City of San Marcos

PRIORITY DEVELOPMENT PROJECT (PDP)
STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)
FOR
Armorlite Lofts
Permit SP23-0001

Armorlite Drive
San Marcos, California 92069

ASSESSOR'S PARCEL NUMBER(S):
219-162-62-00

ENGINEER OF WORK:

latitude 33
PLANNING & ENGINEERING
17031 Treena Street, San Diego CA 92131 • T 858.751.0633 • www.latitude33.com

Gio Posillico **R.C.E. NO. 66332** **EXP. 06-30-25**

PREPARED FOR:

Las Posas Ventures, LLC
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PDP SWQMP PREPARED BY:

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DATE OF SWQMP:
June 6, 2023

PLANS PREPARED BY:
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City of San Marcos PDP SWQMP Template Date: March 15, 2016
PDP SWQMP Preparation Date: 10/23/24

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TABLE OF CONTENTS

ACRONYMS

APN	Assessor's Parcel Number
BMP	Best Management Practice
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: Armorlite Lofts
Permit Application Number: SP23-0001

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of San Marcos BMP Design Manual, which is a design manual for compliance with local City of San Marcos and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

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 BMP Design Manual. 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 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.

R.C.E. 66332 Exp. 06-30-25

Engineer of Work's Signature, PE Number & Expiration Date

Gio Posillico

Print Name

Latitude 33 Planning and Engineering

Company

10/23/2023

Date

Engineer's Seal:

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PDP SWQMP PROJECT OWNER'S CERTIFICATION PAGE

Project Name: Armorlite Lofts
Permit Application Number: SP23-0001

PROJECT OWNER'S CERTIFICATION

This PDP SWQMP has been prepared for Las Posas Ventures, LLC by Latitude 33 Planning & Engineering]. The PDP SWQMP is intended to comply with the PDP requirements of the City of San Marcos BMP Design Manual, which is a design manual for compliance with local City of San Marcos and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

_____

Project Owner's Signature

Dan Tate

Print Name

Las Posas Ventures, LLC

Company

Date

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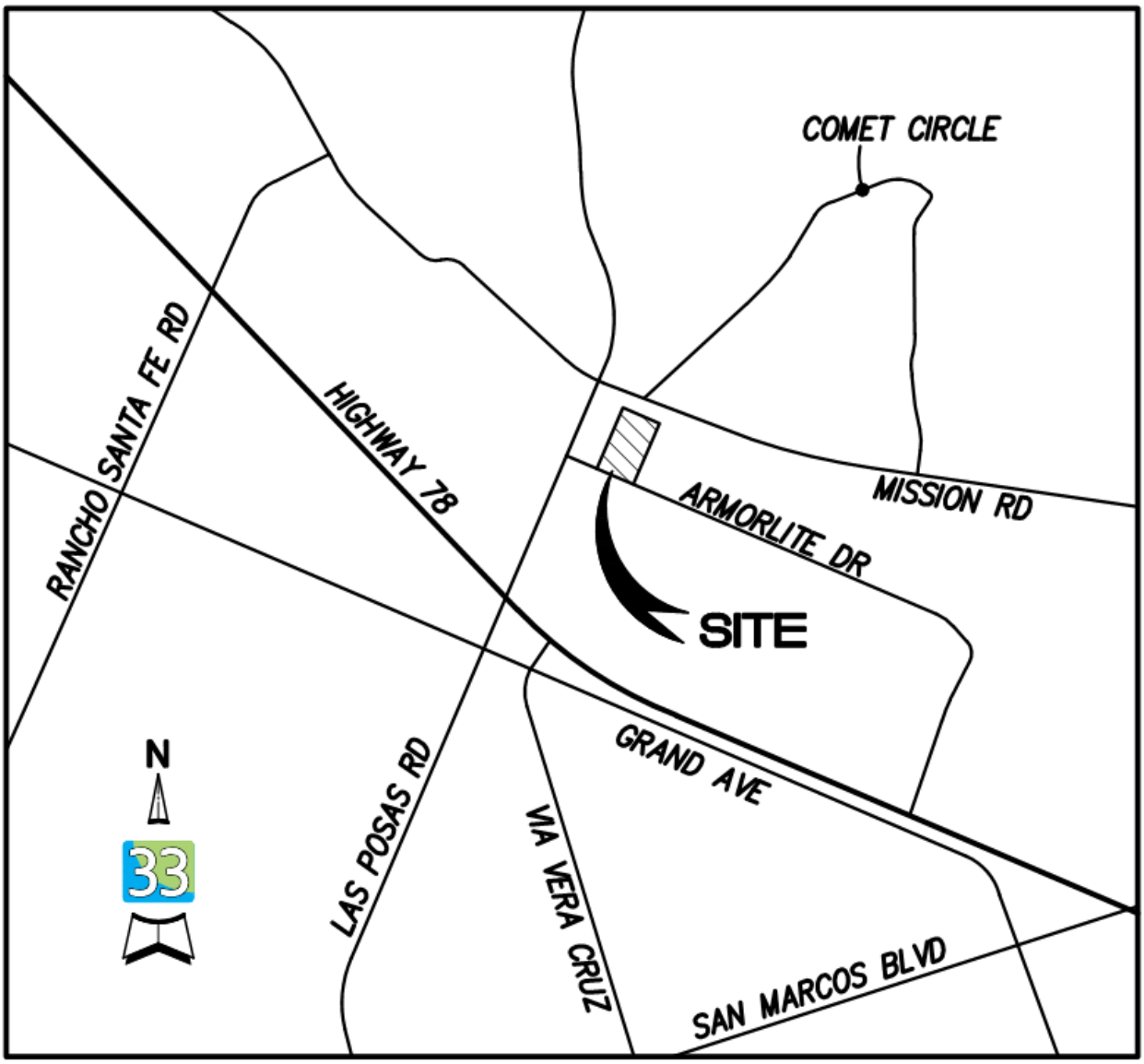
SUBMITTAL RECORD

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 column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Submittal Number	Date	Project Status	Summary of Changes
1	6/6/23	☑ Preliminary Design / Planning/ CEQA ☐ Final Design	Initial Submittal
2	8/11/23	☑ Preliminary Design / Planning/ CEQA ☐ Final Design	Resubmittal
3		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
4		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	

PROJECT VICINITY MAP

Project Name: Armorlite Lofts
Permit Application Number: SP23-0001



VICINITY MAP

NOT TO SCALE

Applicability of Storm Water Best Management Practices (BMP) Requirements

(Storm Water Intake Form for all Development Permit Applications)
For detailed information please visit:
http://www.san-marcos.net/departments/development-services/stormwater/development-planning

Form I-1
[March 15, 2016]

Project Identification

Project Name: Armorlite Lofts

Description:
A four-story apartment complex above a one-story parking garage with an associated outdoor parking lot.

Permit Application Number (if applicable): SDP23-0003 | Date: 6/6/23

Project Address: Armorlite Drive, San Marcos, CA 92069

Determination of Requirements

This form is required as part of the City's application process. The purpose of this form is to identify potential land development planning storm water requirements that apply to development projects.

Development projects are defined as construction, rehabilitation, redevelopment, or reconstruction of any public or private projects. In addition, the identification of a development project, as it relates to storm water regulations, would truly apply to development and redevelopment activities that have the potential to contact storm water and contribute a source of pollutants, or reduce the natural absorption and infiltration abilities of the land.

To access the BMP Design Manual, Storm Water Quality Management Plan (SWQMP) templates, and other pertinent information related to this program please refer to:
http://www.san-marcos.net/departments/development-services/stormwater/development-planning

Please answer each of the following steps below, starting with Step 1 and progressing through each step until reaching "Stop".

Step	Answer	Progression
Step 1: Based on the above, Is the project a "development project" (See definition above)? See Section 1.3 of the BMP Design Manual for further guidance if necessary.	☑ Yes	Go to Step 2.
	☐ No	Permanent BMP requirements do not apply. No SWQMP will be required. Provide brief discussion below. **STOP.**
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, Priority Development Project (PDP), or exception to PDP definitions? **To answer this item, complete Form I-2, Project Type Determination. See Section 1.4 of the BMP Design Manual *in its entirety* for guidance.** **In addition to Section 1.4, please refer to the City's SWQMP Submittal Requirements form.**	☐ Standard Project	Only Standard Project requirements apply, including Standard Project SWQMP. **STOP.**
	☑ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Go to Step 3 on the following page.**
	☐ Exception to PDP definitions	Standard Project requirements apply, and any additional requirements specific to the type of project. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP. **STOP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Form I-1 Page 2, Form Date: March 15, 2016		
Step 3 (PDPs only). Please answer the list of questions in this section to determine if hydromodification requirements reply to the proposed PDP. Does the project:		
Step 3a. Discharge storm water runoff directly to the Pacific Ocean?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Continue to Step 3b.
Step 3b. Discharge storm water runoff directly to an enclosed embayment, not within protected areas?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Continue to Step 3c.
Step 3c. Discharge storm water runoff directly to a water storage reservoir or lake, below spillway or normal operating level?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Continue to Step 3d.
Step 3d. Discharge storm water runoff directly to an area identified in WMAA?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Hydromodification requirements apply to the project. Go to Step 4.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
Step 4 (PDPs subject to hydromodification control requirements only). Does protection of critical coarse sediment yield areas apply based on review of WMAA Potential Critical Coarse Sediment Yield Area Map? See Section 6.2 of the BMP Design Manual 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. Based on review of WMAA Potential Critical Coarse Sediment Yield Area Map, critical coarse sediment yield areas are not located near project site.

Project Type Determination Checklist			Form I-2 [March 15, 2016]
Project Information			
Project Name/Description: Armorlite Lofts			
Permit Application Number (if applicable):			Date: 5/9/23
Project Address: Armorlite Drive, San Marcos, CA 92069			
Project Type Determination: Standard Project or Priority Development Project (PDP)			
The project is (select one): ☑ New Development ☐ Redevelopment			
The total proposed newly created or replaced impervious area is: _91,690__ ft^2 (__2.10___) acres			
Is the project in any of the following categories, (a) through (f)?			
Yes ☑	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☑	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site 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 ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Form I-2 Page 2, Form Date: March 15, 2016			
Yes	No ☑	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging 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). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes	No ☑	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☑	No	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

No – the project is <u>not</u> a Priority Development Project (Standard Project).

☑ Yes – the project is a Priority Development Project (PDP).

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: _____ ft^2 (A)
The total proposed newly created or replaced impervious area is _____ ft^2 (B)
Percent impervious surface created or replaced (B/A)*100: _____%
The percent impervious surface created or replaced is (select one based on the above calculation):

less than or equal to fifty percent (50%) – only new impervious areas are considered PDP

OR

greater than fifty percent (50%) – the entire project site is a PDP

Site Information Checklist For PDPs	Form I-3B (PDPs) [March 15, 2016]
Project Summary Information	
Project Name	Armorlite Lofts
Project Address	Armorlite Drive San Marcos, California 92069
Assessor's Parcel Number(s) (APN(s))	219-162-62-00
Permit Application Number	
Project Hydrologic Unit	Select One: ☐ Santa Margarita 902 ☐ San Luis Rey 903 ☑ Carlsbad 904 ☐ San Dieguito 905 ☐ Penasquitos 906 ☐ San Diego 907 ☐ Pueblo San Diego 908 ☐ Sweetwater 909 ☐ Otay 910 ☐ Tijuana 911
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Hydrologic Unit: Carlsbad Area: San Marcos Subarea: Richland #904.52
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	___2.44_____ Acres (___106,442___ Square Feet)
Area to be Disturbed by the Project (Project Area)	___2.44_____ Acres (___106,442___ Square Feet)
Project Proposed Impervious Area (subset of Project Area)	___2.10_____ Acres (___91,690____ Square Feet)
Project Proposed Pervious Area (subset of Project Area)	___0.34_____ Acres (___14,760____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Description of Existing Site Condition

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

- ☐ Existing development
- ☐ Previously graded but not built out
- ☐ Demolition completed without new construction
- ☐ Agricultural or other non-impervious use
- ☑ Vacant, undeveloped/natural

Description / Additional Information:
The existing condition is comprised of undeveloped vegetative area.

Existing Land Cover Includes (select all that apply):

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

Description / Additional Information:

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 (GW):

- ☐ GW Depth < 5 feet
- ☐ 5 feet < GW Depth < 10 feet
- ☐ 10 feet < GW Depth < 20 feet
- ☑ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

- ☐ Watercourses
- ☐ Seeps
- ☐ Springs
- ☐ Wetlands
- ☑ None

Description / Additional Information:
This is an undeveloped lot with waist high vegetation that has no evidence of the above natural hydrologic features. There is a high point central to the site, therefore drainage flows in all directions and does not become concentrated on the property.

Description of Existing Site Drainage Patterns

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) Is runoff from offsite conveyed through the site? if yes, quantify 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 any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of 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.

Describe existing site drainage patterns:

1. Natural
2. There are no offsite runoff on this site due to the existing topography. The property appears to be elevated compared to the surrounding property.

3. There is a high point central to the site, therefore drainage flows in all directions. There are two inlets located at the southwest intersection (Las Posas Rd. & Armorlite Dr.) 200' away from property.

