12 feet. Literature provided by the Portland Concrete Association (PCA) and American Concrete Institute (ACI) present recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

7.9 Retaining Walls

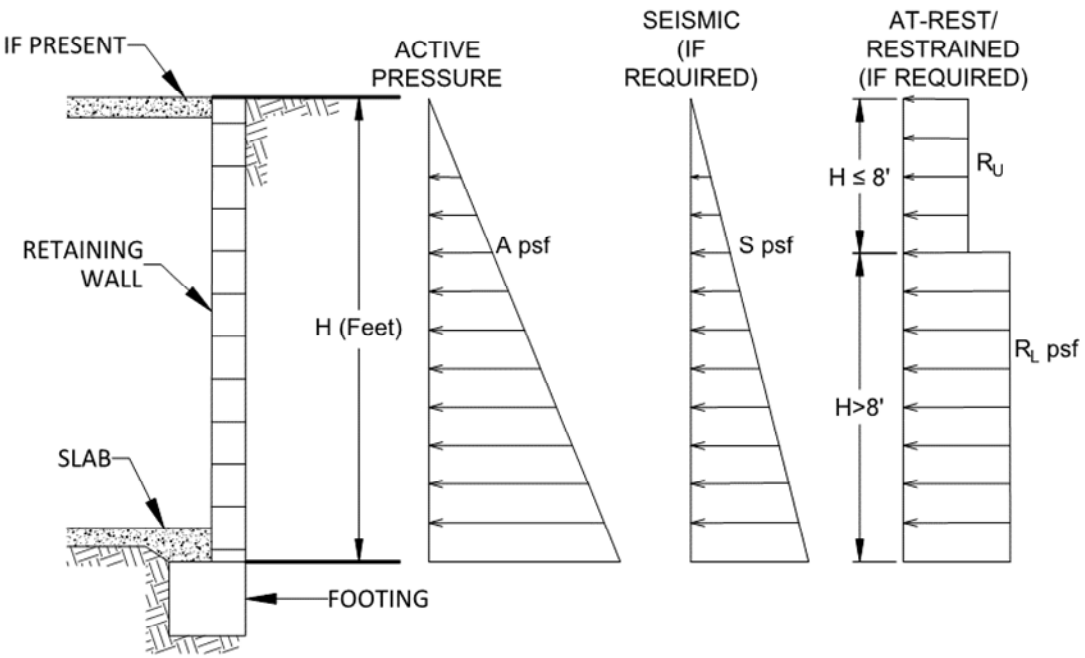
7.9.1 Retaining walls should be designed using the values presented in Table 7.9. Soil with an expansion index (EI) of greater than 90 should not be used as backfill material behind retaining walls.

TABLE 7.9
RETAINING WALL DESIGN RECOMMENDATIONS

Parameter	Value
Active Soil Pressure, A (Fluid Density, Level Backfill)	40 pcf
Active Soil Pressure, A (Fluid Density, 2:1 Sloping Backfill)	55 pcf
Seismic Pressure, S	15H psf
At-Rest/Restrained Walls Additional Uniform Pressure (0 to 8 Feet High)	7H psf
At-Rest/Restrained Walls Additional Uniform Pressure (8+ Feet High)	13H psf
Expected Expansion Index for the Subject Property	EI $\leq$ 90

H equals the height of the retaining portion of the wall

7.9.2 The project retaining walls should be designed as shown in the Retaining Wall Loading Diagram.



Retaining Wall Loading Diagram

7.9.3 It is common to see retaining walls constructed in the areas of the elevator pits. The retaining walls should be property drained and designed in accordance with the recommendations presented herein. If the elevator pit walls are not drained, the walls should be designed with an increased active pressure with an equivalent fluid density of 90 pcf. It is also common to see seepage and water collection within the elevator pit. The pit should be designed and properly waterproofed to prevent seepage and water migration into the elevator pit.

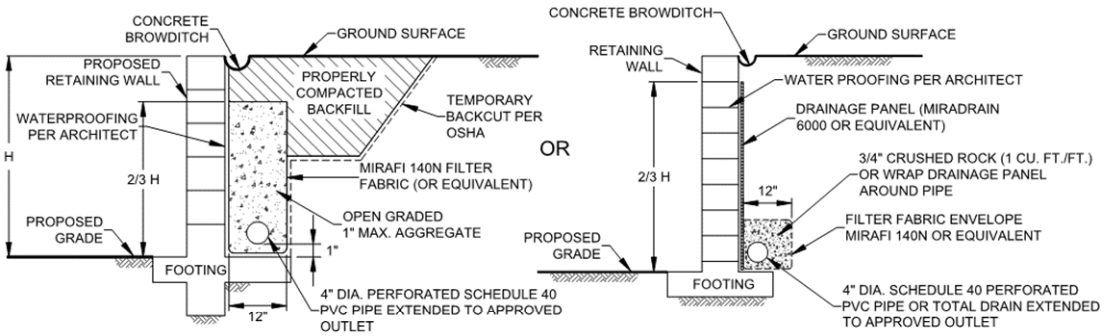
7.9.4 Unrestrained walls are those that are allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall) at the top of the wall. Where walls are restrained from movement at the top (at-rest condition), an additional uniform pressure should be applied to the wall.

7.9.5 Lateral earth pressure due to the surcharging effects from sloping backfill, adjacent structures and/or traffic loads should be considered, where appropriate, during design of the retaining wall. For retaining walls subject to vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent to 2 feet of fill soil should be added to the upper 10 feet of the wall.

7.9.6 The structural engineer should determine the Seismic Design Category for the project in accordance with Section 1613.3.5 of the 2019 CBC or Section 11.6 of ASCE 7-10. For structures assigned to Seismic Design Category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 1803.5.12 of the 2019 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall.

7.9.7 Retaining walls should be designed to ensure stability against overturning sliding, and excessive foundation pressure. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, it is not necessary to consider active pressure on the keyway.

7.9.8 Drainage openings through the base of the wall (weep holes) should not be used where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall. The recommendations herein assume a properly compacted granular (EI of 90 or less) free-draining backfill material with no hydrostatic forces or imposed surcharge load. The retaining wall should be properly drained as shown in the Typical Retaining Wall Drainage Detail. If conditions different than those described are expected, or if specific drainage details are desired, Geocon Incorporated should be contacted for additional recommendations.



Typical Retaining Wall Drainage Detail

7.9.9 The retaining walls may be designed using either the active and restrained (at-rest) loading condition or the active and seismic loading condition as suggested by the structural engineer. Typically, it appears the design of the restrained condition for retaining wall loading may be adequate for the seismic design of the retaining walls. However, the active earth pressure combined with the seismic design load should be reviewed and also considered in the design of the retaining walls.

7.9.10 The recommendations presented herein are generally applicable to the design of rigid concrete or masonry retaining walls. In the event that other types of walls (such as mechanically stabilized earth [MSE] walls, soil nail walls, or soldier pile walls) are planned, Geocon Incorporated should be consulted for additional recommendations.

7.9.11 Unrestrained walls will move laterally when backfilled and loading is applied. The amount of lateral deflection is dependent on the wall height, the type of soil used for backfill, and loads acting on the wall. The retaining walls and improvements above the retaining walls should be designed to incorporate an appropriate amount of lateral deflection as determined by the structural engineer.

7.9.12 Soil contemplated for use as retaining wall backfill, including import materials, should be identified in the field prior to backfill. At that time, Geocon Incorporated should obtain samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength. City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon Incorporated should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs will be used.

7.10 Lateral Loading

7.10.1 Table 7.10 should be used to help design the proposed structures and improvements to resist lateral loads for the design of footings or shear keys. The allowable passive pressure assumes a horizontal surface extending at least 5 feet, or three times the surface generating the passive pressure, whichever is greater. The upper 12 inches of material in areas not protected by floor slabs or pavement should not be included in design for passive resistance.

TABLE 7.10
SUMMARY OF LATERAL LOAD DESIGN RECOMMENDATIONS

Parameter	Value
Passive Pressure Fluid Density	350 pcf
Coefficient of Friction (Concrete and Soil)	0.35
Coefficient of Friction (Along Vapor Barrier)	0.2 to 0.25*

*Per manufacturer's recommendations.

7.10.2 The passive and frictional resistant loads can be combined for design purposes. The lateral passive pressures may be increased by one-third when considering transient loads due to wind or seismic forces.

7.11 Preliminary Pavement Recommendations

7.11.1 We calculated the flexible pavement sections in general conformance with the *Caltrans Method of Flexible Pavement Design* (Highway Design Manual, Section 608.4) using an estimated Traffic Index (TI) of 5.0, 5.5, 6.0 and 7.0 for parking stalls, driveways, medium truck traffic areas, and heavy truck traffic areas, respectively. The project civil engineer and owner should review the pavement designations to determine appropriate locations for pavement thickness. The final pavement sections for the parking lot should be based on the R-Value of the subgrade soil encountered at final subgrade elevation. We assumed an R-Value of 5 (based on laboratory testing) and 78 for the subgrade soil and base materials, respectively, for the purposes of this preliminary analysis. Table 7.11.1 presents the preliminary flexible pavement sections.

TABLE 7.11.1
PRELIMINARY FLEXIBLE PAVEMENT SECTION

Location	Assumed Traffic Index	Assumed Subgrade R-Value	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
Parking stalls for automobiles and light-duty vehicles	5.0	5	3	10
Driveways for automobiles and light-duty vehicles	5.5	5	3	12
Medium truck traffic areas	6.0	5	3½	13
Driveways for heavy truck traffic	7.0	5	4	16

7.11.2 Prior to placing base materials, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned as necessary, and recompacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM D 1557. Similarly, the base material should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Asphalt concrete should be compacted to a density of at least 95 percent of the laboratory Hveem density in accordance with ASTM D 2726.

7.11.3 A rigid Portland cement concrete (PCC) pavement section should be placed in roadway aprons and cross gutters. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330R-08 Guide for Design and Construction of Concrete Parking Lots using the parameters presented in Table 7.11.2.

TABLE 7.11.2
RIGID PAVEMENT DESIGN PARAMETERS

Design Parameter	Design Value
Modulus of subgrade reaction, k	50 pci
Modulus of rupture for concrete, M_R	500 psi
Concrete Compressive Strength	3,000 psi
Traffic Category, TC	A and C
Average daily truck traffic, ADTT	10 and 100

7.11.4 Based on the criteria presented herein, the PCC pavement sections should have a minimum thickness as presented in Table 7.11.3.

TABLE 7.11.3
RIGID VEHICULAR PAVEMENT RECOMMENDATIONS

Location	Portland Cement Concrete (inches)
Automobile Parking Stalls (TC=A, ADTT=10)	6.0
Driveways (Includes Fire Truck Loading) (TC=C, ADTT=100)	7.5

7.11.5 The PCC vehicular pavement should be placed over subgrade soil that is compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content.

7.11.6 The rigid pavement should also be designed and constructed incorporating the parameters presented in Table 7.11.4.

TABLE 7.11.4
ADDITIONAL RIGID PAVEMENT RECOMMENDATIONS

Subject	Value
Thickened Edge	1.2 Times Slab Thickness
	Minimum Increase of 2 Inches
	4 Feet Wide
Crack Control Joint Spacing	30 Times Slab Thickness
	Max. Spacing of 12 feet for 5.5-Inch-Thick
	Max. Spacing of 15 Feet for Slabs 6 Inches and Thicker
Crack Control Joint Depth	Per ACI 330R-08
	1 Inch Using Early-Entry Saws on Slabs Less Than 9 Inches Thick
Crack Control Joint Width	¼-Inch for Sealed Joints
	⅜-Inch is Common for Sealed Joints
	$^{1}/_{10}$- to $^{1}/_{8}$-Inch is Common for Unsealed Joints

7.11.7 Reinforcing steel will not be necessary within the concrete for geotechnical purposes with the possible exception of dowels at construction joints as discussed herein.

7.11.8 To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement slab. Crack-control joints should be sealed with an appropriate sealant to prevent the migration of water through the control joint to the subgrade materials. The depth of the crack-control joints should be determined by the referenced ACI report.