4. The runoff has been broken into 3 POC's in the existing condition:

POC 1 (SW)
POC 2 (W)
POC 3 (NE)

Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
The project proposes construction of a 4-story mixed-use residential/commercial development with a 1-story podium garage, and associated surface improvements including exposed parking areas, pedestrian walking paths, and outdoor amenities. Proposed underground utilities include storm drain, sewer, water, gas, irrigation, electrical, and telecommunications.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
-Proposed 4-story stacked flats above 1-story parking structure
-Private drive aisle
-Parking Stalls
-Private Sidewalk

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

Does the project include grading and changes to site topography?
☑ Yes
☐ No

Description / Additional Information:

Description of Proposed Site Drainage Patterns

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 or 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.

Describe proposed site drainage patterns:

Post construction surface drainage will be collected via sheet flow. In DMA 1, storm water will sheet to the designated low point in the parking lot and be collected by combination of area drains, trench drains and drain inlet. The flow confluences at the drain inlet and will then convey captured flow to BMP1 MWS (MWS-L-8-20-V). The entirety of drainage from the building footprint will be collected via roof drains and directly piped to BMP 1 MWS. In DMA 2, storm water will sheet flow to a different designated low point in the drive aisle and be captured via BMP 2 MWS (MWS-L-8-8-V). The treated flow from BMP1 and BMP2 will then flow into a storm water detention system under the drive aisle before it ultimately discharges to the existing POC (POC 1). There is 0.09 acres of pervious area, DMA3, considered self-mitigating, that flows south and discharges to the existing landscape parkway via sidewalk underdrain. This runoff eventually reaches the existing storm drain inlet (POC 1) and is accounted for.

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

- [x] On-site storm drain inlets
- [ ] Interior floor drains and elevator shaft sump pumps
- [x] Interior parking garages
- [ ] Need for future indoor & structural pest control
- [x] Landscape/Outdoor Pesticide Use
- [x] 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
- [ ] Fire Sprinkler Test Water
- [ ] Miscellaneous Drain or Wash Water
- [x] Plazas, sidewalks, and parking lots

Description / Additional Information:
The site will be mixed-use 4-story stacked flats above 1-level podium garage and associated landscaped areas and private parking/drive aisle.

Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
Project runoff enters the public storm drain system along Armorlite Drive. Runoff crosses Route 78 and eventually discharges into San Marcos Lake. Runoff eventually enters into the Pacific Ocean via San Marcos Creek and Batiquitos Lagoon.

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	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
San Marcos Creek	Benthic Community Effects, Dichlorodiphenyldichloroethylene (DDE), Indicator Bacteria, Phosphorus, Toxicity, Selenium	Nutrients
San Marcos Lake (Upper)	Ammonia as N, Copper, Nutrients, Phosphorous	
San Marcos Lake (Lower)		Indicator Bacteria
San Marcos, Lake, drain to central southwest fork of Lake	Copper, Indicator Bacteria	

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 expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Expected 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			

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

- ☑ 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):

Critical Coarse Sediment Yield Areas*

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

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

- ☐ Yes
- ☑ No, No critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the BMP Design Manual been performed?

- ☐ 6.2.1 Verification of Geomorphic Landscape Units (GLUs) Onsite
- ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment
- ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
- ☐ No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

- ☐ No critical coarse sediment yield areas to be protected based on verification of GLUs onsite
- ☐ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 2.b of the SWQMP.
- ☐ Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:
Per the CCSYA Exhibit provided in Attachment 2b, there is no course sediment present on site.

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.

POC 1 is the point at which the project's main private storm drain leaves the site, prior to its connection to the existing public storm drain system within the Armorlite right-of-way. Treated/stored surface runoff from BMPs 1, 2, and 3 (MWS'/Storage Vault) discharges to a proposed cleanout that ultimate connects to the existing storm drain system. POC 2 is self-mitigating pervious landscape area that sheet flows North East of the site, similar to the existing condition drainage pattern. POC 3 is also self-mitigating pervious landscape area that sheet flows west like the existing condition drainage pattern.

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

- ☐ No, the low flow threshold is 0.1Q2 (default low flow threshold)
- ☐ Yes, the result is the low flow threshold is 0.1Q2
- ☑ Yes, the result is the low flow threshold is 0.3Q2
- ☐ Yes, the result is the low flow threshold is 0.5Q2

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

See Channel Screening Analysis performed by Delane Engineering, Inc. titled "Karl Strauss San Marcos Tasting Room and Garden" dated 11/18/19.

Discussion / Additional Information: (optional)

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 proposed driveway will require the removal and replacement of the existing storm water management facilities fronting the project site. Per As-Built Dwg No. IP-4883, 12 existing Silva Cells will need to be removed and replaced-in-kind further down Armorlite Drive to the west. Approximately 200 SF of landscape planting area at 3' wide landscape panel will be installed. The landscape area and respective silva cells will not encroach into the existing bike and pedestrian paths.

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.

Source Control BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)	Form I-4 [March 15, 2016]

Project Identification

Project Name: Armorlite Lofts

Permit Application Number: SDP23-0003

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the Model BMP Design Manual 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 Model 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?		
SC-1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if SC-3 not implemented:			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if SC-4 not implemented:			

Source Control Requirement	Applied?		
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
SC-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 and Equipment Cleaning	☐ 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
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Site Design BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)	Form I-5 [March 15, 2016]

Project Identification

Project Name: Armorlite Lofts

Permit Application Number: XXXXX

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the Model BMP Design Manual 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 Model 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.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-1 not implemented: Existing site was undeveloped. Developed condition proposes entirety of site related discharge to POC 1.			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-2 not implemented: Existing site was undeveloped. Developed condition proposes entirety of site related discharge to POC 1. Permeable landscape areas provided where possible.			
SD-3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			
SD-5 Impervious Area Dispersion	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			

Form I-5 Page 2 of 2, Form Date: March 15, 2016			
Site Design Requirement	**Applied?**		
SD-6 Runoff Collection	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-8 not implemented: There will be no irrigation demand for this project site within 36 hours of a rain event. The proposed structure will not be dual plumbed, so there will be no grey water demand for the project site. Given that the City of San Marcos requires a 36-hr drawdown time for harvest and use, this type of BMP is not feasible for this project.			

Summary of PDP Structural BMPs	Form I-6 (PDPs) [March 15, 2016]

Project Identification

Project Name: Armorlite Lofts

Permit Application Number: XXXXX

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). 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 local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 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.

This site will utilize 2-MWS, and a stormwater detention vault as sources of structural BMP's. These BMP's will collect water from all impervious areas before it is discharged off site.
Flow-thru treatment is required to treat runoff from the proposed development. Biofiltration basins were deemed infeasible due to lack of space within the parkways and grading of the lot. A Modular Wetland Device was chosen for it's ability to provide biofiltration mitigation with a significantly smaller footprint. See Worksheets B.5-6 for sizing. For HMP mitigation, an underground vault system will be utilized to mitigate the 0.3Q2-Q10 storm events. The Clear Water spreadsheet was used to size the vault system.

(Continue on page 2 as necessary.)

(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from page 1)

The implementation strategy was as follows:

Step 1 – The DMAs will require treatment and DCVs were calculated for those DMAs.

Step 2 – Per the included Harvest and Use feasibility screening, Form I-7, the proposed project is considered to be infeasible for harvest and use. Infiltration has been deemed infeasibile per Geotechnical Recommendations (Infiltration Testing & Form I-8).

Step 3 – Two Modified Wetland System's have been sized for pollutant control and a Stormwater Detention System has been sized for hydromodification purposes for DMA 1/2. See Attachments 1e and 2d for calculations.

Step 4 – A Modified Wetland System, and Stormwater Detention System, been sized and placed accordingly to treat the required runoff generated per the proposed development.

Step 5 – For the MWS, Worksheet B.5-1 and Worksheet B.6-1 have been completed.

Step 6 - See SWQMP hereon.

Step 7 - See "Storm Water Management and Discharge Control Maintenance Agreement" form for O&M information.

Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. 1

Construction Plan Sheet No.

Type of structural BMP:
- ☐ Retention by harvest and use (HU-1)
- ☐ 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)
- ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
- ☑ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
- ☐ 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 forms if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual)	Gio Posillico, PE | RCE 66332 10731 Treena Street San Diego, CA 92131
Who will be the final owner of this BMP?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101
Who will maintain this BMP into perpetuity?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101
What is the funding mechanism for maintenance?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101

Structural BMP ID No. 1

Construction Plan Sheet No.

Discussion (as needed):

BMP 1: Modular Wetlands System located along landscaped area in west side of parking lot.

BMP 1 (8'x20' Open Planter Modular Wetlands System) was sized utilizing worksheet B.601 (see calculation worksheets in Attachment 1e). The required minimum treatment flow rate for BMP 1 from worksheet B.6-1 is 0.498 cfs. The proposed BMP 1 has a treatment rate of 0.577 cfs.

Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. 2

Construction Plan Sheet No.

Type of structural BMP:
- ☐ Retention by harvest and use (HU-1)
- ☐ 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)
- ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
- ☑ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
- ☐ 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 forms if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual)	Gio Posillico, PE | RCE 66332 10731 Treena Street San Diego, CA 92131
Who will be the final owner of this BMP?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101
Who will maintain this BMP into perpetuity?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101
What is the funding mechanism for maintenance?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101

Structural BMP ID No. 2

Construction Plan Sheet No.

Discussion (as needed):

BMP 2: Modular Wetlands System located in landscaped area near Armorlite right-of-way.

BMP 2 (4'x8' Modular Wetlands System) was sized utilizing worksheet B.601 (see calculation worksheets in Attachment 1e). The required minimum treatment flow rate for BMP 1 from worksheet B.6-1 is 0.099 cfs. The proposed BMP 1 has a treatment rate of 0.115 cfs.

Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. 3

Construction Plan Sheet No.

Type of structural BMP:
- ☐ Retention by harvest and use (HU-1)
- ☐ 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)
- ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
- ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
- ☐ 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 forms if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual)	Gio Posillico, PE | RCE 66332 10731 Treena Street San Diego, CA 92131
Who will be the final owner of this BMP?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101
Who will maintain this BMP into perpetuity?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101
What is the funding mechanism for maintenance?	Las Posas Ventures, LLC or its successors 705 B Street, Suite 3010 San Diego, CA 92101

Structural BMP ID No. 3

Construction Plan Sheet No.

Discussion (as needed):

BMP 3: Storm water detention vault located in the parking lot.

SWMM 5.2 was used to size the vault to meet flow control requirements and is a conjunctive use for 100-yr detention. The proposed vault is 3,350 sq. ft and sized to detain flows from DMA-1, DMA-2, and DMA-3 in order to satisfy HMP requirements when evaluating pre and post condition runoff at POC1.

ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☑ 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	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☑ 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	☑ Included

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

The DMA 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
- ☑ Existing topography and impervious areas
- ☑ Existing and proposed site drainage network and connections to drainage offsite
- ☑ Proposed demolition
- ☑ Proposed grading
- ☑ Proposed impervious features
- ☑ Proposed design features and surface treatments used to minimize imperviousness
- ☑ 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)
- ☑ Structural BMPs (identify location, type of BMP, and size/detail)

ATTACHMENT 1a
DMA EXHIBIT

LEGEND

- PROPOSED FLOW PATH
- DMA BOUNDARY
- 250 — PROPOSED CONTOUR
- IMPERVIOUS AREA
- PERVIOUS LANDSCAPE

DMA SUMMARY TABLE				
NAME	AREA (SF)	SOIL TYPE	POST PROJECT SURFACE	
1	71,730	C	IMPERVIOUS AREA	
	6,110	C	PERVIOUS AREA	
2	19,450	C	IMPERVIOUS AREA	
	5,500	C	PERVIOUS AREA	
TOTAL AREA	102,790	TREATED BY	MECHANICALLY TREATED BMP'S	
3	3,505	C	SELF-MITIGATING PERVIOUS AREA	
	135	C	INCIDENTAL IMPERVIOUS AREA	

*** HMP CONTROL BY BMP 3: STORMWATER DETENTION SYSTEM**

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: PROPOSED DRAINAGE CAPTURES POST DEVELOPMENT DRAINAGE ONSITE AND IS CONVEYED VIA PRIVATE STORM DRAIN SYSTEMS BEFORE DISCHARGING INTO THE EXISTING STORM DRAIN SYSTEM ON ARMORLITE DRIVE. SELF-MITIGATING PERVIOUS AREA FROM DMA 3 FOLLOWS EXISTING DRAINAGE PATTERNS AND SHEETFLOW OFF-SITE RESPECTIVELY.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON. SEE FORM I-5 FOR EXPLANATION.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLES.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE FORMS 1-3B AND 1-4 FOR EXPLANATION.

STRUCTURAL BMPS: SHOWN HEREON. SEE DETAILS.

EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: SOIL CLASS TYPE "C"

GROUNDWATER: FREE GROUNDWATER WAS NOT ENCOUNTERED IN THE EXPLORATORY BORINGS PER REPORT BY ALTA CALIFORNIA GEOTECHNICAL, INC., ENTITLED "PRELIMINARY GEOTECHNICAL INVESTIGATION, LOS POSAS ROAD AND ARMORLITE DRIVE CITY OF SAN MARCOS, CALIFORNIA" DATED MARCH 31, 2021 (1-0371). GROUND WATER LEVELS ARE ANTICIPATED TO BE GREATER THAN 100 FEET BELOW THE GROUND SURFACE.

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: **THIS SITE IS NOT LOCATED WITHIN A CCSYA, SEE CCSYA EXHIBIT IN ATTACHMENT 2.**

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON.

EXISTING DRAINAGE: THE EXISTING SITE IS UNDEVELOPED AND IS COMPLETELY SELF-MITIGATING PERVIOUS AREA.

N

0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

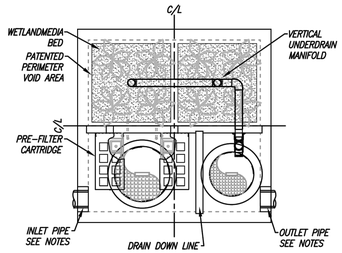
DMA EXHIBIT
ARMORLITE LOFTS
ATTACHMENT 1A

SCALE: 1"=30'
DATE: 2023-10-24
SHEET NO: 1 OF 2
PREPARED BY: DN

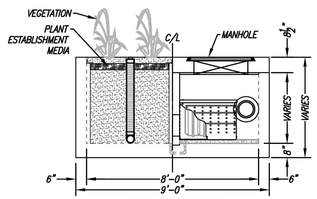
latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
FLOW BASED (CFS)			
0.231			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	**560.10**		
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	**558.60**		
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	**561.85**	**561.85**	**561.85**
SURFACE LOAD	PEDESTRIAN		
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



PLAN VIEW



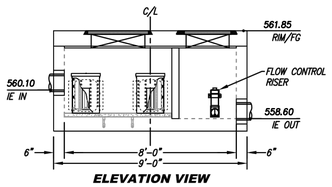
LEFT END VIEW

INSTALLATION NOTES

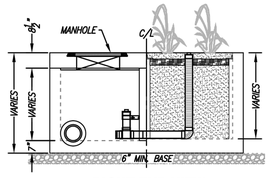
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT CONTECH.



ELEVATION VIEW



RIGHT END VIEW

TREATMENT FLOW (CFS)	0.231
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

CONTECH ENGINEERED SOLUTIONS LLC www.ContechES.com

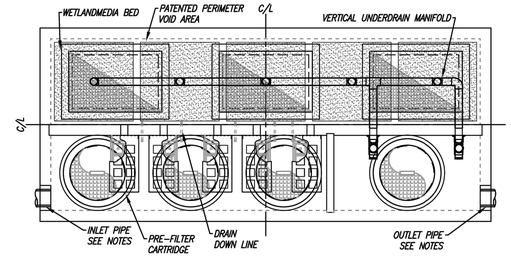
MWS-L-8-8-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

BMP2: MODULAR WETLAND SYSTEM

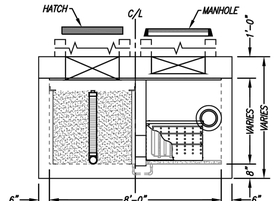
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NUMBER		1900.00	
PROJECT NAME		ARMORLITE LOFTS	
PROJECT LOCATION		225 N. LAS POSAS ROAD	
STRUCTURE ID		1	
TREATMENT REQUIRED			
FLOW BASED (CFS)			
0.577			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	**563.00**		
INLET PIPE 2	**563.00**	N/A	N/A
OUTLET PIPE	**561.00**		
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	**564.35**	**564.35**	**564.35**
SURFACE LOAD	DIRECT TRAFFIC		
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



PLAN VIEW



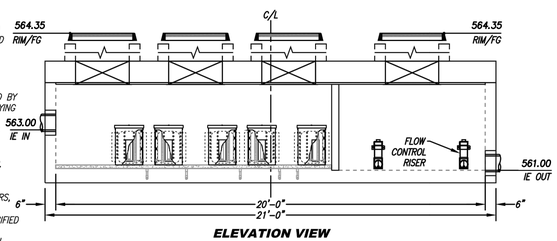
LEFT END VIEW

INSTALLATION NOTES

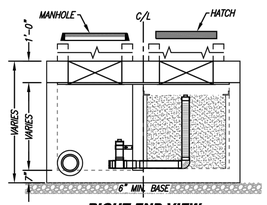
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT CONTECH.



ELEVATION VIEW



RIGHT END VIEW

TREATMENT FLOW (CFS)	0.577
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

CONTECH ENGINEERED SOLUTIONS LLC www.ContechES.com

MWS-L-8-20-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

BMP 1: MODULAR WETLAND SYSTEM

NOT TO SCALE

DMA EXHIBIT
ARMORLITE LOFTS
ATTACHMENT 1A

SCALE: 1"=30'
DATE: 2023-08-10
SHEET NO: 2 OF 2
PREPARED BY: DN

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

ATTACHMENT 1c

FORM I-7, HARVEST AND USE FEASIBLITY SCREENING CHECKLIST

Harvest and Use Feasibility Checklist	**Form I-7**

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:_____

There will be no irrigation demand for this project site within 36 hours of a rain event. The proposed structure will not be dual plumbed, so there will be no grey water demand for the project site. Given that the City of San Marcos requires a 36 hour draw down time for harvest and use, this type of BMP is not feasible for this project.

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]

3. Calculate the DCV using worksheet B-2.1.

DCV = 3,683 (cubic feet)

BMP 1 = 3071, BMP 2 = 612
DCV = 3,683 cubic feet = 27,551 gallons
0.25DC = 921 cubic feet = 6,890 gallons

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.

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.

☑ No, select alternate BMPs.

ATTACHMENT 1d

FORM I-8, CATEGORIZATION OF INFILTRATION FEASIBILITY CONDITION

Categorization of Infiltration Feasibility Condition	Form I-8

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

An infiltration testing evaluation was performed at the site, by borehole method to obtain percolation rates that were converted to infiltration rates via Porchet method.
Site specific testing resulted in rates of 0.1 and 0.4 inches per hour.

GeoTek, Inc. "Preliminary Geotechnical Evaluation, Eastern Portion of 225 N. Las Posas Road, San Marcos, California 92069," Project No. 3685-SD, dated May 30, 2023.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	No

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

An infiltration testing evaluation was performed at the site, by borehole method to obtain percolation rates that were converted to infiltration rates via Porchet method.
Site specific testing resulted in rates of 0.1 and 0.4 inches per hour.

GeoTek, Inc. "Preliminary Geotechnical Evaluation, Eastern Portion of 225 N. Las Posas Road, San Marcos, California 92069," Project No. 3685-SD, dated May 30, 2023.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

Based on the underlying geology, granitic rock is shallow and will create a groundwater mounding affect.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: Based on the underlying geology, granitic rock is shallow and will create a shallow ground water condition. A review of Geotracker.com did not reveal environmental concerns immediately adjacent to the property. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Although GeoTek does not practice in water rights consultation, infiltration of surface waters into the subsurface does not appear to violate downstream water rights. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result *	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		No Infiltration

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

ATTACHMENT 1e

POLLUTION CONTROL BMP DESIGN WORKSHEETS

San Diego County
85 th Percentile Isopluvials

PROJECT SITE
D = 0.69"

Legend
- 85th PERCENTILE ISOPLUVIAL
- INCORPORATED CITY

NOTE:
The 85th percentile is a 24 hour rainfall total. It represetns a value such that 85% of the observed 24 hour rainfall totals will be less than that value.

N

0 1 2 4 6 8 Miles

05/14/2015
P:\Flood Control\NOAA_ATLAS_14\PCT85_REVISITED_2015\
\PCT85_DISPLAY.mxd

LUEG GIS
Land Use & Environment Group
Geographic Information Service

SCALE: 1" = 30,000'

DATE: 08/10/2023

JOB NO.: 1900.00

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

Automated Worksheet B.1: Calculation of Design Capture Volume (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	1	2									unitless
	2	85th Percentile 24-hr Storm Depth	0.69	0.69									inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	71,735	19,358									sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	6,111	5,403									sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Initial Runoff Factor Calculation	22	Total Tributary Area	77,846	24,761	0	0	0	0	0	0	0	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.85	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.85	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	26	Initial Design Capture Volume	3,805	1,068	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.85	0.75	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	3,805	1,068	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.85	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	36	Final Effective Tributary Area	66,169	18,571	0	0	0	0	0	0	0	0	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	3,805	1,068	0	0	0	0	0	0	0	0	cubic-feet

No Warning Messages

Automated Worksheet B.2: Retention Requirements (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Basic Analysis	1	Drainage Basin ID or Name	1	2	-	-	-	-	-	-	-	-	unitless
	2	85th Percentile Rainfall Depth	0.69	0.69	-	-	-	-	-	-	-	-	inches
	3	Predominant NRCS Soil Type Within BMP Location	C	C									unitless
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Restricted	Restricted									unitless
	5	Nature of Restriction	Soil Type	Soil Type									unitless
	6	Do Minimum Retention Requirements Apply to this Project?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No	No									yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	Yes	Yes									yes/no
	9	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000									in/hr
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.000	0.000	-	-	-	-	-	-	-	-	in/hr
	11	Percent of Average Annual Runoff that Must be Retained within DMA	1.5%	1.5%	-	-	-	-	-	-	-	-	percentage
	12	Fraction of DCV Requiring Retention	0.01	0.01	-	-	-	-	-	-	-	-	ratio
	13	Required Retention Volume	38	11	-	-	-	-	-	-	-	-	cubic-feet

No Warning Messages

Worksheet B.3 - Sizing Modular Wetland System

Category	#	Description	*i*	*ii*	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	1	2	unitless
	1	Final Effective Tributary Area	66,169	18,571	sq-ft
	2	Final Adjusted Runoff Factor	0.85	0.75	unitless
	3	Final Design Capture Volume Tributary to BMP	3,805	1,068	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	100	100	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	-3,705	-968	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.577	0.231	CFS
Flow Rate Calculations	7	Adjustment Factor	1.50	1.50	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	0.20	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.456	0.128	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	Yes	Yes	unitless

MODULAR WETLANDS™

*Advanced **Stormwater** Biofiltration*

MWS Linear

Contents

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.

Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.

MWS Linear

The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.

Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.

Streets

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.

Mixed Use

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

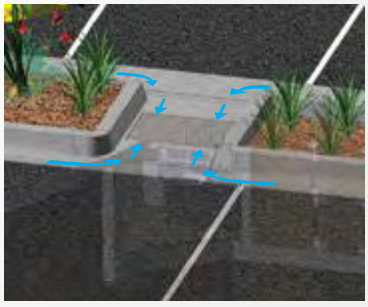
- Agriculture
- Reuse
- Low Impact Development
- Waste Water

Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.

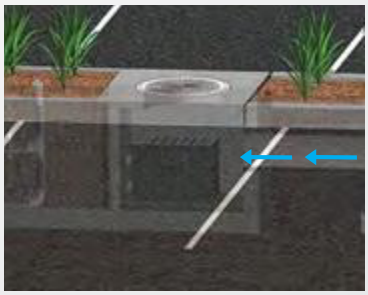
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