7.11.9 To provide load transfer between adjacent pavement slab sections, a butt-type construction joint should be constructed. The butt-type joint should be thickened by at least 20 percent at the edge and taper back at least 4 feet from the face of the slab. As an alternative to the butt-type construction joint, dowelling can be used between construction joints for pavements of 7 inches or thicker. As discussed in the referenced ACI guide, dowels should consist of smooth, 1-inch-diameter reinforcing steel 14 inches long embedded a minimum of 6 inches into the slab on either side of the construction joint. Dowels should be located at the midpoint of the slab, spaced at 12 inches on center and lubricated to allow joint movement while still transferring loads. In addition, tie bars should be installed as recommended in Section 3.8.3 of the referenced ACI guide. The structural engineer should provide other alternative recommendations for load transfer.

7.11.10 Concrete curb/gutter should be placed on soil subgrade compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Cross-gutters that receives vehicular should be placed on subgrade soil compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Base materials should not be placed below the curb/gutter, or cross-gutters so water is not able to migrate from the adjacent parkways to the pavement sections. Where flatwork is located directly adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to help reduce the potential for offsets between the curbs and the flatwork.

7.12 Site Drainage and Moisture Protection

7.12.1 Adequate site drainage is critical to reduce the potential for differential soil movement, erosion and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2019 CBC 1804.4 or other applicable standards. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.

7.12.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints, and a Miradrain drainage panel (or similar) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

7.12.3 Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks, and detected leaks should be repaired promptly. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

7.12.4 Landscaping planters adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. Area drains to collect excess irrigation water and transmit it to drainage structures or impervious above-grade planter boxes can be used. In addition, where landscaping is planned adjacent to the pavement, construction of a cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material should be considered.

7.12.5 We should prepare a storm water infiltration feasibility report of storm water management devices are planned.

7.13 Grading and Foundation Plan Review

7.13.1 Geocon Incorporated should review the grading and building foundation plans for the project prior to final design submittal to evaluate if additional analyses and/or recommendations are required.

7.14 Testing and Observation Services During Construction

7.14.1 Geocon Incorporated should provide geotechnical testing and observation services during the grading operations, foundation construction, utility installation, retaining wall backfill and pavement installation. Table 7.14 presents the typical geotechnical observations we would expect for the proposed improvements.

TABLE 7.14
EXPECTED GEOTECHNICAL TESTING AND OBSERVATION SERVICES

Construction Phase	Observations	Expected Time Frame
Grading	Base of Removal	Part Time During Removals
	Fill Placement and Soil Compaction	Full Time
Soldier Piles	Solder Pile Drilling Depth	Part Time
Tieback Anchors	Tieback Drilling and Installation	Full Time
	Tieback Testing	Full Time
Foundations	Foundation Excavation Observations	Part Time
Utility Backfill	Fill Placement and Soil Compaction	Part Time to Full Time
Retaining Wall Backfill	Fill Placement and Soil Compaction	Part Time to Full Time
Subgrade for Sidewalks, Curb/Gutter and Pavement	Soil Compaction	Part Time
Pavement Construction	Base Placement and Compaction	Part Time
	Asphalt Concrete Placement and Compaction	Full Time

LIMITATIONS AND UNIFORMITY OF CONDITIONS

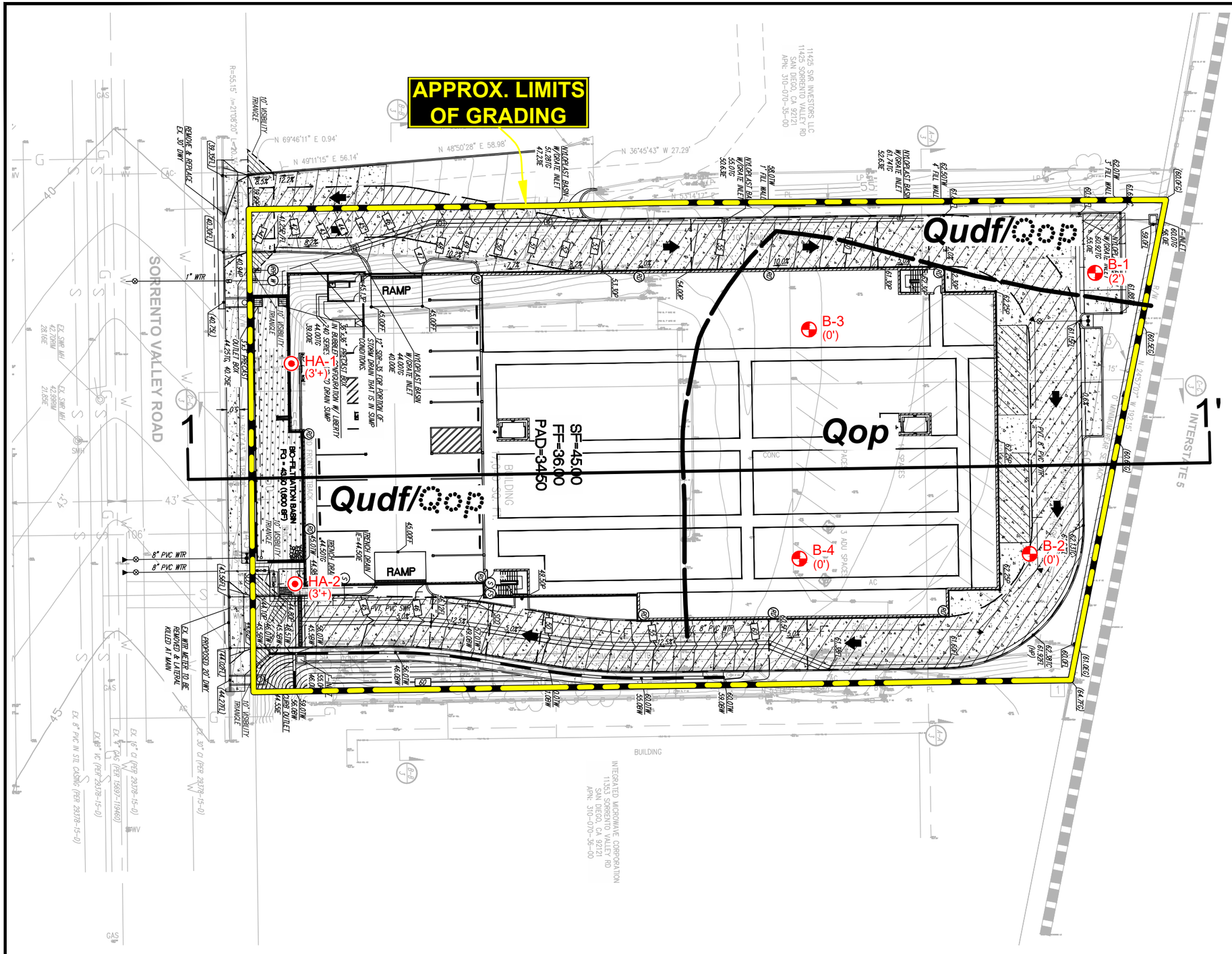
1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

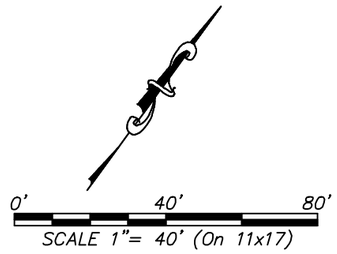
2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

U STOR IT - TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA





GEOCON LEGEND

- **Qudf** .....UNDOCUMENTED FILL
- **Qop** .....OLD PARALIC DEPOSITS (Dotted Where Buried)
- B-4 .....APPROX. LOCATION OF BORING
- HA-2 .....APPROX. LOCATION OF HAND AUGER BORING
- (2') .....APPROX. DEPTH TO FORMATION (In Feet)
- .....APPROX. LOCATION OF GEOLOGIC CONTACT
- 1 — 1' .....APPROX. LOCATION OF GEOLOGIC CROSS-SECTION

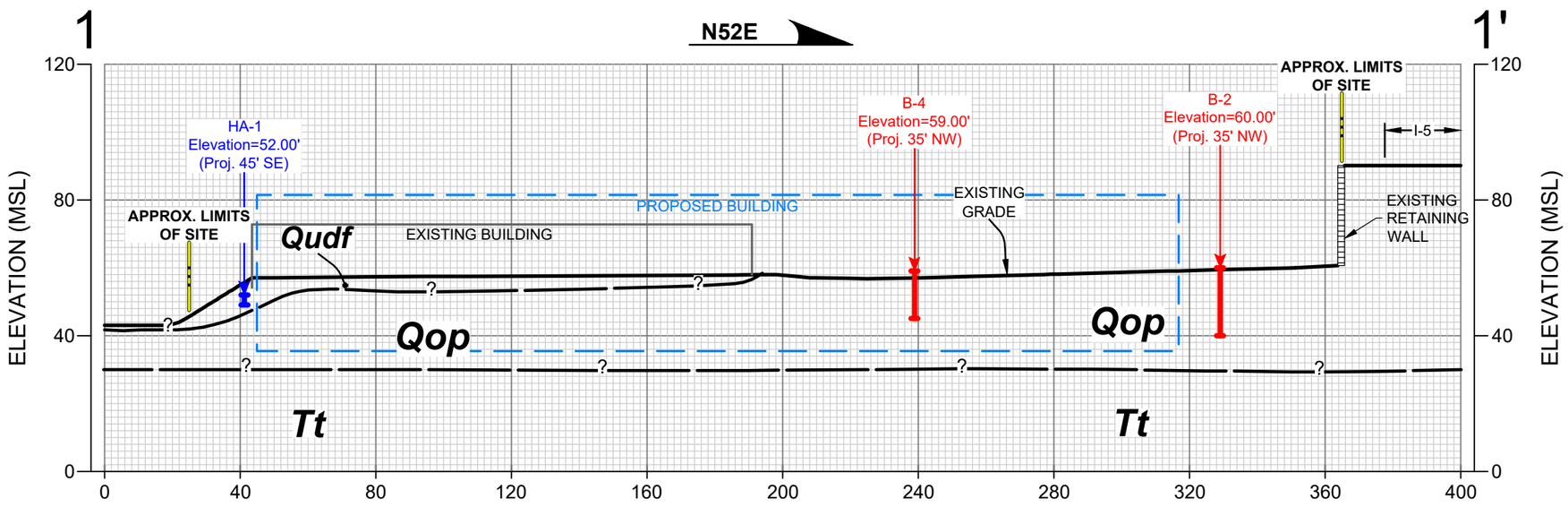
GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

PROJECT NO. G2740 - 52 - 01
FIGURE 1
DATE 03 - 08 - 2022

GEOLOGIC MAP

Plotted:03/08/2022 10:50AM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\G2740-52-01 U STOR IT\SHEETS\G2740-52-01 GeoMap.dwg

U STOR IT - TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA



GEOLOGIC CROSS-SECTION 1-1'

SCALE: 1" = 40' (Vert. = Horiz.)

GEOCON LEGEND

Qudf .....UNDOCUMENTED FILL

Qop .....OLD PARALIC DEPOSITS

Tt .....TORREY SANDSTONE

B-4 .....APPROX. LOCATION OF BORING

HA-1 .....APPROX. LOCATION OF HAND AUGER BORING

.....APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

PROJECT NO. G2740 - 52 - 01
FIGURE 2
DATE 03 - 08 - 2022

GEOLOGIC CROSS - SECTION

Plotted:03/08/2022 10:53AM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\G2740-52-01 U STOR IT\SOURCE\SECTION\G2740-52-01 Profile.dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

We performed the drilling operations on June 30, 2021 using a CME 75 drill rig equipped with hollow-stem augers or a hand auger with Baja Exploration. Borings extended to maximum depth of approximately 23 feet. The locations of the current exploratory borings are shown on the Geologic Map, Figure 1. The boring logs and are presented in this Appendix. We located the borings in the field using a measuring tape and existing reference points; therefore, actual boring locations may deviate slightly.

We obtained samples during our subsurface exploration in the borings using a California sampler. California samplers are composed of steel and are driven to obtain ring samples. The California sampler has an inside diameter of 2.5 inches and an outside diameter of 3 inches. Up to 18 rings are placed inside the sampler that is 2.4 inches in diameter and 1 inch in height. We obtained ring samples at appropriate intervals, placed them in moisture-tight containers, and transported them to the laboratory for testing. The type of sample is noted on the exploratory boring logs.