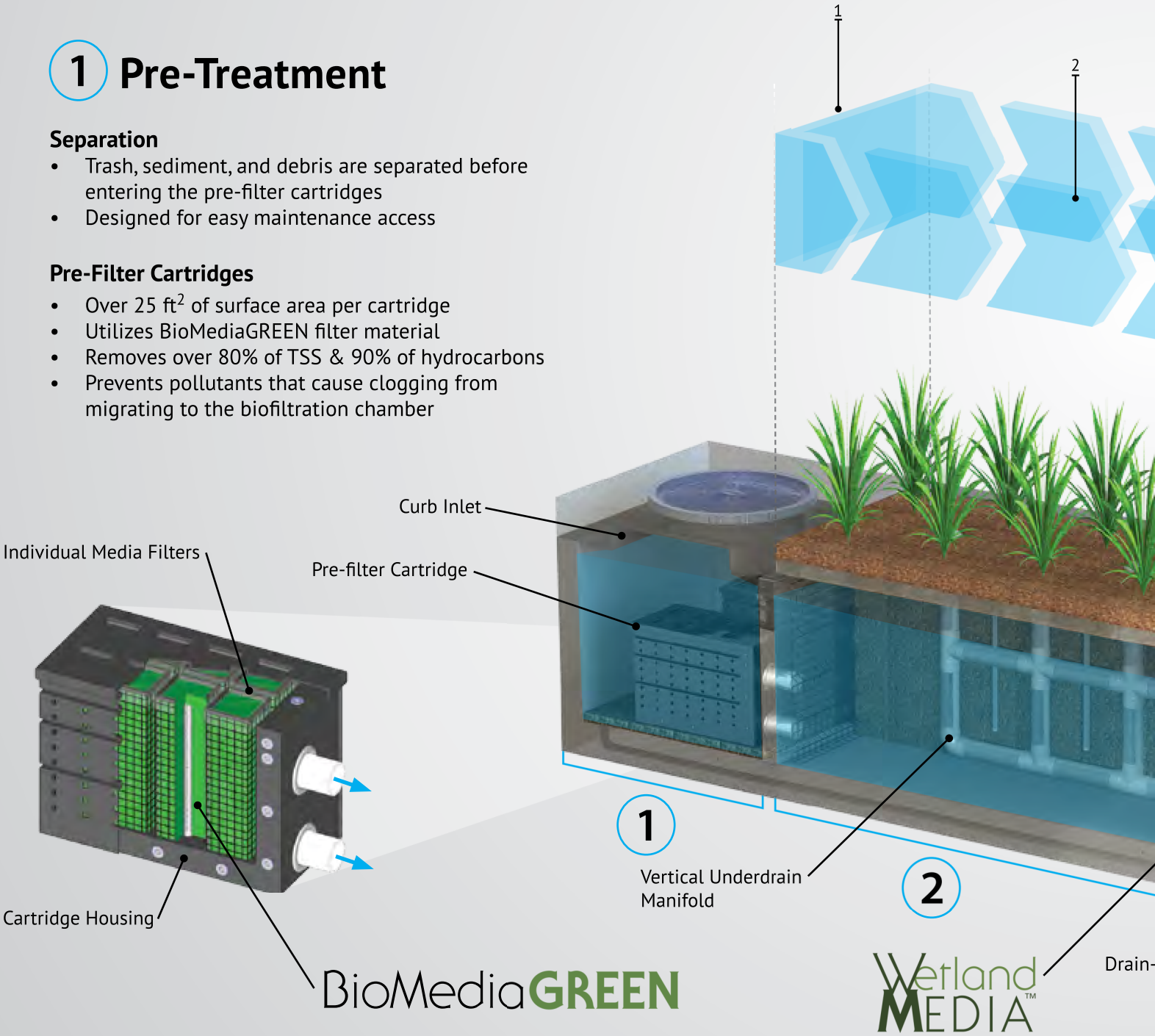
1 Pre-Treatment

Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



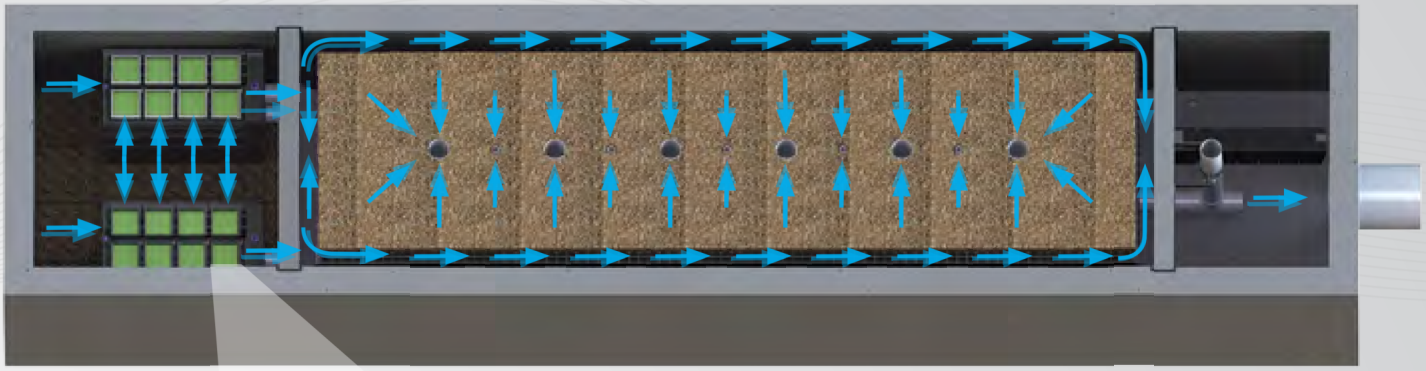


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.

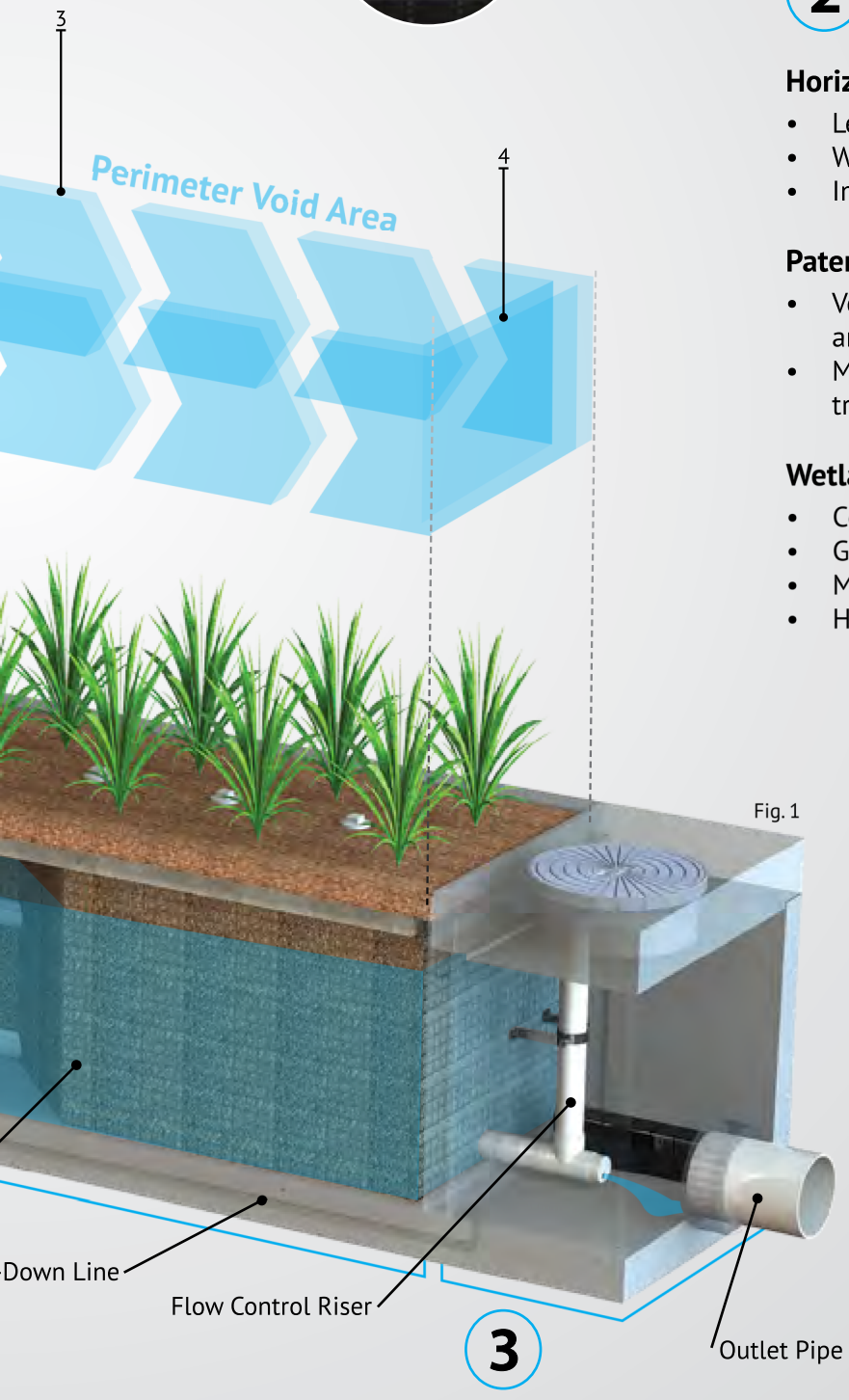


Fig. 1

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations

Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

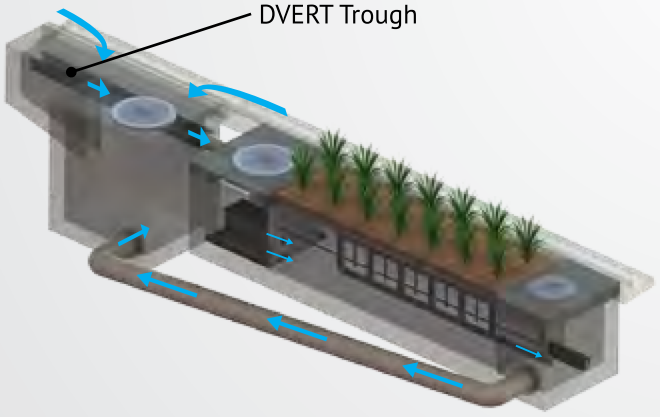
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.

Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.

Washington State DOE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%

DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.

MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.

Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus for discharges to freshwater systems, and 30% Total Nitrogen for discharges to saltwater or tidal systems.

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.

Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.

Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit www.ModularWetlands.com/Plants for more information and various plant lists.

2018

Project: All Related

Subject: MWS Linear BMP Classification Per San Diego Manual

To Whom it May Concern:

Based upon definitions of Biofiltration as found in Section 2.2.1 and Appendix F of the Manual the MWS Linear meets the criteria to be classified as biofiltration and therefore is not flow through treatment and thus does not trigger the need for alternative compliance. The MWS Linear has GULD approval for basic, phosphorus and enhanced treatment under the TAPE approval. The system is certified under the TAPE approval at a loading rate of 1 gpm/sq ft for all three pollutant categories. This is consistent with the performance criteria related to the performance of Appendix F.

Let us first address the comment regarding the MWS (referring to the Modular Wetland System Linear) being flow through treatment. To do so let us look at the definition of biofiltration as provided by the Design Manual which states:

> *"For situations where onsite retention of the 85th percentile storm volume is not feasible, biofiltration must be provided to satisfy specific "biofiltration standards" i.e. a set of selection, sizing, design and operation and maintenance (O&M) criteria that must be met for a BMP to be considered a "biofiltration BMP" – see Section 2.2.1 and Appendix F."*

If we look at section 2.2.2 Storm Water Pollutant Control Performance Standard it states:

> *"(i) If it is not technically feasible to implement retention BMPs for the full DCV onsite for a PDP, then the PDP shall utilize biofiltration BMPs for the remaining volume not reliably retained. Biofiltration BMPs must be designed as described in Appendix F to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP, and must be sized to:*
>
> > *[a]. Treat 1.5 times the DCV not reliably retained onsite, OR*
> >
> > *[b]. Treat the DCV not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite."*

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As the manual states Biofiltration BMPs must be designed as described in Appendix F which states:

> *"A project applicant must be able to affirmatively demonstrate that a given BMP is designed and sized in a manner consistent with this definition to be considered as a "biofiltration BMP" as part of a compliant storm water management plan."*
>
> *"This appendix contains a checklist of the key underlying criteria that must be met for a BMP to be considered a biofiltration BMP. The purpose of this checklist is to facilitate consistent review and approval of biofiltration BMPs that meet the "biofiltration standard" defined by the MS4 Permit."*
>
> *"This checklist includes specific design criteria that are essential to defining a system as a biofiltration BMP; however it does not present a complete design basis. This checklist was used to develop BMP Fact Sheets for PR-1 biofiltration with partial retention and BF-1 biofiltration, which do present a complete design basis. Therefore, biofiltration BMPs that substantially meet all aspects of the Fact sheets PR-1 or BF-1 should be able to complete this checklist without additional documentation beyond what would already be required for a project submittal."*
>
> *"Other biofiltration BMP designs (including both non-proprietary and proprietary designs) may also meet the underlying MS4 Permit requirements to be considered biofiltration BMPs. These BMPs may be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in this appendix, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with their performance certifications (See explanation in Appendix F.2), if applicable, and (3) are acceptable at the discretion of the [City Engineer]. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met."*

As stated the Biofiltration BMP must meet three objectives. The following outlines how the Modular Wetland System Linear meets these criteria.

Minimum Design Criteria

1. Biofiltration BMPs shall be allowed only as described in the BMP selection process in this manual (i.e., retention feasibility hierarchy).

    a. The Modular Wetland System Linear (MWS Linear) is only being proposed on plans when retention via infiltration or reuse is proven infeasible. Conditions such as soils with little to no infiltration rate or sites in which insufficient landscaping warrant to successful implementation of reuse systems.

2. Biofiltration BMPs must be sized using acceptable sizing methods described in this manual.

    a. Section B.5.2 Basis for Minimum Sizing Factor for Biofiltration BMPs states:

    "The MS4 Permit describes conceptual performance goals for biofiltration BMPs and specifies numeric criteria for sizing biofiltration BMPs (See Section 2.2.1 of this Manual). However, the MS4 Permit does not define a specific footprint sizing factor or design profile that must be provided for the BMP to be considered "biofiltration."

    "Additionally, it does not apply to alternative biofiltration designs that utilize the checklist in Appendix F (Biofiltration Standard and Checklist). Acceptable alternative designs (such as proprietary systems meeting Appendix F criteria) typically include design features intended to allow acceptable performance with a smaller footprint and have undergone field scale testing to evaluate performance and required O&M frequency."

    As stated in the Manual alternative biofiltration designs are allowed. The MWS Linear therefore qualifies as a biofiltration BMP under this definition as it has both undergone field scale testing (TAPE tested and approved with a GULD) and provides requirements on O&M frequency. In addition, the MWS Linear can be sized to treat either 1.5 times the DCV not reliably retained onsite OR 1.0 times the portion of the DCV not reliably retained onsite; and additionally check that the system has a total static (i.e. non-routed) storage volume, including pore spaces and pre-filter detention volume to at least 0.75 times the portion of the DCV not reliably retained onsite.

3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.

    a. The MWS Linear is utilized and placed in the same manner as other types of biofiltration systems. As with other biofiltration systems the MWS Linear includes and underdrain for the remaining portion of the DCV that is not retained via incidental infiltration (as biofiltration if infiltration is not feasible due to poor soils) and evapotranspiration. The MWS Linear can be design with an open bottom to maximize this incidental infiltration. The only exception to this, as with other biofiltration BMPs, is when the geotechnical consultant recommends an impervious liner be used due to specific soil conditions such as expansive clays. Additionally, the MWS Linear utilizes an amended media that is much more porous than the standard prescribed biofiltration media which is a mix of sand and compost. 100% of the media uses in the MWS Linear has interparticle voids of 48% plus and 24% internal void space for each media particle. This is much greater than the sand which has interparticle voids of 35% and internal voids of 0%. As such, the MWS Linear retains greater moisture which allows for greater volume retention and ultimately evapotranspiration via respiration of the contained vegetation.

4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control/sequestration processes, and minimize potential for pollutant washout.

    a. The manual states:

    "Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the City or County LID Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below."