The samplers were driven 12 inches. The sampler is connected to A rods and driven into the bottom of the excavation using a 140-pound hammer with a 30-inch drop. Blow counts are recorded for every 6 inches the sampler is driven. The penetration resistances shown on the boring logs are shown in terms of blows per foot. The values indicated on the boring logs are the sum of the last 12 inches of the sampler. If the sampler was not driven for 12 inches, an approximate value is calculated in term of blows per foot or the final 6-inch interval is reported. These values are not to be taken as N-values as adjustments have not been applied. We estimated elevations shown on the boring logs either from a topographic map or by using a benchmark. Each excavation was backfilled as noted on the boring logs.

We visually examined, classified, and logged the soil encountered in the borings in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). The logs depict the soil and geologic conditions observed and the depth at which samples were obtained.

PROJECT NO. G2740-52-01

BORING B 1

ELEV. (MSL.) **60'** DATE COMPLETED **06-30-2021**

EQUIPMENT **CME 75** BY: **B. KUNA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	3" **ASPHALT CONCRETE** over **SUBGRADE SOIL**			
					UNDOCUMENTED FILL (Qudf) Medium dense, moist, brown, Silty, fine to medium SAND			
2	B1-1			CL/SC	**OLD PARALIC DEPOSITS (Qop)** Very stiff and dense, damp to moist, reddish to yellowish brown, Sandy CLAY and Clayey SAND	48	103.7	14.1
4								
6	B1-2				-Decrease in fines content	64	107.3	8.8
	B1-3							
8								
10	B1-4					62	115.7	12.7
12								
14								
16				SC	Very dense, damp, reddish brown, Clayey, fine to coarse SAND with abundant gravel	82		
18								
20					-Abundant gravel and small cobbles, sampling unsuccessful			
22					-Refusal on gravel at 23 feet			
					BORING TERMINATED AT 23 FEET No groundwater encountered			

Figure A-1,
Log of Boring B 1, Page 1 of 1

G2740-52-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2740-52-01

BORING B 2

ELEV. (MSL.) **60'** DATE COMPLETED **06-30-2021**

EQUIPMENT **CME 75** BY: **B. KUNA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					3" **ASPHALT CONCRETE** over **SUBGRADE SOIL**			
				CL	**OLD PARALIC DEPOSITS (Qop)** Very stiff, moist to wet, grayish brown, Silty CLAY; few white stringers			
2	B2-1					27	101.1	22.8
4				SM	Medium dense, moist, brown, Silty, fine SAND; some iron oxide staining			
6	B2-2					26	110.2	11.9
8								
10	B2-3					24	110.2	17.7
				CL	Very stiff, moist, grayish brown, Silty CLAY; little fine sand			
12								
				SP	Medium dense, damp, light grayish brown to light yellowish brown, fine SAND; little cohesion			
14								
16	B2-4					37		3.8
18								
					-Becomes very gravelly at 19 feet; practical refusal on gravel at 20 feet			
20					REFUSAL AT 20 FEET No groundwater encountered Backfilled with drill cuttings mixed with bentonite chips			

Figure A-2,
Log of Boring B 2, Page 1 of 1

G2740-52-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G2740-52-01

BORING B 3

ELEV. (MSL.) **57'** DATE COMPLETED **06-30-2021**

EQUIPMENT **CME 75** BY: **B. KUNA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					3" **ASPHALT CONCRETE** over **SUBGRADE SOIL**			
				SM	**OLD PARALIC DEPOSITS (Qop)**			
2	B3-1				Medium dense, moist, grayish brown, Silty, fine SAND; some iron oxide staining	24	113.4	12.6
4								
6	B3-2					20	113.3	15.5
8				SP	Medium dense, moist, light yellowish brown and light grayish brown, fine to medium SAND; little cohesion, some gravel at 11 feet			
10	B3-3					37	98.2	8.2
					-Some gravel at 11 feet			
12								
					-Becomes very gravelly at 13 feet			
14								
	B3-4				-Sampling unsuccessful; practical refusal on gravel at 16 feet	71		
16					REFUSAL AT 16 FEET No groundwater encountered Backfilled with drill cuttings mixed with bentonite chips			

Figure A-3,
Log of Boring B 3, Page 1 of 1

G2740-52-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2740-52-01

BORING B 4

ELEV. (MSL.) **59'** DATE COMPLETED **06-30-2021**

EQUIPMENT **CME 75** BY: **B. KUNA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
	B4-1			CL	3" **ASPHALT CONCRETE** over **SUBGRADE SOIL**			
					OLD PARALIC DEPOSITS (Qop) Medium dense to very stiff, moist to wet, grayish brown, Sandy CLAY; little iron oxide staining			
2	B4-2					30	104.6	20.0
4								
	B4-3					35	106.9	9.5
6								
8				SM	Medium dense, damp to moist, grayish brown, Silty, fine to medium SAND			
	B4-4					37	105.5	4.6
10								
12					-Becomes very gravelly at 13 feet; practical refusal on gravel at 13 feet			
14					REFUSAL AT 14 FEET No groundwater encountered Backfilled with drill cuttings mixed with bentonite chips			

Figure A-4,
Log of Boring B 4, Page 1 of 1

G2740-52-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2740-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING HA 1** ELEV. (MSL.) **52'** DATE COMPLETED **06-30-2021** EQUIPMENT **HAND AUGER** BY: **D. GITHENS**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	HA1-1			SC	**UNDOCUMENTED FILL (Qudf)** Loose to medium dense, damp, light brown to light yellowish brown, Silty to Clayey, fine SAND with trace gravel up to 1"			
2					BORING TERMINATED AT 3 FEET Refusal on cobble or concrete			

Figure A-5,
Log of Boring HA 1, Page 1 of 1

G2740-52-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G2740-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING HA 2** ELEV. (MSL.) **46'** DATE COMPLETED **06-30-2021** EQUIPMENT **HAND AUGER** BY: **D. GITHENS**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	HA2-1			SM	**UNDOCUMENTED FILL (Qudf)** Loose to medium dense, light brown to light yellowish brown, Silty, fine to coarse SAND with little gravel up to 2.5"			
2					-Becomes damp to moist			
4					BORING TERMINATED AT 4 FEET Refusal on rock or concrete Backfilled with spoils			

Figure A-6,
Log of Boring HA 2, Page 1 of 1

G2740-52-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

APPENDIX B

APPENDIX B

LABORATORY TESTING

We performed laboratory tests in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. We tested selected soil samples for in-place dry density/moisture content, maximum density/optimum moisture content, direct shear strength, expansion index, pH, resistivity, water-soluble sulfate, water-soluble chloride ion content, plasticity index, R-Value, unconfined compressive strength, and gradation characteristics. The results of our current laboratory tests are presented herein. The in-place dry density and moisture content of the samples tested are presented on the boring logs in Appendix A.

SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS ASTM D 1557

Sample No.	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
B1-3	Reddish to Yellowish Brown, Sandy CLAY (Qop)	126.1	10.6
B4-1	Grayish Brown, Clayey SAND (Qop)	127.2	10.9

SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS ASTM D 4829

Sample No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	2019 CBC Expansion Classification	ASTM Soil Expansion Classification
	Before Test	After Test				
B1-3	11.9	22.6	104.5	44	Expansive	Low
B4-1	11.6	24.0	105.3	71	Expansive	Medium

SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS CALIFORNIA TEST NO. 417

Sample No.	Depth (feet)	Geologic Unit	Water-Soluble Sulfate (%)	ACI 318 Sulfate Exposure
B1-3	6-8	Qop	0.009	S0
B4-1	0-5	Qop	0.005	S0

SUMMARY OF LABORATORY CHLORIDE TEST RESULTS
AASHTO T 291

Sample No.	Depth (Feet)	Geologic Unit	Chloride Ion Content (ppm)	Chloride Ion Content (%)
B1-3	6-8	Qop	82	0.008

SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (PH) AND RESISTIVITY TEST RESULTS
CALIFORNIA TEST NO. 643

Sample No.	Depth (Feet)	Geologic Unit	pH	Minimum Resistivity (ohm-centimeters)
B1-3	6-8	Qop	1200	7.97

SUMMARY OF LABORATORY RESISTANCE VALUE (R-VALUE) TEST RESULTS
ASTM D 2844

Sample No.	Depth (Feet)	Description (Geologic Unit)	R-Value
B4-1	0-5	Grayish brown, Sandy Clay (Qop)	5

SUMMARY OF LABORATORY UNCONFINED COMPRESSIVE STRENGTH TEST RESULTS
ASTM D 1558

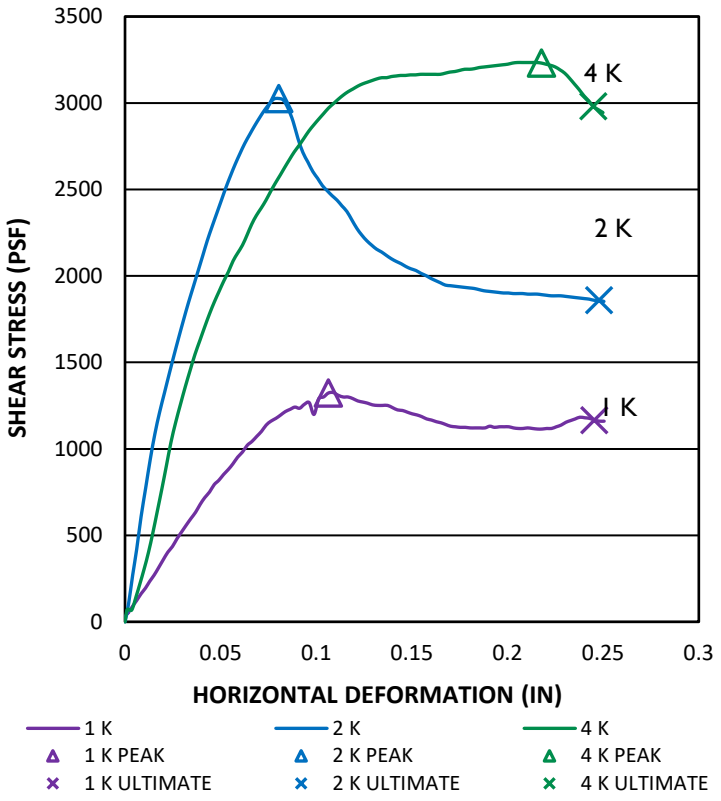
Sample No.	Depth (feet)	Geologic Unit	Hand Penetrometer Reading/Unconfined Compression Strength (tsf) and Undrained Shear Strength (ksf)
B1-1	2.5	Qop	4.5+
B1-4	10	Qop	4.5+
B2-1	2.5	Qop	4.5+
B2-2	5	Qop	4.5+
B2-3	10	Qop	4.5+
B3-1	2.5	Qop	4.5+
B3-2	5	Qop	4.5+
B4-2	2.5	Qop	4.5+

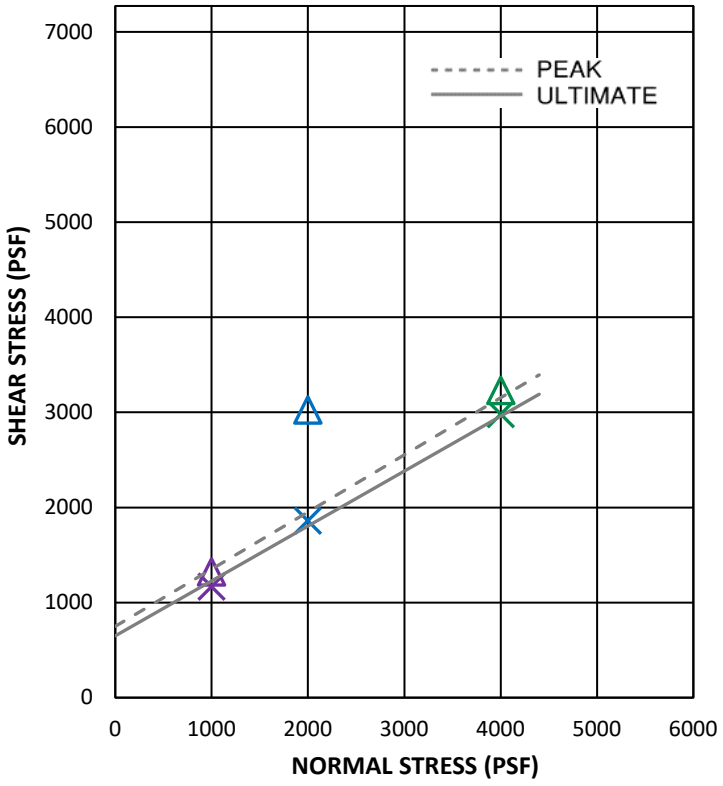
SAMPLE NO.:	**B1-2**	GEOLOGIC UNIT:	**Qop**
SAMPLE DEPTH (FT):	**5'**	NATURAL/REMOLDED:	**N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	**1 K**	**2 K**	**4 K**	**AVERAGE**
ACTUAL NORMAL STRESS (PSF):	1000	2000	4000	--
WATER CONTENT (%):	7.4	13.6	5.3	8.8
DRY DENSITY (PCF):	105.9	112.2	103.8	107.3

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	**1 K**	**2 K**	**4 K**	**AVERAGE**
WATER CONTENT (%):	19.5	19.5	21.2	20.1
PEAK SHEAR STRESS (PSF):	1323	3026	3231	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1167	1859	2981	--

RESULTS		
PEAK	COHESION, C (PSF)	750
	FRICTION ANGLE (DEGREES)	31
ULTIMATE	COHESION, C (PSF)	650
	FRICTION ANGLE (DEGREES)	30





GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

U STOR IT - TORREY PINES

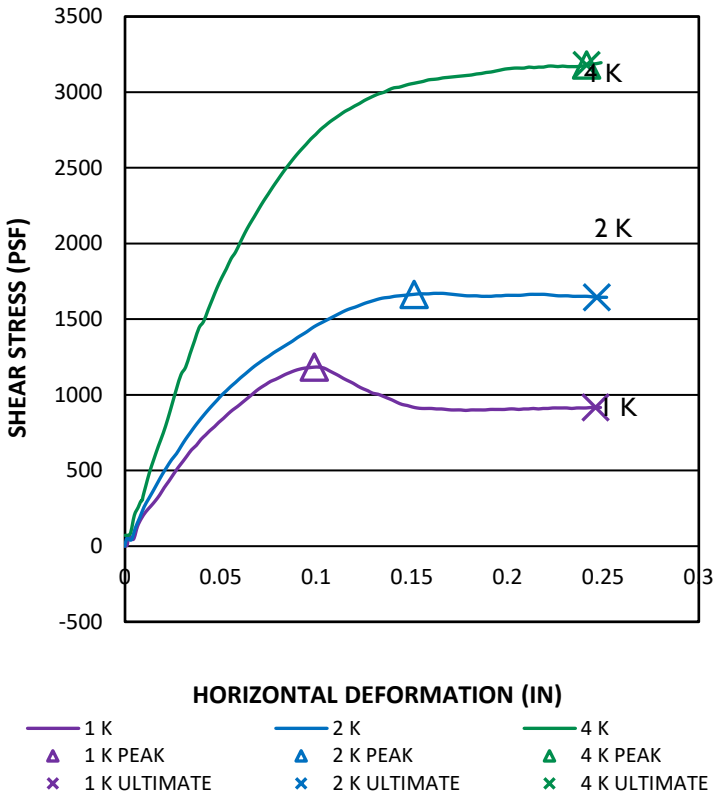
PROJECT NO.: G2740-52-01

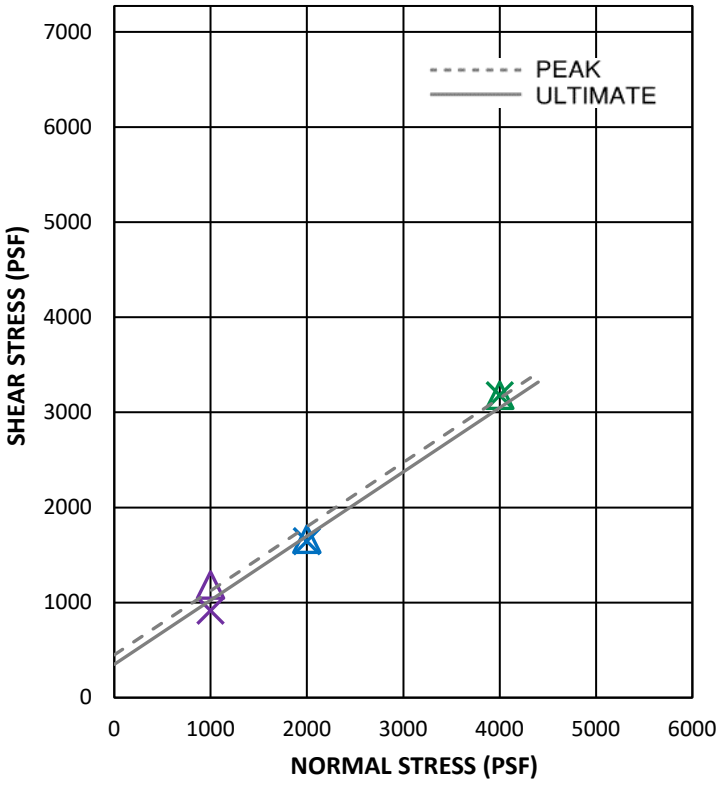
SAMPLE NO.:	**B4-3**	GEOLOGIC UNIT:	**Qop**
SAMPLE DEPTH (FT):	**5'**	NATURAL/REMOLDED:	**N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	**1 K**	**2 K**	**4 K**	**AVERAGE**
ACTUAL NORMAL STRESS (PSF):	1000	2000	4000	--
WATER CONTENT (%):	9.3	9.1	10.0	9.5
DRY DENSITY (PCF):	107.2	107.7	105.8	106.9

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	**1 K**	**2 K**	**4 K**	**AVERAGE**
WATER CONTENT (%):	19.8	20.4	21.1	20.4
PEAK SHEAR STRESS (PSF):	1183	1664	3179	--
ULT.-E.O.T. SHEAR STRESS (PSF):	917	1645	3179	--

RESULTS		
PEAK	COHESION, C (PSF)	450
	FRICTION ANGLE (DEGREES)	34
ULTIMATE	COHESION, C (PSF)	350
	FRICTION ANGLE (DEGREES)	34





GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

U STOR IT - TORREY PINES

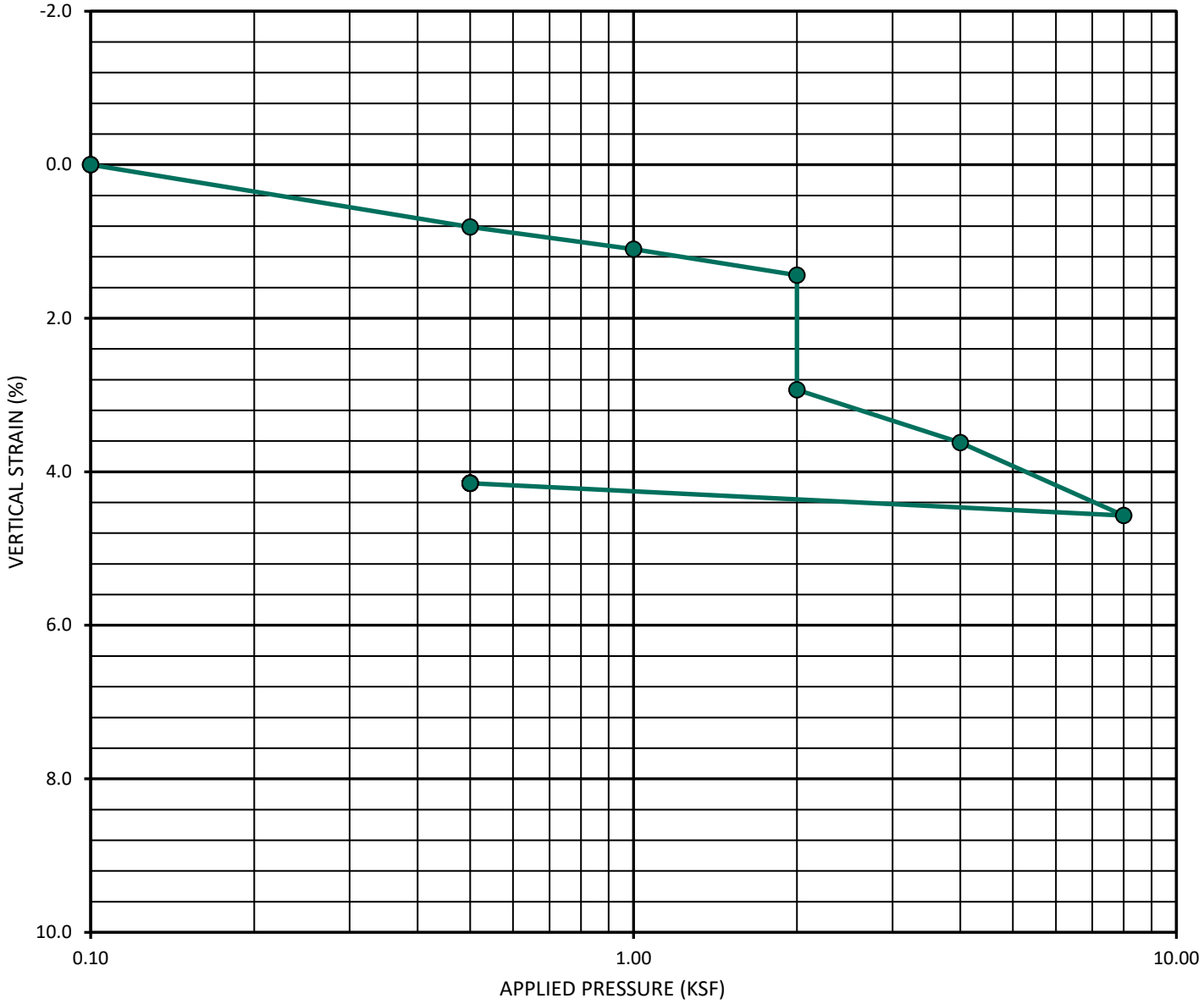
PROJECT NO.: G2740-52-01

SAMPLE NO.: **B4-4**

SAMPLE DEPTH (FT): **10'**

GEOLOGIC UNIT: **Qop**

TEST INFORMATION	
INITIAL DRY DENSITY (PCF):	105.5
INITIAL WATER CONTENT (%):	4.6%
SAMPLE SATURATED AT (KSF):	2.0
INITIAL SATURATION (%):	21.2%