    The MWS Linear has been tested under the Washington State TAPE protocol which is full scale field testing and has received General Use Level Designation under that protocol. Table F.1-1, as shown below, requires a biofiltration BMP to have Basic Treatment, Phosphorus Treatment, and Enhanced Treatment under this protocol. The MWS Linear has GULD approval for all three and therefore meets this minimum requirement 4. A copy of the TAPE approval has been attached to this document.

Table F.1-1: Required Technology Acceptance Protocol-Ecology Certifications for Polltuants of Concern for Biofiltration Performance Standard

Project Pollutant of Concern	Required Technology Acceptance Protocol-Ecology Certification for Biofiltration Performance Standard
Trash	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Sediments	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Oil and Grease	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Nutrients	Phosphorus Treatment[1]
Metals	Enhanced Treatment
Pesticides	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment
Organics	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment
Bacteria and Viruses	Basic Treatment (including bacteria removal processes)[3] , Phosphorus Treatment, Enhanced Treatment
Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment

5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.

    a. The MWS Linear an advanced vegetated biofiltration system based that promote biological processes found in both upland bioretention systems and wetlands. The system utilizes an advanced horizontal flow design to ensure maximum contact with the vegetation root mass. Bacterial growth, supported by the root system in the wetland chamber, performs a number of treatment processes. These vary as a function of moisture, temperature, pH, salinity, and pollutant concentrations. Biologically available forms of nitrogen, phosphorus, and carbon are actively taken into the cells of vegetation and bacteria, and used for metabolic processes (i.e., energy production and growth). Nitrogen and phosphorus are actively taken up as nutrients that are vital for a number of cell functions, growth, and energy production. These processes remove metabolites from the media during and between storm events, making the media available to capture more nutrients from subsequent storms.

    b. Soil organisms in the wetland chamber can break down a wide array of organic compounds into less toxic forms or completely break them down into carbon dioxide and water (Means and Hinchee 1994). Bacteria can also cause metals to precipitate out as salts, bind them within organic material, and accumulate metals in nodules within the cells. Finally, plant growth may metabolize many pollutants, sequester them or rendering them less toxic (Reeves and Baker 2000).

    c. Following are pictures from the plants pulled from a MWS Linear after only 14 months of growth. The media used in the system is designed to maximize biological activity:

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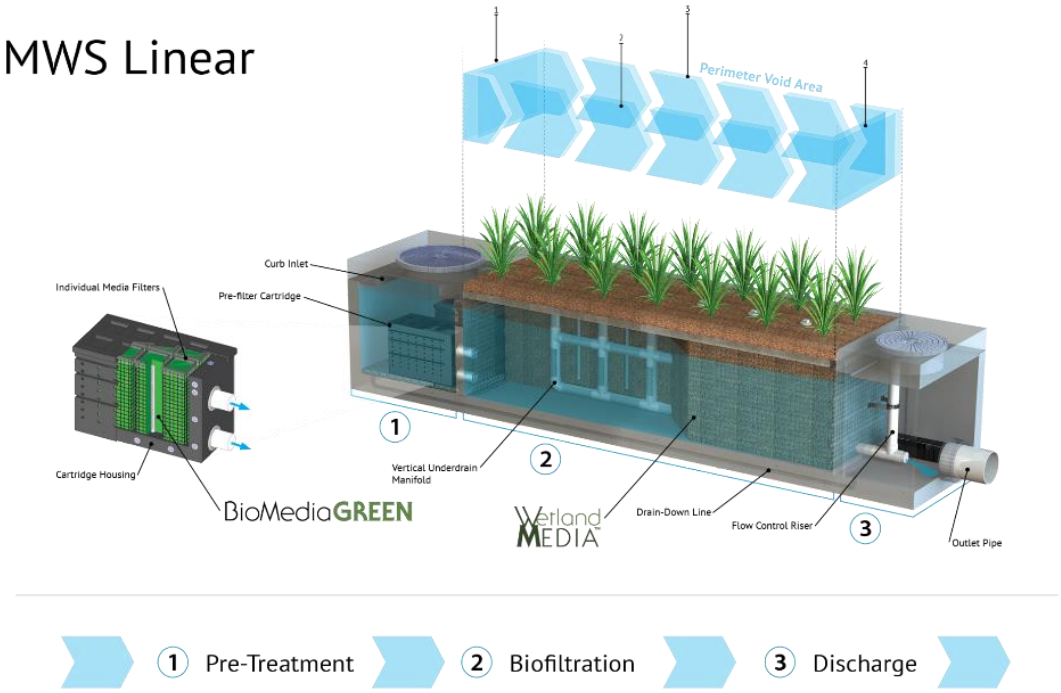
6. Biofiltration BMPs must be designed to prevent erosion, scour, and channeling within the BMP.

    a. The MWS Linear is a self-contained system with a pre-treatment chamber. Unlike other biofiltration BMPs erosion, scour, and channeling with in the BMP is not an issue. Following is a diagram of the BMP. The system pre-treatment chamber prevent any erosion or scour. The system downstream orifice control prevents channeling of the media:



7. Biofiltration BMP must include operations and maintenance design features and planning considerations to provide for continued effectiveness of pollutant and flow control functions.

    a. The MWS Linear provides activation along with the first year of maintenance and inspection free on all installation in the county of San Diego. Unlike other biofiltration BMPs the City and Co-permitees can be assured the system is being properly installed and maintained. The first year of inspections is used the gauge the amount of loading in the system and this information is used to set appropriate maintenance interval for subsequent years. Attached is a copy of the maintenance manual for the MWS Linear.

Designed & Maintained Consistent with their Performance Certifications

We are in agreement that all BMPs should be designed in a manner consistent with the TAPE certification. The MWS Linear is sized in accordance with the TAPE GULD approval which provides certification at a loading rate of 1 gpm/sq ft (100 in/hr) for Basic, Phosphorus and Enhanced treatment. In addition, as stated previously, Modular Wetland System, Inc. provide activation of all system installed in San Diego County along with the first year of inspections and maintenance to ensure appropriate function. As previously stated, a copy of the TAPE GULD approval is attached to support this claim.

Additionally, it should be noted that the manual allows for biofiltration BMPs to be sized in either volume based (DCV) or flow based design. The manual states in section F.2.2 Sizing of Flow-Based Biofiltration *BMPs:*

> *"This sizing method is only available when the BMP meets the pollutant treatment performance standard in Appendix F.1."*
>
> *"Proprietary biofiltration BMPs are typically designed as a flow-based BMPs (i.e., a constant treatment capacity with negligible storage volume). Additionally, proprietary biofiltration is only acceptable if no infiltration is feasible and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible. The applicable sizing method for biofiltration is therefore reduced to: Treat 1.5 times the DCV."*
>
> *"The following steps should be followed to demonstrate that the system is sized to treat 1.5 times the DCV."*
>
> > *1. Calculate the flow rate required to meet the pollutant treatment performance standard without scaling for the 1.5 factor. Options include either:*
> >
> > - *Calculate the runoff flow rate from a 0.2 inch per hour uniform intensity precipitation event (See methodology Appendix B.6.3), or*
> >
> > - *Conduct a continuous simulation analysis to compute the size required to capture and treat 80 percent of average annual runoff; for small catchments, 5-minute precipitation data should be used to account for short time of concentration. Nearest rain gage with 5-minute precipitation data is allowed for this analysis.*

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2. Multiply the flow rate from Step 1 by 1.5 to compute the design flow rate for the biofiltration system.

3. Based on the conditions of certification/verification (discussed above), establish the design capacity, as a flow rate, of a given sized unit.

4. Demonstrates that an appropriate unit size and number of units is provided to provide a flow rate that meets the required flow rate from Step 2.

In conclusion, we have closely followed the process and protocol for showing the MWS Linear meets all the criteria to be accepted as Biofiltration as found in Appendix F.

If you have any questions please feel free to contact us directly.

Sincerely,

Sean M. Hasan

Manager San Diego/Riverside, CA

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WASHINGTON STATE DEPARTMENT OF ECOLOGY

November 2022

GENERAL USE LEVEL DESIGNATION FOR BASIC (TSS) ENHANCED AND PHOSPHORUS TREATMENT

For

Contech Engineered Solutions, LLC (Contech) Modular Wetlands Linear

Ecology's Decision

Based on Modular Wetland Systems, Inc, application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General Use Level Designation (GULD) for the Modular Wetlands Linear Stormwater Treatment System for Basic, Phosphorus, and Enhanced treatment
    - Sized at a hydraulic loading rate of:
        - 1 gallon per minute (gpm) per square foot (sq ft) of Wetland Cell Surface Area
        - Prefilter box (approved at either 22 inches or 33 inches tall)
            - 3.0 gpm/sq ft of prefilter box surface area for moderate pollutant loading rates (low to medium density residential basins).
            - 2.1 gpm/sq ft of prefilter box surface area for high pollutant loading rates (commercial and industrial basins).
2. Ecology approves the Modular Wetlands Linear Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:
    - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute water quality treatment design flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology- approved continuous runoff model.

- Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute water quality treatment design flow rate as calculated using one of the three methods described in Chapter 2.7.6 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
- Entire State: For treatment installed downstream of detention, the water quality treatment design flow rate is the full 2-year release rate of the detention facility.

3. These use level designations have no expiration date but may be amended or revoked by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use

Applicants shall comply with the following conditions:

1) Design, assemble, install, operate, and maintain the Modular Wetlands Linear Stormwater Treatment System units, in accordance with Contech's. applicable manuals and documents and the Ecology Decision.
2) Each site plan must undergo Contech review and approval before site installation. This ensures that site grading and slope are appropriate for use of a Modular Wetlands Linear Stormwater Treatment System unit.
3) Modular Wetlands Linear Stormwater Treatment System media shall conform to the specifications submitted to and approved by Ecology.
4) The applicant tested the Modular Wetlands Linear Stormwater Treatment System with an external bypass weir. This weir limited the depth of water flowing through the media, and therefore the active treatment area, to below the root zone of the plants. This GULD applies to Modular Wetlands Linear Stormwater Treatment Systems whether plants are included in the final product or not.
5) Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of stormwater treatment technology.
    - Typically, Contech designs Modular Wetland systems for a target prefilter media life of 6 to 12 months.
    - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
    - Owners/operators must inspect Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to the SWMMEW, the wet

season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
  - Standing water remains in the vault between rain events, or
  - Bypass occurs during storms smaller than the design storm.
  - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
  - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6) Discharges from the Modular Wetlands Linear Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant:	Contech Engineered Solutions, LLC
Applicant's Address:	11815 NE Glenn Widing Dr. Portland, OR 97220

Application Documents:

Original Application for Conditional Use Level Designation, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011

Quality Assurance Project Plan: Modular Wetland System – Linear Treatment System Performance Monitoring Project, draft, January 2011

Revised Application for Conditional Use Level Designation, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011

Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data, April 2014

Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring, April 2014

Applicant's Use Level Request:

- General Use Level Designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The Modular Wetlands Linear is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/L.
- The Modular Wetlands Linear is capable of removing a minimum of 50-percent of total phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/L.
- The Modular Wetlands Linear is capable of removing a minimum 30-percent of dissolved copper from stormwater with influent concentrations between 0.005 and 0.020 mg/L.
- The Modular Wetlands Linear is capable of removing a minimum 60-percent of dissolved zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/L.

Ecology's Recommendations:

- Contech has shown Ecology, through laboratory and field-testing, that the Modular Wetlands Linear Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Phosphorus, and Enhanced treatment goals.

Findings of Fact:

<u>Laboratory Testing</u>

The Modular Wetlands Linear Stormwater Treatment System has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.

- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Field Testing

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).
- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Contech should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Contech should use these data to establish required maintenance cycles.
2. Contech should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Contech will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:

Download at https://www.conteches.com/modular-wetlands

Contact Information:

Applicant: Jeremiah Lehman
Contech Engineered Solutions, LLC
11815 NE Glenn Widing Dr.
Portland, OR 97220
Jeremiah.Lehman@ContechES.com

Applicant website: http://www.conteches.com

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 870-0983
douglas.howie@ecy.wa.gov

Revision History

Date	Revision
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment
December 2015	Updated GULD to document the acceptance of MWS – Linear Modular Wetland installations with or without the inclusion of plants
July 2017	Revised Manufacturer Contact Information (name, address, and email)
December 2019	Revised Manufacturer Contact Address
July 2021	Added additional prefilter sized at 33 inches
August 2021	Changed “Prefilter” to “Prefilter box”
November 2022	Changed Contacts to Contech ES

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.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
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, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☑ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☑ Not required because BMPs will drain in less than 96 hours

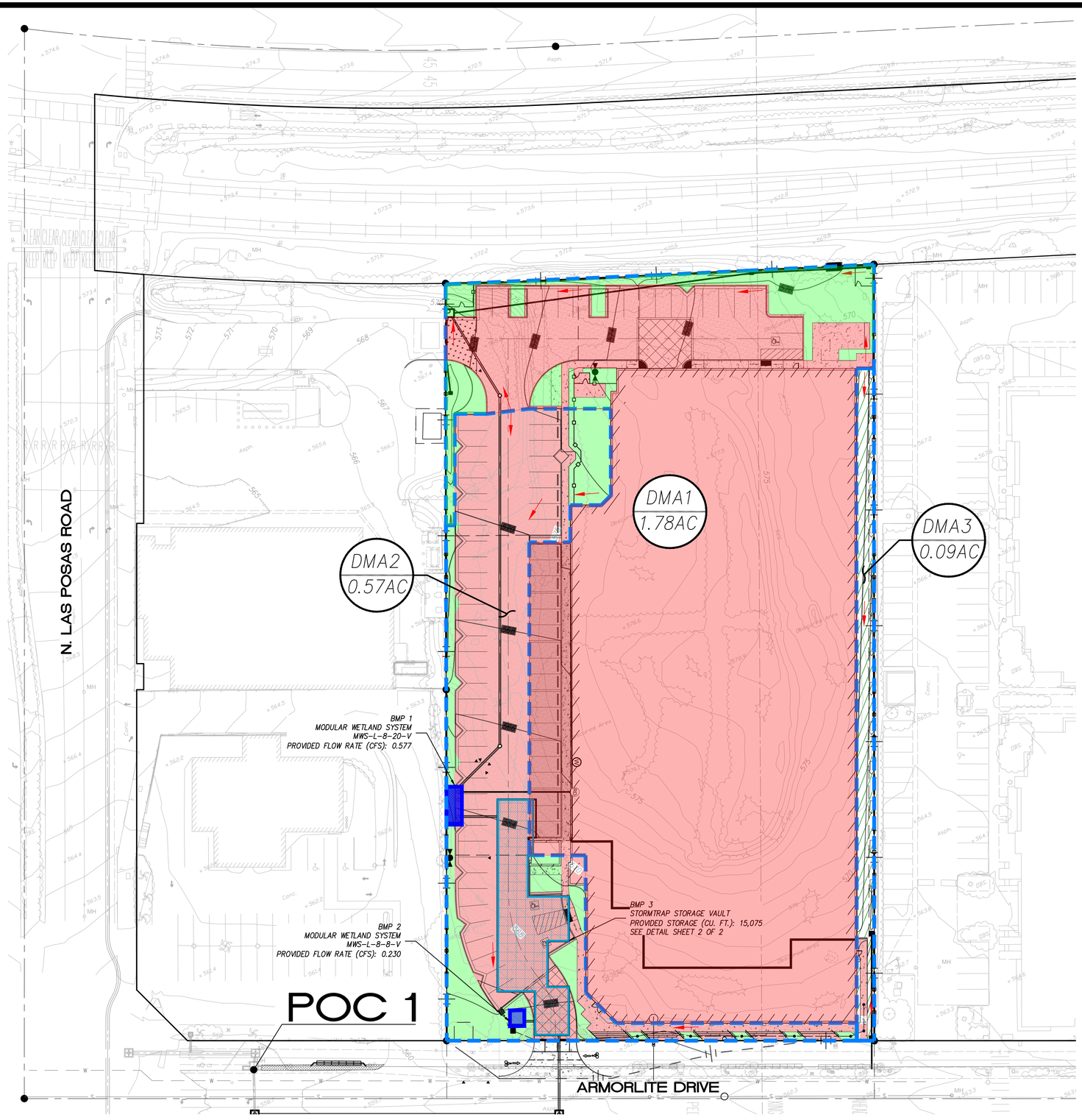
Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

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
- ☑ 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)

ATTACHMENT 2a

HYDROMODIFICATION MANAGEMENT EXHIBITS



LEGEND

- PROPOSED FLOW PATH
- DMA BOUNDARY
- 250 PROPOSED CONTOUR
- IMPERVIOUS PAVEMENT
- PERVIOUS LANDSCAPE

DMA SUMMARY TABLE

NAME	AREA (SF)	SOIL TYPE	POST PROJECT SURFACE
1	71,715	C	IMPERVIOUS AREA
	5,780	C	PERVIOUS AREA
2	19,360	C	IMPERVIOUS AREA
	5,400	C	PERVIOUS AREA
TOTAL AREA	107,680	TREATED BY	MECHANICALLY TREATED BMP'S
3	3,825	C	SELF-MITIGATING PERVIOUS AREA

*** HMP CONTROL BY BMP 3: STORMWATER DETENTION SYSTEM**

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: PROPOSED DRAINAGE CAPTURES POST DEVELOPMENT DRAINAGE ONSITE AND IS CONVEYED VIA PRIVATE STORM DRAIN SYSTEMS BEFORE DISCHARGING INTO THE EXISTING STORM DRAIN SYSTEM ON ARMORLITE DRIVE. SELF-MITIGATING PERVIOUS AREA FROM DMA 3 FOLLOWS EXISTING DRAINAGE PATTERNS AND SHEETFLOW OFF-SITE RESPECTIVELY.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON. SEE FORM I-5 FOR EXPLANATION.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLES.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE FORMS 1-3B AND 1-4 FOR EXPLANATION.

STRUCTURAL BMPS: SHOWN HEREON. SEE DETAILS.

EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: SOIL CLASS TYPE "C"

GROUNDWATER: FREE GROUNDWATER WAS NOT ENCOUNTERED IN THE EXPLORATORY BORINGS PER REPORT BY ALTA CALIFORNIA GEOTECHNICAL, INC., ENTITLED "PRELIMINARY GEOTECHNICAL INVESTIGATION, LOS POSAS ROAD AND ARMORLITE DRIVE CITY OF SAN MARCOS, CALIFORNIA" DATED MARCH 31, 2021 (1-0371). GROUND WATER LEVELS ARE ANTICIPATED TO BE GREATER THAN 100 FEET BELOW THE GROUND SURFACE.

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: **THIS SITE IS NOT LOCATED WITHIN A CCSYA, SEE CCSYA EXHIBIT IN ATTACHMENT 2.**

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON.

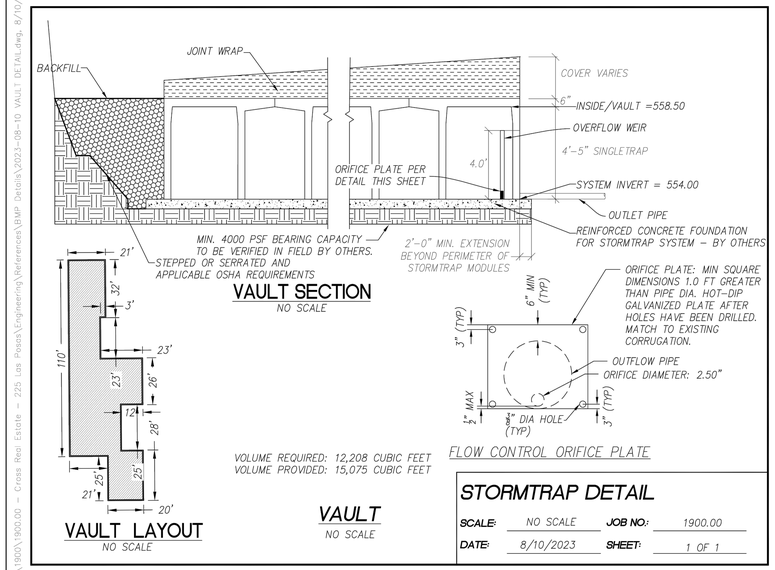
EXISTING DRAINAGE: THE EXISTING SITE IS UNDEVELOPED AND IS COMPLETELY SELF-MITIGATING PERVIOUS AREA.

HMP EXHIBIT
ARMORLITE LOFTS
ATTACHMENT 2A

SCALE: 1"=30'
DATE: 2023-08-10
SHEET NO: 1 OF 2
PREPARED BY: DN

latitude33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

H:\1900\1900.00 - CROSS REAL ESTATE - 225 LAS POSAS\ENGINEERING\REPORTS\WATER QUALITY\ATTACHMENT 2 - HMP BACKUP\ATTACH. 2A - HMP EXHIBIT\1900.00_HMP EXHIBIT.DWG 10/22/2024 5:13 PM



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BMP 3: STORMTRAP STORAGE VAULT

NOT TO SCALE

SITE DESIGN, SOURCE CONTROL AND POLLUTANT CONTROL BMP OPERATION + MAINTENANCE PROCEDURE

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: XXXXXX

O&M RESPONSIBLE PARTY DESIGNEE: (PROPERTY OWNER) / HOA / CITY / OTHER:

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	INCLUDED IN O&M MANUAL		SHEET NUMBER(S)
SITE DESIGN ELEMENTS							
SITE DESIGN 4.3.3, SITE DESIGN 4.3.4, SITE DESIGN 4.3.7, AMENDED SOIL	AS-NEEDED AND BEFORE AND AFTER RAIN EVENTS	AS-NEEDED AND BEFORE AND AFTER RAIN EVENTS	INSPECT AND MAKE CORRECTIVE ACTIONS AS NECESSARY TO MAINTAIN NATURAL DRAINAGE PATHWAYS, HYDROLOGIC FEATURES, NATURAL FEATURES INCLUDING TREES, VEGETATION, AND SOILS. MINIMIZE SOIL COMPACTION IN NON-HARDSCAPE AREAS BY LIMITING DISTURBANCE AND TILLING OF SOIL TO ALLOW FOR BETTER INFILTRATION. ENSURE THAT IMPERVIOUS AREAS DRAIN TO PERVIOUS AREAS.	-	YES	NO	XXXXX
SOURCE CONTROL ELEMENTS							
SC-D	PERIODICALLY	PERIODICALLY	PLAZAS, SIDEWALKS, AND PARKING LOTS SHALL BE SWEPT TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS. DEBRIS FROM PRESSURE WASHING SHALL BE COLLECTED TO PREVENT ENTRY TO STORM DRAIN SYSTEM. WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER SHALL BE COLLECTED AND DISCHARGED TO THE SANITARY SEWER AND NOT DISCHARGED TO A STORM DRAIN.	-	YES	NO	XXXXX
SC-E	WEEKLY, MONTHLY & AS-NEEDED	WEEKLY, MONTHLY & AS-NEEDED	MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES. SEE APPLICABLE OPERATIONAL BMPS IN FACT SHEET SC-41, "BUILDING AND GROUNDS MAINTENANCE," IN THE CASQA STORMWATER QUALITY HANDBOOKS AT WWW.CABMPHANDBOOKS.COM. PROVIDE IPM INFORMATION TO NEW OWNERS, LESSEES AND OPERATORS.	-	YES	NO	XXXXX
SC-F	AS-NEEDED	AS-NEEDED	MAINTAIN AND PERIODICALLY REPAINT OR REPLACE INLET MARKINGS. PROVIDE STORM WATER POLLUTION PREVENTION INFORMATION TO NEW SITE OWNERS, LESSEES, OR OPERATORS. SEE APPLICABLE OPERATIONAL BMPS IN FACT SHEET SC-44, "DRAINAGE SYSTEM MAINTENANCE," IN THE CASQA STORMWATER QUALITY HANDBOOKS AT WWW.CABMPHANDBOOKS.COM. INCLUDE THE FOLLOWING IN THE LEASE AGREEMENTS: "TENANTS SHALL NOT ALLOW ANYONE TO DISCHARGE ANYTHING TO THE STORM DRAINS OR TO STORE OR DEPOSIT MATERIALS SO AS TO CREATE A POTENTIAL DISCHARGE TO STORM DRAINS."	-	YES	NO	XXXXX
POLLUTANT CONTROL BMP(S)							
MODULAR WETLANDS SYSTEM	EVERY 6-12 MONTHS	EVERY 12-24 MONTHS	TASKS INCLUDE TRASH REMOVAL FROM SCREENING DEVICE AND SEDIMENT REMOVAL FROM SEPARATION CHAMBER. REPLACE CARTRIDGE FILTER MEDIA AND DRAIN DOWN FILTER MEDIA. INSPECT AND VACUUM IF NECESSARY.	2	YES	NO	XXXXX
HMP FACILITY (IF SEPARATE)	EVERY 6	EVERY 6					
STORMTRAP STORAGE VAULT	MONTHS	MONTHS	INSPECT AND VACUUM IF NECESSARY	1	YES	NO	XXXXX

HMP EXHIBIT
ARMORLITE LOFTS
ATTACHMENT 2A

SCALE: 1"=30'
DATE: 2023-08-10
SHEET NO: 2 OF 2
PREPARED BY: DN

latitude33
PLANNING & ENGINEERING
9665 Hibert Street, 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

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ATTACHMENT 2b

MANAGEMENT OF CRITICAL COARSE SEDIMENT YIELD AREAS

CCSYA EXHIBIT

225 N LAS POSAS, SAN MARCOS

0 250 500 1000 1500

(IN FEET)

1 inch = 500 ft.

POTENTIAL COURSE SEDIMENT YIELD AREAS

H:\1900\1900.00 - CROSS REAL ESTATE - 225 LAS POSAS\ENGINEERING\REPORTS\WATER QUALITY\ATTACHMENT 2 - HMP BACKUP\ATTACH. 2B - CCSYA

ATTACHMENT 2c

GEOMORPHIC ASSESSMENT OF RECEIVING CHANNELS

Prepared by Delane Engineering

CHANNEL SCREENING ANALYSIS

KARL STRAUSS SAN MARCOS TASTING ROOM AND GARDEN

ARMORLITE DR.
SAN MARCOS, CA 92069

ASSESSOR'S PARCEL NUMBER(S):
219-163-60

ENGINEER OF WORK:

BRIAN P. WIESE, P.E., LICENSE # C80674
EXPIRATION DATE: 03/31/2021

PREPARED FOR:

Karl Strauss Brewing Co.
5965 Santa Fe Street, Suite E
San Diego, CA 92109

PREPARED BY:

Delane Engineering, Inc.
4909 Murphy Canyon Road, Suite 330
San Diego, CA 92123
619-535-0602

DATE:
November 18, 2019

DELANE ENGINEERING

TABLE OF CONTENTS:

ATTACHMENTS:

CIVIL ENGINEERING | STORMWATER | DESIGN BUILD

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4909 Murphy Canyon Road, STE 330, San Diego, CA 92123 | P. 619.787.5566 | F. 866.579.6415

1.0 Introduction

A new brewery with tasting room, garden, food truck staging areas, and an associated parking lot is being proposed by Karl Strauss Brewing Company on a 1.51 acre site at Los Posas Road and Los Vallecitos Blvd in the City of San Marcos. Runoff from the site is discharged via lateral into an existing 72" pipe recently constructed as part of the adjacent Palomar Station development. The 72" pipe is part of the public storm drain system that flows in a generally southerly direction before discharging into a vegetated channel, referred to herein as Los Posas Creek. See **Attachment A** for vicinity map showing project site in relation to Los Posas Creek.