CONSOLIDATION CURVE - ASTM D 2435

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

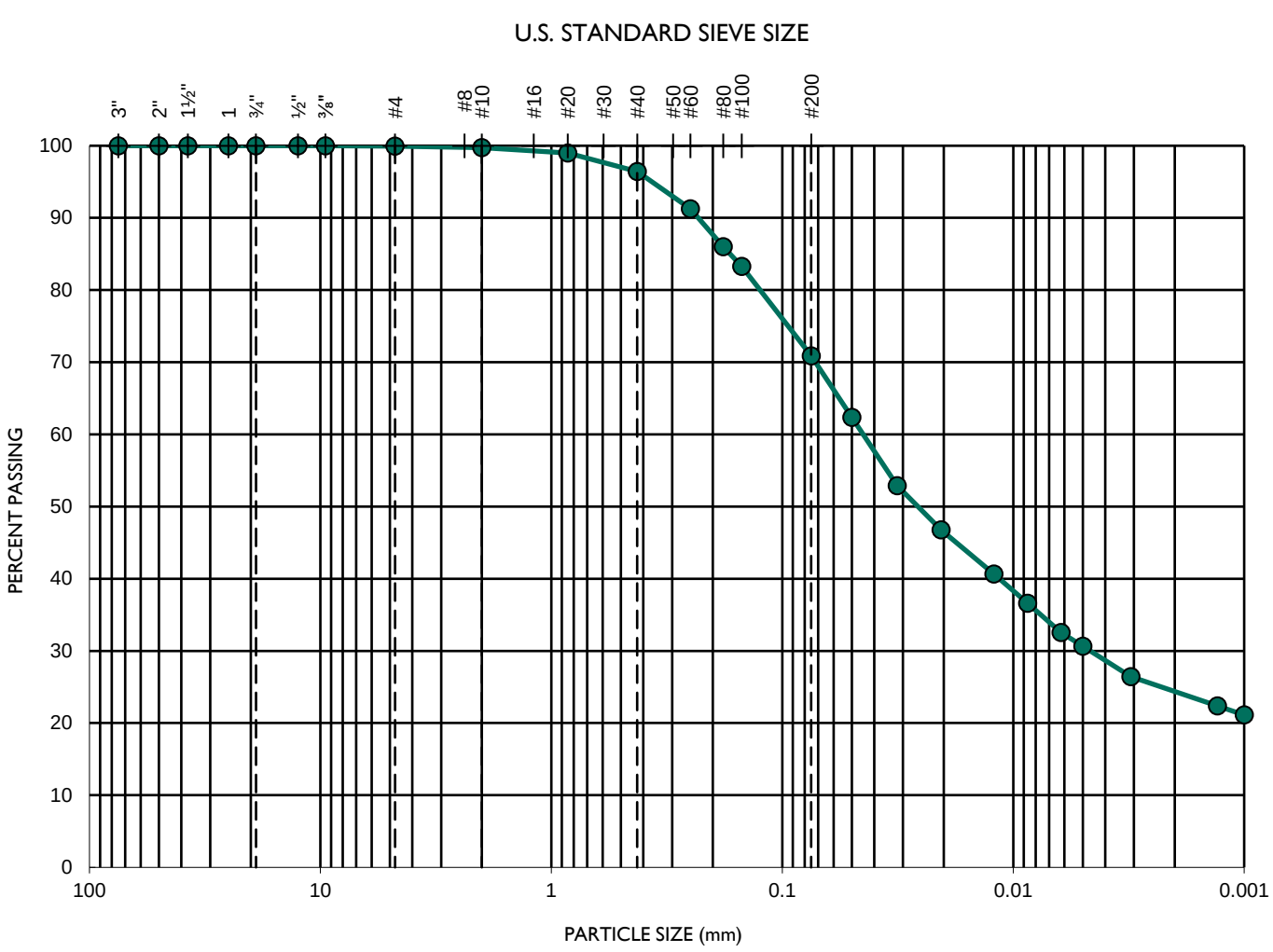
U STOR IT - TORREY PINES

PROJECT NO.: G2740-52-01

SAMPLE NO.: **B1-3** GEOLOGIC UNIT: **Qop**

SAMPLE DEPTH (FT.): **6'**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



TEST DATA					
D_{10} (mm)	D_{30} (mm)	D_{60} (mm)	C_c	C_u	SOIL DESCRIPTION
--	0.00471	0.04547	--	--	CLAY with sand

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

SIEVE ANALYSES - ASTM D 135 & D 422

U STOR IT - TORREY PINES

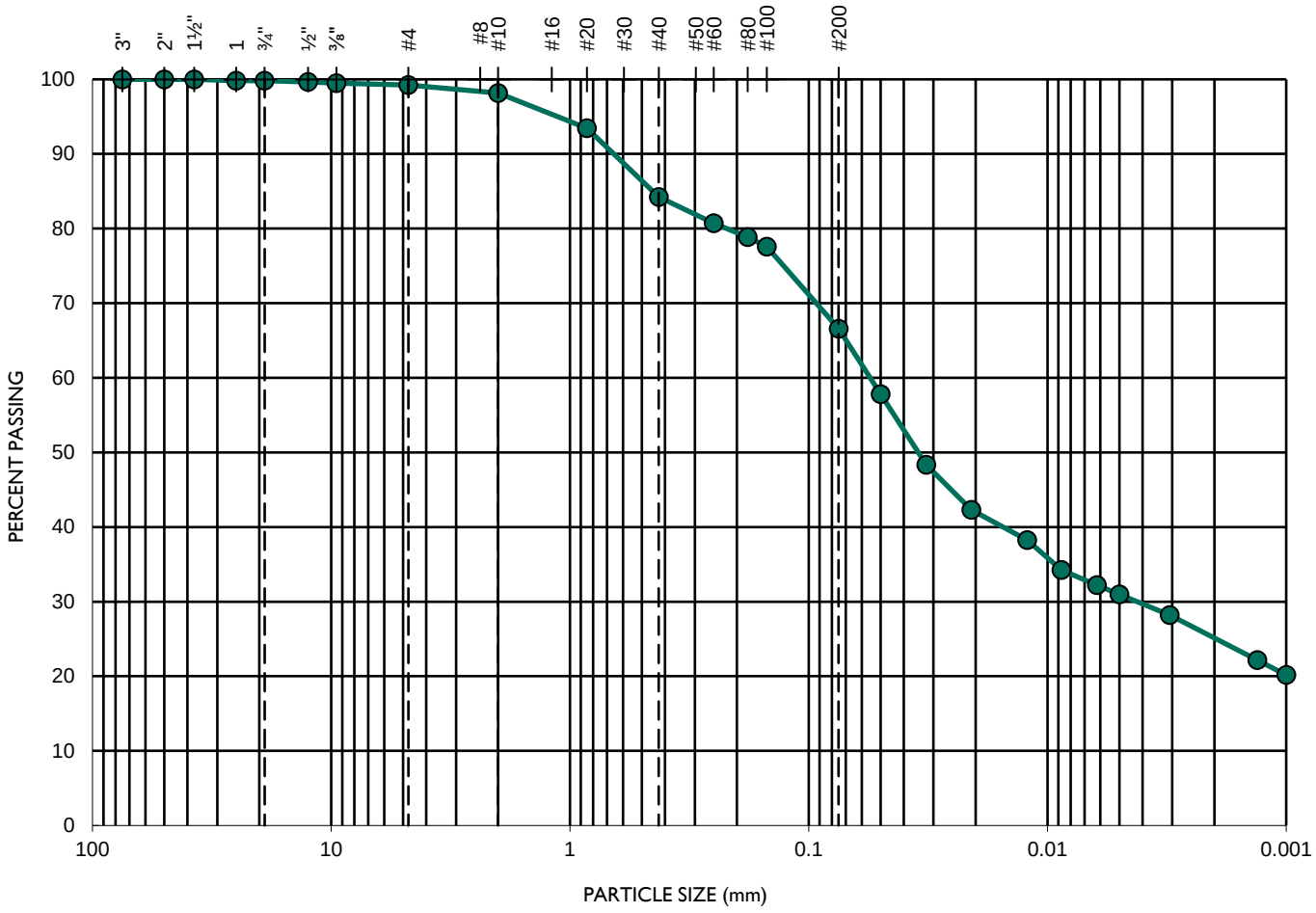
PROJECT NO.: G2740-52-01

SAMPLE NO.: **B4-1** GEOLOGIC UNIT: **Qop**

SAMPLE DEPTH (FT.): **1'**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE



TEST DATA					
D_{10} (mm)	D_{30} (mm)	D_{60} (mm)	C_c	C_u	SOIL DESCRIPTION
--	0.00432	0.05619	--	--	Sandy CLAY

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

SIEVE ANALYSES - ASTM D 135 & D 422

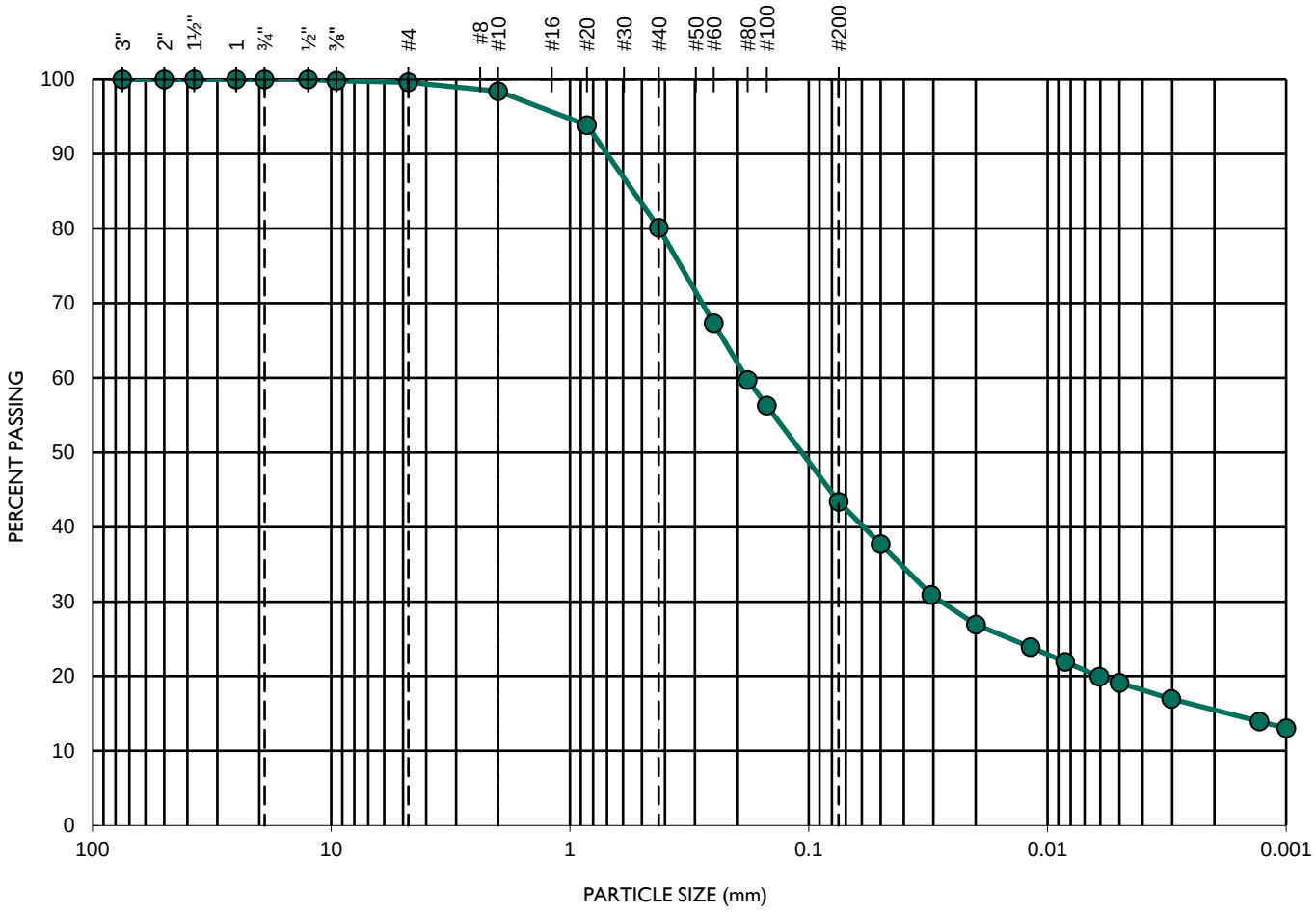
U STOR IT - TORREY PINES

PROJECT NO.: G2740-52-01

SAMPLE NO.: **HA1-1** GEOLOGIC UNIT: **Qudf**

SAMPLE DEPTH (FT.): **1'**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



TEST DATA					
D_{10} (mm)	D_{30} (mm)	D_{60} (mm)	C_c	C_u	SOIL DESCRIPTION
0.00002	0.02826	0.18252	281.3	11736.0	Silty Clayey SAND

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

SIEVE ANALYSES - ASTM D 135 & D 422

U STOR IT - TORREY PINES

PROJECT NO.: G2740-52-01

APPENDIX C

APPENDIX C

RECOMMENDED GRADING SPECIFICATIONS

FOR

U STOR IT
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA

PROJECT NO. G2740-52-01

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9

and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

4. CLEARING AND PREPARING AREAS TO BE FILLED

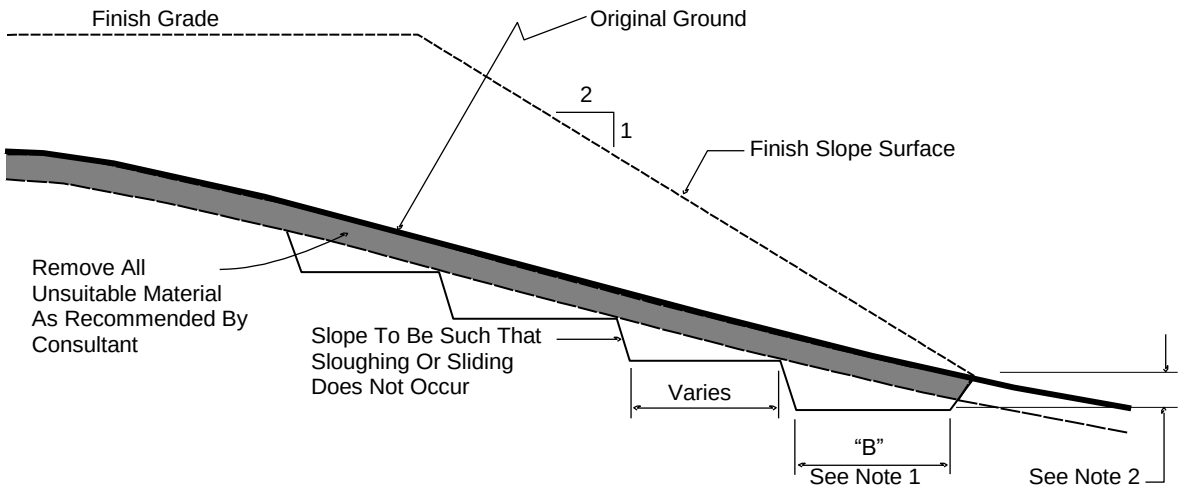
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



No Scale

DETAIL NOTES:

(1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection

variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of "passes" have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

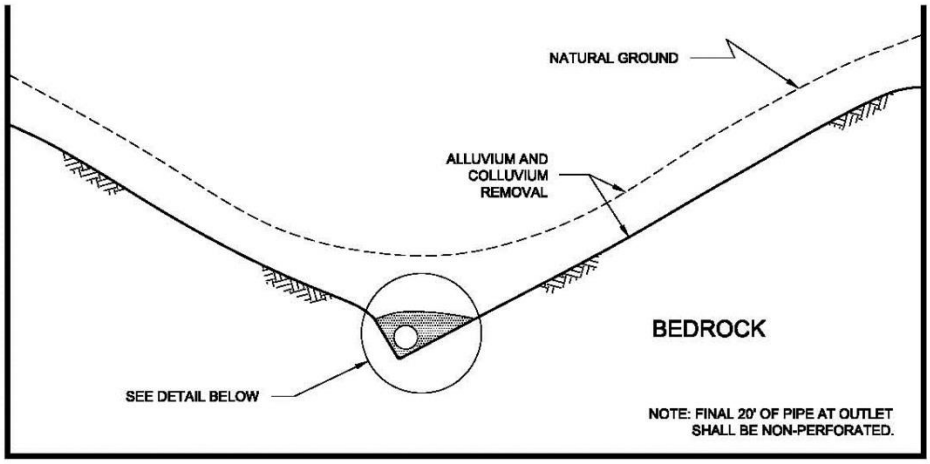
6.3.6 To reduce the potential for "piping" of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock* should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

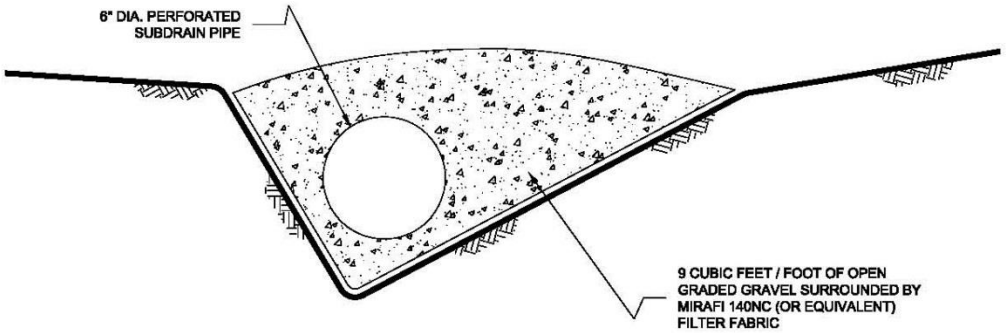
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL





NOTES:

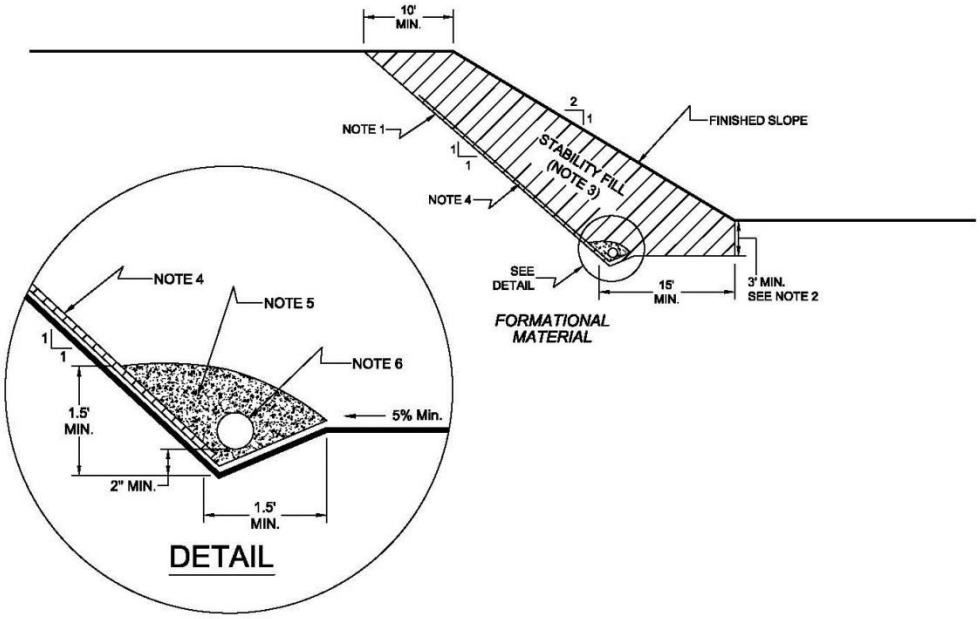
1.....6-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS
IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2.....6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS
LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL



NOTES:

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

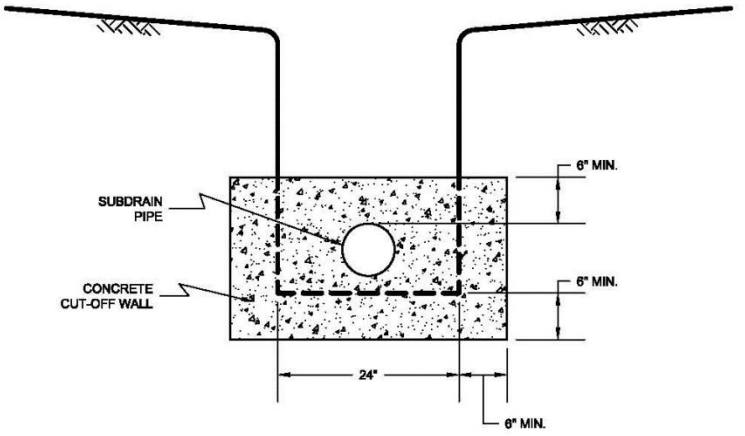
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

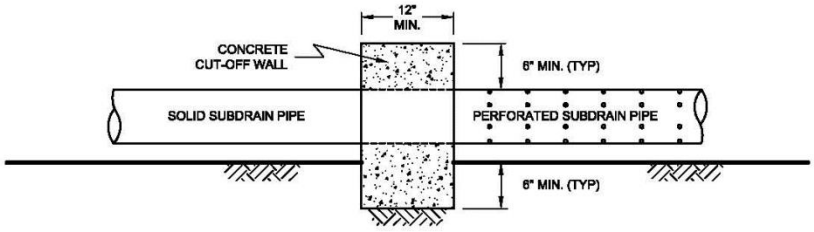
TYPICAL CUT OFF WALL DETAIL

FRONT VIEW



NO SCALE

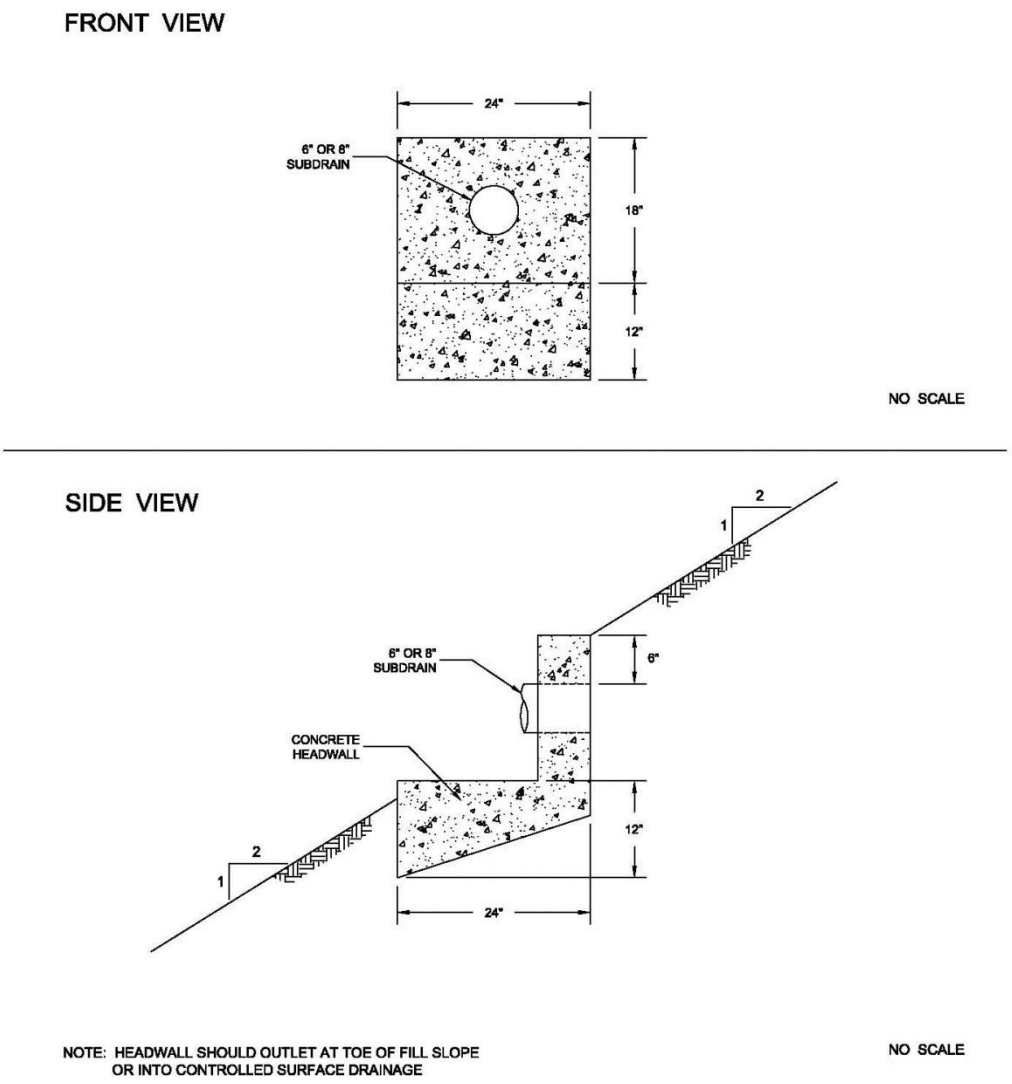
SIDE VIEW



NO SCALE

7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

TYPICAL HEADWALL DETAIL



7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an "as-built" map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

LIST OF REFERENCES

1. *2019 California Building Code, California Code of Regulations, Title 24, Part 2, based on the 2018 International Building Code*, prepared by California Building Standards Commission, dated July 2019.

2. *ACI 318-19, Commentary on Building Code Requirements for Structural Concrete,* prepared by the American Concrete Institute, dated May 2019.

3. American Concrete Institute, *ACI 330-08, Guide for the Design and Construction of Concrete Parking Lots*, dated June, 2008.

4. American Society of Civil Engineers (ASCE), *ASCE 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures*, 2017.

5. California Department of Conservation, Division of Mines and Geology, *Probabilistic Seismic Hazard Assessment for the State of California*, Open File Report 96-08, 1996.

6. California Geological Survey, *Seismic Shaking Hazards in California*, Based on the USGS/CGS Probabilistic Seismic Hazards Assessment (PSHA) Model, 2002 (revised April 2003). 10% probability of being exceeded in 50 years. *http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamain.html*

7. County of San Diego, *San Diego County Multi Jurisdiction Hazard Mitigation Plan, San Diego, California – Final Draft*, dated 2017.

8. Historical Aerial Photos. *http://www.historicaerials.com*

9. Jennings, C. W., 1994, California Division of Mines and Geology, *Fault Activity Map of California and Adjacent Areas,* California Geologic Data Map Series Map No. 6.

10. Kennedy, M. P., and S. S. Tan, 2008, *Geologic Map of the San Diego 30'x60' Quadrangle, California*, USGS Regional Map Series Map No. 3, Scale 1:100,000.