The project is subject to hydromodification requirements as described in Chapter 6 of the City of San Marcos BMP Design Manual, the purpose of which is to minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters. To meet this requirement the project must provide flow control for post-project runoff to meet the flow control performance standard. The flow control performance standard covers flow rates ranging from a lower flow threshold of 10 percent, 30 percent or 50 percent of the pre-development 2-year runoff event ($0.1Q_2$, $0.3Q_2$, or $0.5Q_2$) up to the pre-development 10-year runoff event (Q10). The determination of the low flow threshold depends on the erosion susceptibility of the receiving stream with $0.1Q_2$ for projects discharging to streams with high susceptibility to erosion (also the default when a channel susceptibility study has not been prepared), $0.3Q_2$ for projects discharging to streams with medium susceptibility to erosion, and $0.5Q_2$ for projects discharging to streams with low susceptibility to erosion

As described in section 6.3.4 of the San Marcos BMP Manual, the use of a higher low flow threshold of $0.3Q_2$ or $0.5Q_2$ must be supported by a channel screening report based on a tool developed by the Southern California Coastal Water Research Project (SCCWRP), documented in SCCWRP's Technical Report 606 (TR 606), dated March 2010, "Hydromodification Screening Tools: Field Manual for Assessing Channel Susceptibility." This study follows the methodology of the SCCWRP in order to determine the susceptibility of Los Posas Creek, the results of which can be used to establish the required flow control sizing for the project.

2.0 Office Assessment

Although the screening tool presented in TR 606 is predominantly designed for field-based assessment, it requires some preparatory office work to provide context and familiarity with the site prior to conducting the field evaluation. A satellite image is provided in **Attachment A** which shows features of the overall setting such as vegetation coverage, grade-control locations, human influences, and existing infrastructure.

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The office assessment also requires an initial desktop analysis, the results of which are provided on Form 1 in **Attachment C**. Inputs for the drainage area and mean annual precipitation where determined from StreamStats, a Web-based GIS application that provides users access to USGS Data (StreamStats report provided in **Attachment C**). The valley width and valley slope were determined from City of San Marcos bare earth elevation contour information (2-ft) from 2009.

3.0 Analysis Domain

As defined in the San Marcos BMP Manual, the receiving stream is the location where runoff from the project is discharged to natural or un-lined channels. This occurs at the outfall of Los Posas Creek from a triple box culvert on the west side of Los Posas Road, approximately 500ft south of the intersection of Linda Vista Drive. This is the upstream limit of analysis as it is where the open, unlined channel begins (*Photos 1, 2*).

Per criteria in TR 606, the downstream extent of analysis is determined to be the closest of the following:

- At least one reach downstream of the first grade-control point
- Tidal backwater/lentic waterbody
- Equal order tributary
- A 2-fold increase in drainage area

The nearest lentic waterbody is Lake San Marcos, approximately 5,000 ft downstream and an equal order tributary/2-fold increase in drainage area does not occur until the confluence with San Marcos Creek approximately 2,000 ft downstream. The first grade control point is approximately 400 ft downstream where a small channel discharges from the east and the main channel shows distinct changes, in particular to bank slope. Although analysis is only required for one reach downstream of this location, the downstream extent selected was the crossing beneath San Marcos Boulevard (*Photo 14*) as this is a logical divide which may offer grade control, cause discontinuities in the conveyance of water or sediment, etc.

Although the 1,200 ft analysis domain is longer than the 656 feet (200m) maximum reach length for assigning a susceptibility rating per TR 606, this section of Los Posas Creek is an engineered channel which aerial photos and field reconnaissance show to be relatively uniform. Dividing the analysis domain into additional subreaches will not produce significantly different results.

4.0 Field Screening

A field assessment of the analysis domain was done on November 8, 2019. Much of the study area contained dense vegetation (*Photos 2, 11*) which limited access to some areas of the channel. The areas of the channel that were accessible for assessment were typically moderately vegetated (*Photo 12*). Evaluating just these

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areas errs conservative as additional vegetation helps hold soil together and reduces flow velocity, further reducing susceptibility to erosion. Aerial photographs of the area dating back over 20 years show that vegetation coverage along the channel has increased with time.

The field screening tool uses a combination of relatively simple, but quantitative field indicators as input parameters to a set of decision trees. These decision trees, along with checklists, tables and calculations, follow a logical progression for assigning a susceptibility rating of Low, Medium, High, or Very High to the channel reach being assessed. susceptibility ratings are assigned independently to the vertical and lateral conditions, the more conservative of which is used to determine the erosion susceptibility of the channel. Vertical stability is a prerequisite for lateral stability because a stream that incises can increase bank heights to the point of collapse and channel widening. Accordingly, vertical susceptibility is assessed first because it affects the lateral rating in most instances.

Vertical Susceptibility

The decision tree and associated checklists and calculations for determining a vertical susceptibility rating (Form 3 from TR 606) are in **Attachment D**. The purpose of the vertical susceptibility decision tree is to assess the state of the channel bed with a particular focus on the risk of incision. There are three potential states of bed material based on broad classes of armoring potential, described in TR 606 as follows:

- *Labile Bed* – sand-dominated bed, little resistant substrate
- *Transitional/Intermediate Bed* – bed typically characterized by gravel/small cobble, intermediate level of resistance of the substrate and uncertain potential for armoring
- *Threshold Bed (Course/Armored Bed)* – armored with large cobbles or larger bed material or highly-resistant bed substrate

The decision tree includes a photographic supplement to help make the determination of bed material. Through field observation it was determined that the bed was not sand-dominated nor sufficiently armored. Although the channel is not consistently armored, some larger cobble was observed along the banks adjacent to the initial discharge location into the channel (*Photos 3, 4*). Concrete armoring of the bed was observed upstream of the culvert crossing beneath San Marcos Blvd, at the downstream end of the analysis domain (*Photos 13, 14*). For the majority of the analysis domain, a surface veneer and dense vegetation cause uncertainty in the potential for armoring. Penetration of the soil was difficult and the limited substrate bed material that was able to be observed contained gravel (*Photo 5*), both of which are consistent with a Transitional/Intermediate Bed.

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Intermediate beds require the following additional risk factors to be examined before a vertical rating can be assigned.

- *Armoring Potential* – The channel was determined to have intermediate armoring potential based on Form 3 Checklist 1. This is a result of the unknown condition of the substrate due to surface veneer and vegetation.

- *Grade Control* – The channel was determined to have intermediate grade control based on Form 3 Checklist 2. Man-made grade control is present at each end of the analysis domain in the form of culverts. Both appear in good condition with no apparent undermining, flanking, etc. The dense vegetation between functions as a continuous natural grade control and the flat valley slope determined as part of the desktop analysis mean that grade control will have an affect across a longer distance. The determination of intermediate instead of effective grade control was made to err conservative due to potential evidence of erosion observed on a few short stretches of bank along the channel (*Photo 6*)

- *Proximity to incision/braiding threshold* – The channel was determined to have a screening index score of B per Form 3 Table 1 as the surface veneer and vegetation result in hardpan/d_{50} that is indeterminate.

The results of the additional risk factors were translated to numeric values and used as inputs into a formula for coming up with an overall vertical rating as shown at the end of Form 3. The vertical rating was determined to be 6, which falls into the range of MEDIUM VERTICAL SUSCEPTIBILITY.

Lateral Susceptibility

The decision tree for determining a lateral susceptibility rating (Form 4 from TR 606) is in **Attachment E**. The purpose of the lateral decision tree is to assess the state of the channel banks with a particular focus on the risk of widening. Although the channel is straight and linear, it is laterally adjustable due to lack of armoring. However, the field assessment found no evidence of lateral adjustments occurring.

The banks were found to be moderately to highly consolidated based on the criteria in TR 606. They are hard when dry with little evidence of crumbling and bank material stratification is not prevalent or contributing to failure. Although there was no evidence of extensive mass wasting occurring along the channel, TR 606 methodology requires that the probability of mass wasting bank failure be analyzed to determine whether the risk of bank failure is less than or greater than 10%.

This risk threshold determination was made using the Probability Mass Wasting diagram in **Attachment F** (Form 6 Figure 1 from TR 606). The inputs for bank angle and height were determined based on measurements taken in the field (*Photos 7-10*). Assessment was done in several locations along the analysis

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domain with generally consistent results, with the more conservative of the measurements being used as inputs. Even erring conservation, it was determined that the probability of mass wasting bank failure is less than 10%.

The vertical rating is medium and the VWI (Valley Width Index) was calculated to be greater than 2 during the initial desktop analysis. As a result, the channel was determined to have MEDIUM LATERAL SUSCEPTIBILITY.

5.0 Conclusion

The methodology in the SCCWRP's Technical Report 606 was used to analyze the section of Los Posas Creek from the initial discharge into an unlined channel west of Los Posas Road to the culvert crossing beneath San Marcos Blvd. Results of the analysis indicate that the channel has medium vertical and lateral susceptibility. As such, the Karl Straus San Marcos project should design flow control facilities based on a maximum low flow threshold of 0.3Q2 which is indicative of a receiving channel with MEDIUM SUSCEPTIBILITY to erosion.

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ATTACHMENT A

VICINITY MAP

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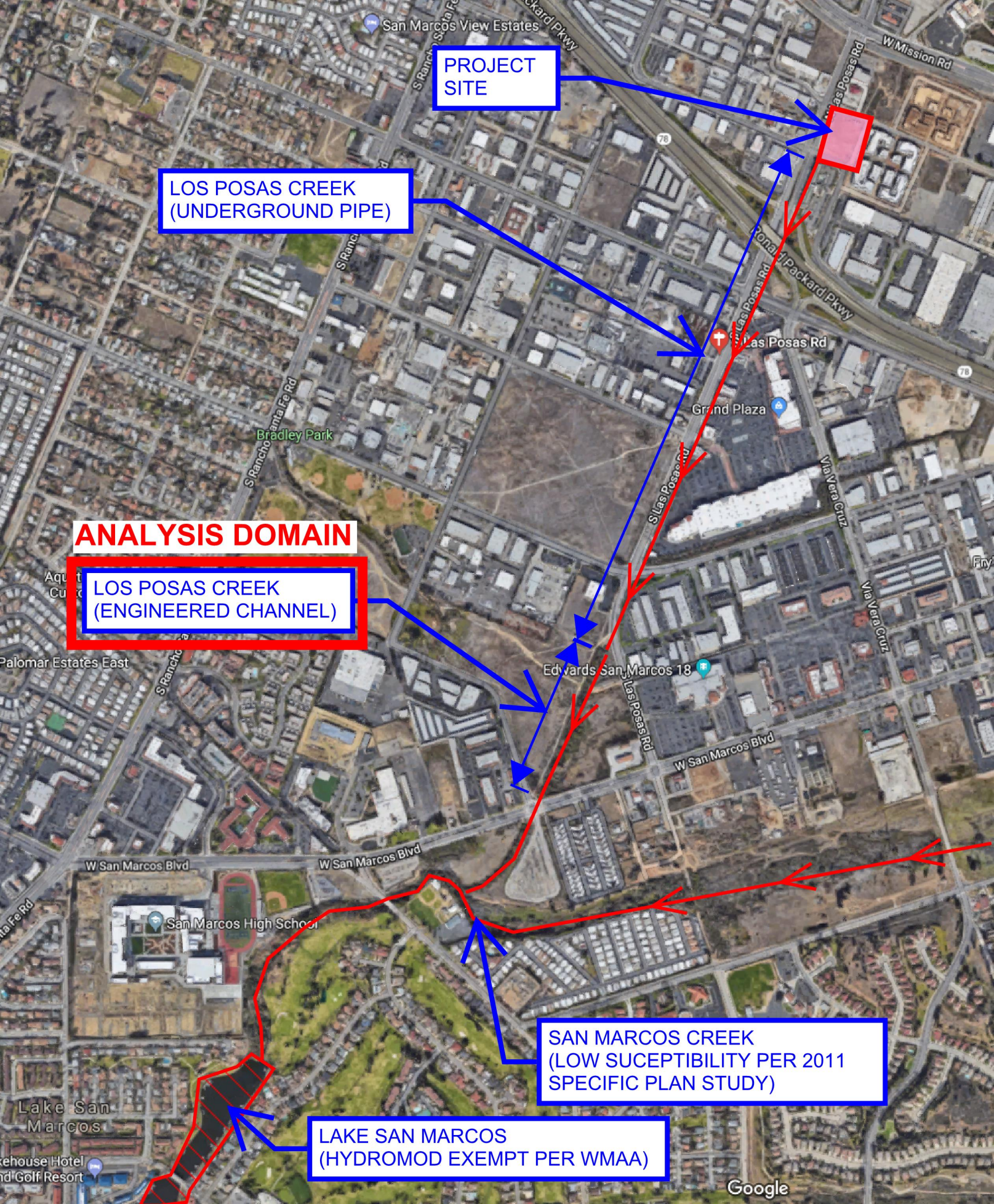
PROJECT SITE
LOS POSAS CREEK (UNDERGROUND PIPE)
ANALYSIS DOMAIN
LOS POSAS CREEK (ENGINEERED CHANNEL)
SAN MARCOS CREEK (LOW SUCEPTIBILITY PER 2011 SPECIFIC PLAN STUDY)
LAKE SAN MARCOS (HYDROMOD EXEMPT PER WMAA)
San Marcos View Estates
W Mission Rd
Las Posas Rd
Ronald Reagan Packard Pkwy
Grand Plaza
Bradley Park
S Rancho Santa Fe Rd
Via Vera Cruz
Palomar Estates East
Edwards San Marcos 18
W San Marcos Blvd
San Marcos High School
Lake San Marcos
Google