11. Special Publication 117A, *Guidelines For Evaluating and Mitigating Seismic Hazards in California 2008*, California Geological Survey, Revised and Re-adopted September 11, 2008.

12. Unpublished reports, aerial photographs, and maps on file with Geocon Incorporated.

13. USGS computer program, Seismic Hazard Curves and Uniform Hazard Response Spectra, *http://geohazards.usgs.gov/designmaps/us/application.php.*

STORM WATER MANAGEMENT INVESTIGATION

U STOR IT - TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

CHICAGO CAPITOL FUNDS, LLC
SAN DIEGO, CALIFORNIA

MARCH 8, 2022
PROJECT NO. G2740-52-01

Project No. G2740-52-01
March 8, 2022

Chicago Capital Funds, LLC
501 West Broadway STE 2020
San Diego, California 92101

Attention: Mr. Larry Nora

Subject: STORM WATER MANAGEMENT INVESTIGATION
U STOR IT - TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA

References:
1. *Geotechnical Investigation, U STOR IT Torrey Pines, 11391 Sorrento Valley Road, San Diego, California*, prepared by Geocon Incorporated, DRAFT dated July 30, 2021 (Project No. G2740-52-01).

2. *Torrey Pines U-STOR-IT Self Storage Facility Plans: 11391 Sorrento Valley Road, San Diego, California*, prepared by DDCA Architects, dated November 3, 2021 (Project No. 121152).

Dear Mr. Nora:

We prepared this letter to describe the existing geotechnical conditions for the purposes of storm water management for the subject property. We performed the referenced geotechnical investigation to evaluate the current geologic conditions on the property in accordance with the *City of San Diego Storm Water Standards* (SWS), dates October 1, 2018.

SITE AND PROJECT DESCRIPTION

The subject property is located at 11391 Sorrento Valley Road in the Sorrento Valley area of San Diego, California. The site is north and south of existing commercial buildings , west of Interstate 5 and east of Sorrento Valley Road. The site is occupied by a single-story commercial building with accommodating driveways, surface parking, utilities and landscaping. We expect the existing structure is supported on conventional shallow foundations with a concrete slab-on-grade. The property is relatively flat at an elevation of about 60 to 65 feet above Mean Sea Level (MSL) at the southwest and northeast ends of the site, respectively. A 10- to 15-foot fill slope exists on western portion of the site that descends to Sorrento Valley Road. A retaining wall (about 30 feet high) is present along the east side of the property that supports the adjacent Interstate 5 Bypass. The Existing Site Plan shows the current site configuration.

Existing Site Map

We understand the project will consist of demolishing the existing structure and improvements at the site and constructing a self-storage facility. Based on the referenced plans, we understand the proposed building will be 4 stories above grade situated over a subterranean level on the west end and 2 stories above grade over 3 subterranean levels on the east end. The site development will also include utilities, sidewalks and other associated improvements.

The locations, site descriptions, and proposed development are based on our site reconnaissance, review of published geologic literature, field investigations, and discussions with project personnel. If development plans differ from those described herein, Geocon Incorporated should be contacted for review of the plans and possible revisions to this report.

We prepared the referenced geotechnical investigation report for the site and proposed development. Our field investigation consisted of advancing 6 exploratory trenches and performing 2 infiltration tests. During our investigation, we encountered one surficial soil unit (consisting of undocumented fill) and one formational unit (consisting of Very Old Paralic Deposits). The occurrence, distribution, and description of each unit encountered are shown on the Geologic Map, Figure 1 and on the boring logs in Appendix A of the referenced report.

STORM WATER MANAGEMENT INVESTIGATION

We understand storm water management devices are being proposed in accordance with the *2021 City of San Diego Storm Water Standards* (SWS). If not properly constructed, there is a potential for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water to be detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff occurs, downstream properties may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

Hydrologic Soil Group

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, possesses general information regarding the existing soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. Table 1 presents the descriptions of the hydrologic soil groups. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. In addition, the USDA website also provides an estimated saturated hydraulic conductivity for the existing soil.

TABLE 1
HYDROLOGIC SOIL GROUP DEFINITIONS

Soil Group	Soil Group Definition
A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high-water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The site is underlain by undocumented fill and Old Paralic Deposits and should be classified as Soil Group D. Table 2 presents the information from the USDA website for the subject property. The Hydrologic Soil Group Map presents output from the USDA website showing the limits of the soil units.

TABLE 2
USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group	k_{SAT} of Most Limiting Layer (Inches/ Hour)
Corralitos Loamy Sand, 0 to 5 percent slopes	CsB	46	A	5.95-19.98
Huerhuero Loam, 15 to 30 percent slopes, eroded	HrE2	54	D	0.00-0.06

Hydrologic Soil Group Map

In-Situ Testing

We performed 2 infiltration tests using the Aardvark permeameter within the general area of potential storm water management basins. The results of the tests provide design parameters regarding the saturated hydraulic conductivity and infiltration characteristics of on-site soil and geologic units. Table 3 presents the results of the estimated field saturated hydraulic conductivity and estimated infiltration rates obtained from the infiltration tests. The field sheets are also attached herein. Based on the *City of San Diego Storm Water Standards*, the infiltration rate should be considered equal to the saturated hydraulic conductivity rate. We applied a feasibility factor of safety of 2.0 to our estimated infiltration rates to provide input on Worksheet C.4-1. Soil infiltration rates from in-situ tests can vary

significantly from one location to another due to the heterogeneous characteristics inherent to most soil. The Geologic Map, Figure 1, presents the locations of the permeability tests.

TABLE 3
FIELD PERMEAMETER INFILTRATION TEST RESULTS

Test No.	Geologic Unit	Test Depth (feet)	Field-Saturated Infiltration Rate, k_{sat} (inch/hour)	C.4-1 Worksheet Infiltration Rate[1], k_{sat} (inch/hour)
B-2	Qop	6	0.00	0.00
B-3	Qop	4	0.00	0.00
		Average:	0.00	0.00

[1] Using a factor of safety of 2.

Infiltration categories include full infiltration, partial infiltration and no infiltration. Table 4 presents the commonly accepted definitions of the potential infiltration categories based on the infiltration rates.

TABLE 4
INFILTRATION CATEGORIES

Infiltration Category	Field Infiltration Rate, I (inches/hour)	Factored Infiltration Rate*, I (inches/hour)
Full Infiltration	$I > 1.0$	$I > 0.5$
Partial Infiltration	$0.10 < I \leq 1.0$	$0.05 < I \leq 0.5$
No Infiltration (Infeasible)	$I < 0.10$	$I < 0.05$

*Using a Factor of Safety of 2.

GEOLOGIC HAZARDS AND CONSIDERATIONS

Groundwater Elevations

We did not encounter static groundwater during our field investigation to the maximum depth explored of 23 feet on the property. We expect static groundwater exits at depths greater than 30 feet below existing grades.

Soil or Groundwater Contamination

We are unaware of contaminated soil or groundwater contamination on the property. Therefore, infiltration associated with this risk is considered feasible.

New or Existing Utilities

Existing utilities are located in the streets and parking lot areas adjacent to the site and utilities will be constructed within the site boundaries. Full or partial infiltration should not be allowed in the areas of

the utilities to help prevent potential damage/distress to improvements. Mitigation measures to prevent water from infiltrating the utilities consist of setbacks, installing cutoff walls around the utilities and installing subdrains and/or installing liners. The horizontal and vertical setbacks for infiltration devices should be a minimum of 10 feet and a 1:1 plane of 1 foot below the closest edge of the deepest adjacent utility, respectively.

Existing and Planned Structures

Existing commercial structures are adjacent to the site and within the current site limits. Full or Partial infiltration should not be allowed in areas of the existing or proposed structures to help prevent potential damage/distress to improvements. Mitigation for existing structures consists of not allowing water infiltration within a lateral distance of at least 10 feet from the new or existing foundations and property lines.

Slopes and Other Geologic Hazards

The project site is relatively flat at elevations ranging from 45 to 60 feet mean sea level (MSL). A descending slope about 10 to 12 feet high exists on the western property line. The SWS recommends a minimum setback of 50 feet from sensitive slopes. Full or partial infiltration should be considered infeasible within this slope setback zone.

CONCLUSIONS AND RECOMMENDATIONS

Storm Water Evaluation Narrative

The area where infiltration could potentially be feasible is limited to the eastern portion of the property based on the locations of existing or proposed underground utilities, buildings and the descending slope. Therefore, we performed infiltration tests within the formational Old Paralic Deposits within eastern area where infiltration would be potentially feasible and away from the existing slopes on the western portion of the site.

Storm Water Infiltration Conclusion

Infiltration would not be possible in the areas of existing underground utilities, buildings, undocumented fill and descending slopes, as discussed herein. The infiltration test results from the area where infiltration could be possible within the Old Paralic Deposits indicate permeability rates less than 0.05 inches per hour (with a FOS of 2). Therefore, full or partial infiltration within the Old Paralic Deposits is considered infeasible at the site. The rates recorded can be applied to the geologic units across the property.

Storm Water Infiltration Recommendations

Liners and subdrains should be incorporated into the design and construction of the planned storm water devices. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of about 30 mil or equivalent Polyvinyl Chloride**,** PVC) to prevent water migration. The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

Storm Water Standard Worksheets

The SWS requests the geotechnical engineer complete the *Categorization of Infiltration Feasibility Condition* (Worksheet C.4-1 or Form I-8) worksheet information to help evaluate the potential for infiltration on the property. The attached Worksheet C.4-1 presents the completed information for the submittal process.

The regional storm water standards also have a worksheet (Worksheet D.5-1 or Form I-9) that helps the project civil engineer estimate the factor of safety based on several factors. Table 5 describes the suitability assessment input parameters related to the geotechnical engineering aspects for the factor of safety determination.

TABLE 5
SUITABILITY ASSESSMENT RELATED CONSIDERATIONS FOR INFILTRATION FACILITY SAFETY FACTORS

Consideration	High Concern – 3 Points	Medium Concern – 2 Points	Low Concern – 1 Point
Assessment Methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates. Use of well permeameter or borehole methods without accompanying continuous boring log. Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log. Direct measurement of infiltration area with localized infiltration measurement methods (e.g., Infiltrometer). Moderate spatial resolution	Direct measurement with localized (i.e. small-scale) infiltration testing methods at relatively high resolution or use of extensive test pit infiltration measurement methods.
Predominant Soil Texture	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site Soil Variability	Highly variable soils indicated from site assessment or unknown variability	Soil boring/test pits indicate moderately homogenous soils	Soil boring/test pits indicate relatively homogenous soils
Depth to Groundwater/ Impervious Layer	<5 feet below facility bottom	5-15 feet below facility bottom	>15 feet below facility bottom

Based on our geotechnical investigation and the previous table, Table 6 presents the estimated factor values for the evaluation of the factor of safety. This table only presents the suitability assessment safety factor (Part A) of the worksheet. The project civil engineer should evaluate the safety factor for design (Part B) and use the combined safety factor for the design infiltration rate.

TABLE 6
FACTOR OF SAFETY WORKSHEET DESIGN VALUES – PART A1

Suitability Assessment Factor Category	Assigned Weight (w)	Factor Value (v)	Product (p = w x v)
Assessment Methods	0.25	2	0.50
Predominant Soil Texture	0.25	2	0.50
Site Soil Variability	0.25	2	0.50
Depth to Groundwater/ Impervious Layer	0.25	1	0.25
Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.75

[1.] The project civil engineer should complete Worksheet D.5-1 or Form I-9 using the data on this table. Additional information is required to evaluate the design factor of safety.

If you have any questions regarding this correspondence, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

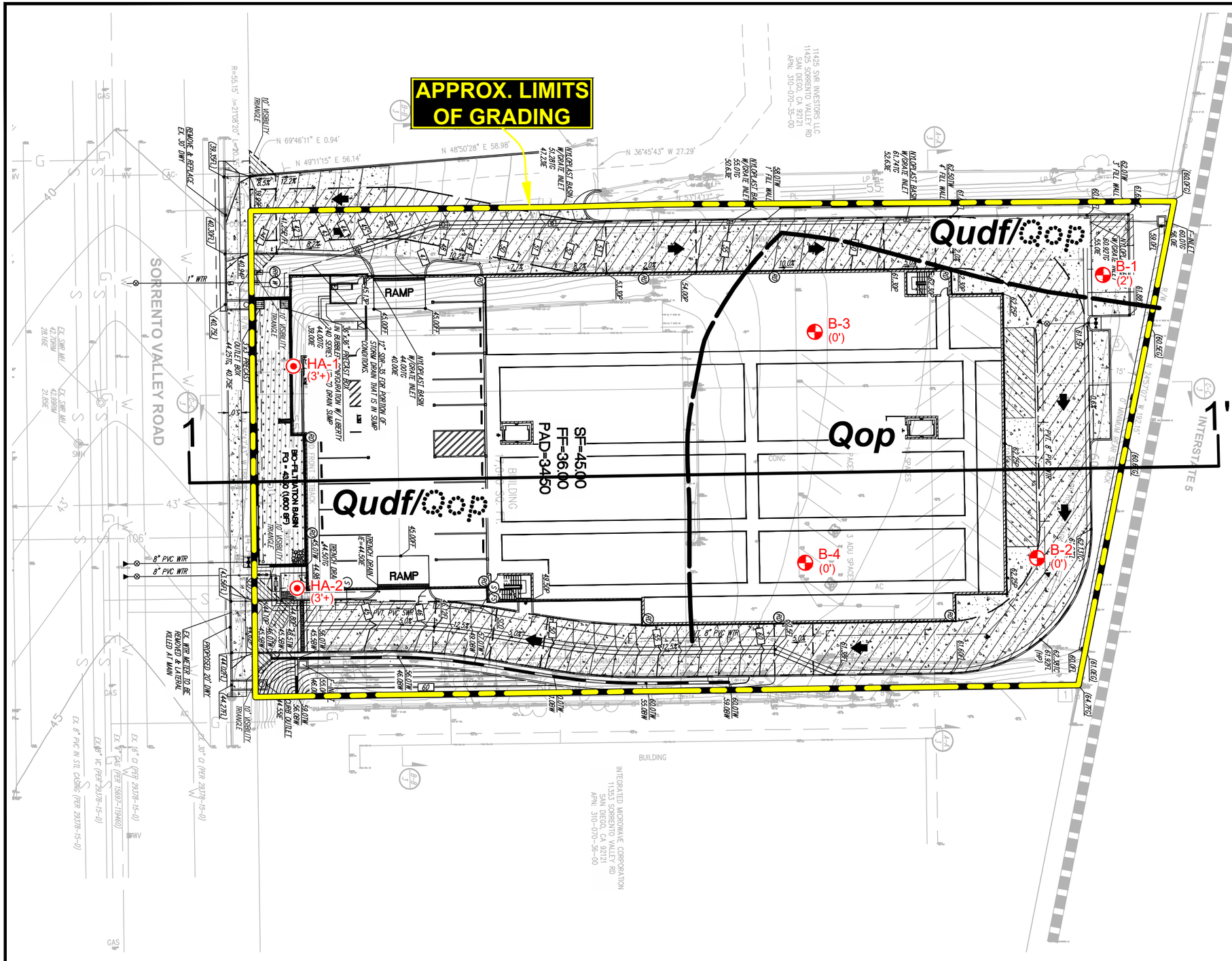
Matt R. Love
RCE 84154

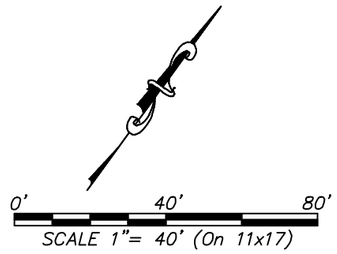
Shawn Foy Weedon
GE 2714

MRL:SFW:arm

(e-mail) Addressee

U STOR IT - TORREY PINES
11391 SORRENTO VALLEY ROAD
SAN DIEGO, CALIFORNIA





GEOCON LEGEND

- **Qudf** .....UNDOCUMENTED FILL
- **Qop** .....OLD PARALIC DEPOSITS (Dotted Where Buried)
- B-4 .....APPROX. LOCATION OF BORING
- HA-2 .....APPROX. LOCATION OF HAND AUGER BORING
- (2') .....APPROX. DEPTH TO FORMATION (In Feet)
- .....APPROX. LOCATION OF GEOLOGIC CONTACT
- 1 — 1' .....APPROX. LOCATION OF GEOLOGIC CROSS-SECTION

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

PROJECT NO. G2740 - 52 - 01
FIGURE 1
DATE ##

GEOLOGIC MAP

Plotted:03/03/2022 8:42AM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\G2740-52-01 U STOR IT\SHEETS\G2740-52-01 GeoMap.dwg

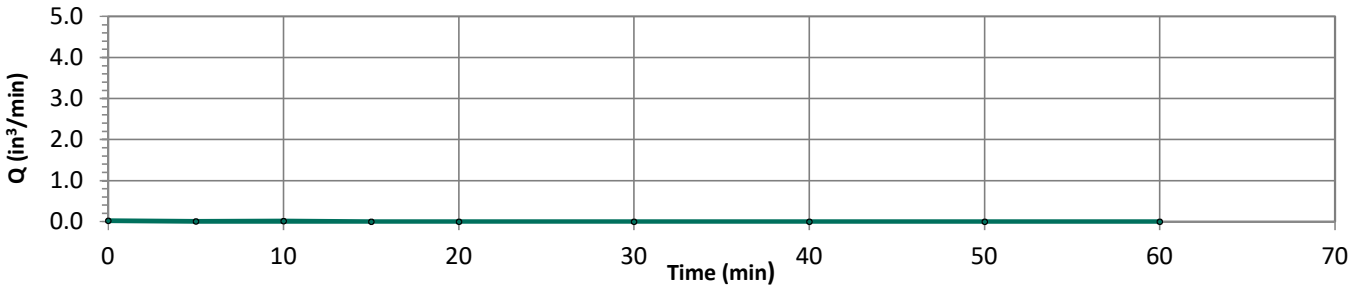
TEST NO.: **B-2**

GEOLOGIC UNIT: **Qop**

EXCAVATION ELEVATION (MSL, FT): **54**

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	6
BOREHOLE DEPTH (FT):	6.0
TEST/BOTTOM ELEVATION (MSL, FT):	48
MEASURED HEAD HEIGHT (IN):	6.0
CALCULATED HEAD HEIGHT (IN):	7.5
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN^3/MIN):	**0.000**
FIELD-SATURATED INFILTRATION RATE (IN/HR):	**0.000**
FACTORED INFILTRATION RATE (IN/HR):	**0.000**



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	0.004	0.11	0.022
3	5.00	0.001	0.03	0.006
4	5.00	0.002	0.06	0.011
5	5.00	0.000	0.00	0.000
6	10.00	0.000	0.00	0.000
7	10.00	0.000	0.00	0.000
8	10.00	0.000	0.00	0.000
9	10.00	0.000	0.00	0.000

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

AARDVARK PERMEAMETER TEST RESULTS

U STOR IT TORREY PINES

PROJECT NO.: G2740-52-01

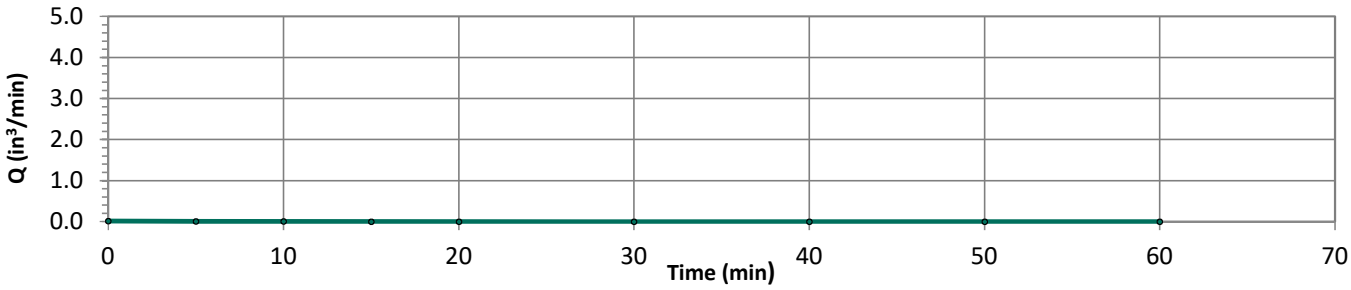
TEST NO.: **B-3**

GEOLOGIC UNIT: **Qop**

EXCAVATION ELEVATION (MSL, FT): **53**

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	6
BOREHOLE DEPTH (FT):	4.0
TEST/BOTTOM ELEVATION (MSL, FT):	49
MEASURED HEAD HEIGHT (IN):	6.0
CALCULATED HEAD HEIGHT (IN):	7.1
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN^3/MIN):	**0.000**
FIELD-SATURATED INFILTRATION RATE (IN/HR):	**0.000**
FACTORED INFILTRATION RATE (IN/HR):	**0.000**



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	0.002	0.06	0.011
3	5.00	0.001	0.03	0.006
4	5.00	0.001	0.03	0.006
5	5.00	0.000	0.00	0.000
6	10.00	0.000	0.00	0.000
7	10.00	0.000	0.00	0.000
8	10.00	0.000	0.00	0.000
9	10.00	0.000	0.00	0.000

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

AARDVARK PERMEAMETER TEST RESULTS

U STOR IT TORREY PINES

PROJECT NO.: G2740-52-01

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
Part 1 - Full Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
U STOR IT Torrey Pines	Design
Criteria 1: Infiltration Rate Screening	
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[11]? ☐ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ☒ No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ☐ No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ☐ No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ☒ Yes; Continue to Step 1C. ☐ No; Skip to Step 1D.
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ☐ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ☒ No; full infiltration is not required. Answer "No" to Criteria 1 Result.
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ☐ Yes; continue to Step 1E. ☐ No; select an appropriate infiltration testing method.

Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[10] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[11] Available data include site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☐ Yes; continue to Step 1F. ☐ No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☐ Yes; continue to Step 1G. ☐ No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐ Yes; answer "Yes" to Criteria 1 Result. ☐ No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☒ No; full infiltration is not required. Skip to Part 1 Result.

Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report.

We performed 2 infiltration tests using the Aardvark permeameter at the site within existing Old Paralic Deposits. The following presents the results of our field infiltration tests:

B-2 at 6 feet; Material: Qop; Rate = 0.00 inches/hour
B-3 at 4 feet; Material: Qop; Rate = 0.00 inches/hour

The test results indicate the approximate infiltration rate is 0.00 inches per hour and possesses a "No Infiltration" condition.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A–1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐ Yes	☐ No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B–1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	☐ Yes	☐ No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No

Summarize findings and basis; provide references to related reports or exhibits.

We performed 2 infiltration tests using the Aardvark permeameter at the site within existing Old Paralic Deposits. The following presents the results of our field infiltration tests:

B-2 at 6 feet; Material: Qop; Rate = 0.00 inches/hour
B-3 at 4 feet; Material: Qop; Rate = 0.00 inches/hour

The test results indicate the approximate infiltration rate is 0.00 inches per hour and possesses a "No Infiltration" condition.

Part 1 Result – Full Infiltration Geotechnical Screening[12]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	☐ Full infiltration Condition ☒ Complete Part 2

[12] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
U STOR IT Torrey Pines	Design

Criteria 3: Infiltration Rate Screening	
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☒ No; infiltration testing is conducted (refer to Table D.3–1), continue to Step 3B.
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ☐ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ☒ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ☐ Yes; Continue to Criteria 4. ☒ No: Skip to Part 2 Result.

Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate).

We performed 2 infiltration tests using the Aardvark permeameter at the site within existing Old Paralic Deposits. The following presents the results of our field infiltration tests:

B-2 at 6 feet; Material: Qop; Rate = 0.00 inches/hour
B-3 at 4 feet; Material: Qop; Rate = 0.00 inches/hour

The test results indicate the approximate infiltration rate is 0.00 inches per hour and possesses a "No Infiltration" condition.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 4B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A–1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐ Yes	☐ No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B–1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1:Form I- 8A[10]	
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No

Summarize findings and basis; provide references to related reports or exhibits.

We performed 2 infiltration tests using the Aardvark permeameter at the site within existing Old Paralic Deposits. The following presents the results of our field infiltration tests:

B-2 at 6 feet; Material: Qop; Rate = 0.00 inches/hour
B-3 at 4 feet; Material: Qop; Rate = 0.00 inches/hour

The test results indicate the approximate infiltration rate is 0.00 inches per hour and possesses a "No Infiltration" condition.

Part 2 – Partial Infiltration Geotechnical Screening Result[13]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☒ No Infiltration Condition

[13] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.