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ATTACHMENT B
FIELD ASSESSMENT PHOTOGRAPHS

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Photo 1: Looking upstream at beginning of analysis domain

Photo 2: Looking downstream from beginning of analysis domain

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Photo 3: Evidence of bank armoring at beginning of analysis domain

Photo 4: Evidence of bank armoring at beginning of analysis domain

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Photo 5: Channel bed material

Photo 6: Evidence of possible erosion

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Photo 7: Typical left bank slope

Photo 8: Typical left bank height

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Photo 9: Typical right bank slope

Photo 10: Typical right bank height

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Photo 11: Typical heavily vegetated section of channel

Photo 12: Typical moderately vegetated section of channel

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Photo 13: Armoring at downstream end of domain of analysis

Photo 14: Armoring at downstream end of domain of analysis

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ATTACHMENT C

FORM 1: INITIAL DESKTOP ANALYSIS

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S.CA Hydromodification Screening Tool version 1.0

user: Brian Wiese, PE

stream: **Karl Strauss San Marcos discharge location at Los Posas Creek**

latitude (decimal degrees): **33.1360**

longitude (decimal degrees): **-117.1951**

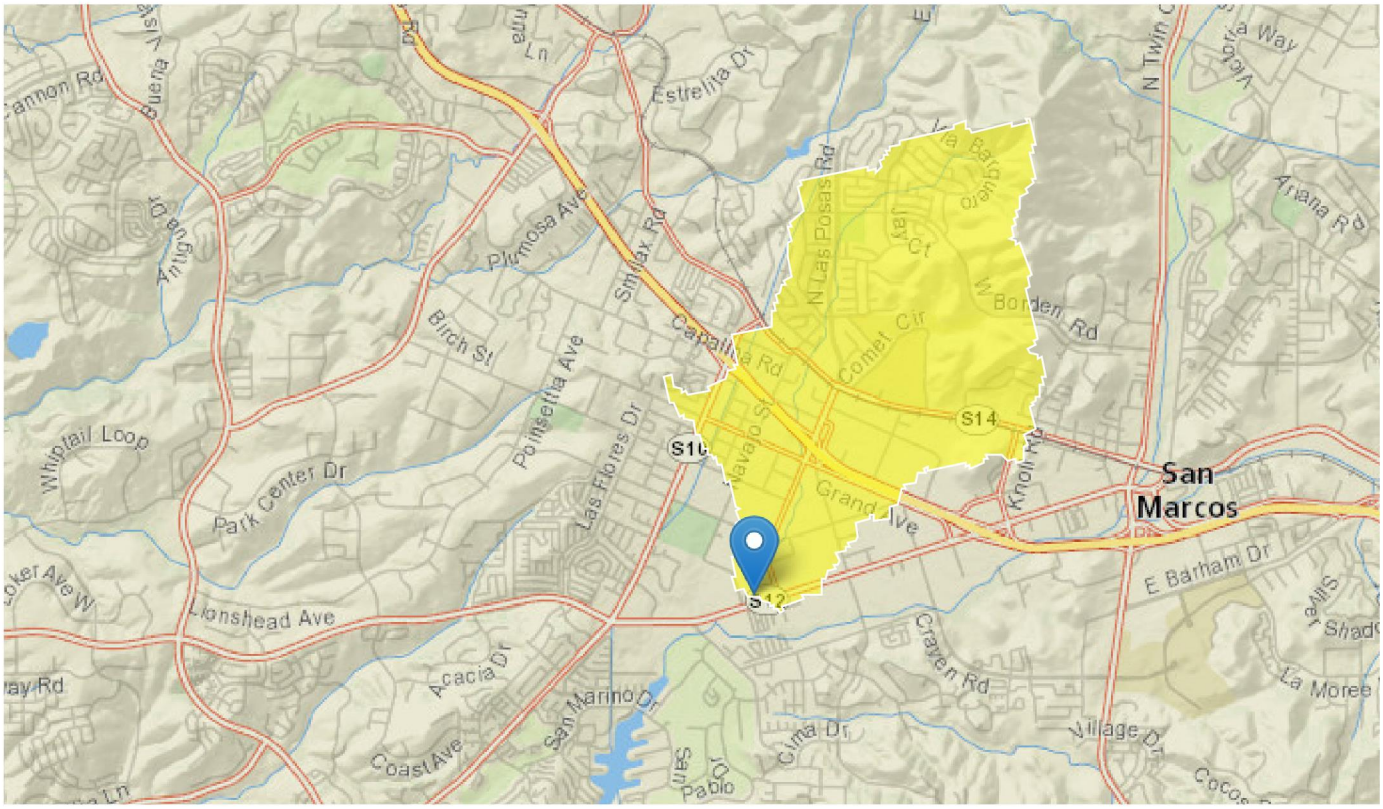
FORM 1: INITIAL DESKTOP ANALYSIS

GIS metrics and screening indices (for detailed instructions/examples see 'Field Screening Companion Document')

Symbol	Variable	units	Value	Description & Source
A	Drainage Area	mi^2	**2.6**	contributing drainage area to screening location via *published HUCs and/or 30-m (or better) National Elevation Data (NED), USGS seamless server*
P	Mean annual precipitation	inches	**15.8**	area-weighted annual precipitation via *USGS delineated polygons using records from 1900 to 1960 (which was more significant in hydrologic models than polygons delineated from shorter record lengths)*
S_v	Valley slope	m/m	**0.005**	valley slope at site *via NED, measured over a relatively homogeneous valley segment as indicated by slope, hillslope coupling/confinement, valley alignment, confluences, etc., over a distance of up to ~500 meters or 10% of the main-channel length (whatever is smaller)*
W_v	Valley width	meters	**127**	valley bottom width at site *between natural valley walls as dictated by clear breaks in hillslope on NED raster, irrespective of potential armoring from floodplain encroachement, levees, etc. (imprecise measurements have negligible effect on rating in wide valleys where VWI >>2, as defined in lateral decision tree)*
Q_{10cfs}	10-year peak flow, US units	ft^3/s	**350**	$Q_{10cfs} = 18.2 * A^{0.87} * P^{0.77}$ *(Hawley and Bledsoe, In review)*
Q_{10}	10-year peak flow	m^3/s	**9.90**	$Q_{10} = 0.0283 * Q_{10cfs}$
INDEX	10-year mobility index	$m^{1.5}/s^{0.5}$	**0.016**	$INDEX = S_v * Q_{10}^{0.5}$
W_{ref}	Reference width	meters	**19.08**	$W_{ref} = 6.99 * Q_{10}^{0.438}$
VWI	Valley width index	m/m	**6.65**	$VWI = W_v / W_{ref}$

039 Los Posas Creek StreamStats Report

Region ID: CA
Workspace ID: CA20191113182948989000
Clicked Point (Latitude, Longitude): 33.13324, -117.19614
Time: 2019-11-13 10:30:07 -0800



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM30M	Mean basin slope computed from 30 m DEM	8.79	percent
DRNAREA	Area that drains to a point on a stream	2.6	square miles
PRECIP	Mean Annual Precipitation	15.8	inches

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ATTACHMENT D

FORM 3: VERTICAL SUSCEPTIBILITY FIELD SHEET

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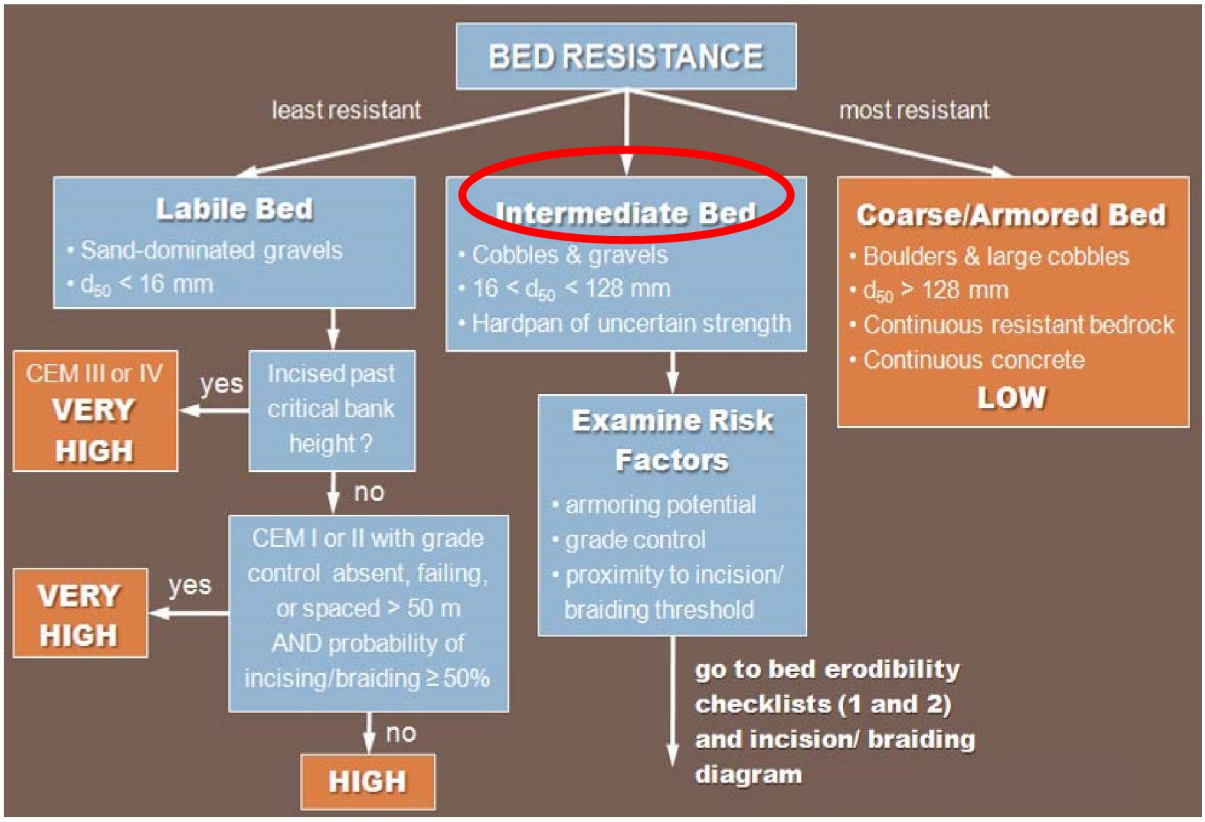
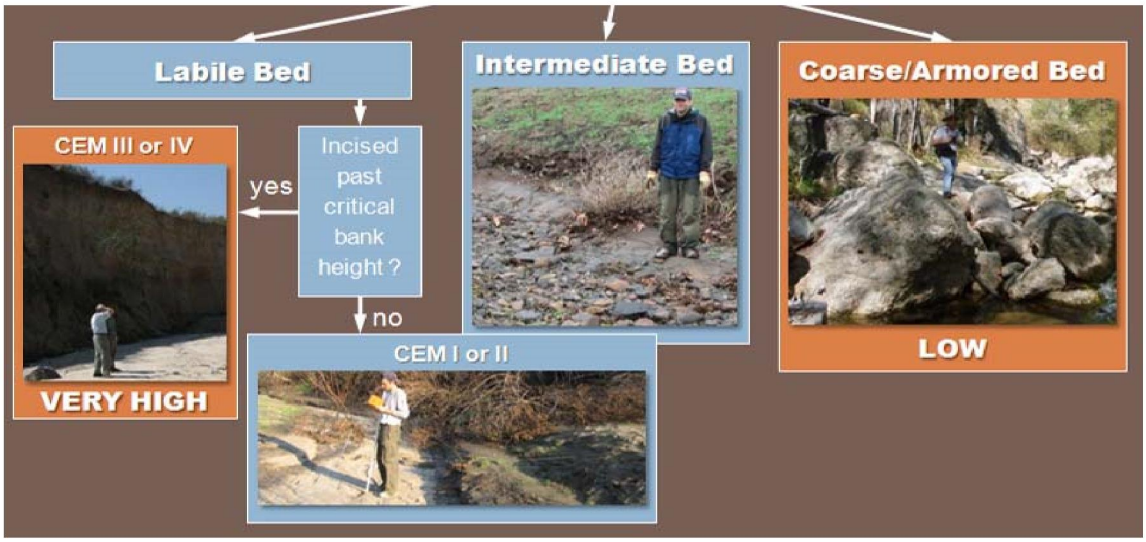
FORM 3: VERTICAL SUSCEPTIBILITY FIELD SHEET

Circle appropriate nodes/pathway for proposed site.





Form 3 Figure 1. Vertical Susceptibility photographic supplement to be used in conjunction with Form 3 Bed Resistance above.

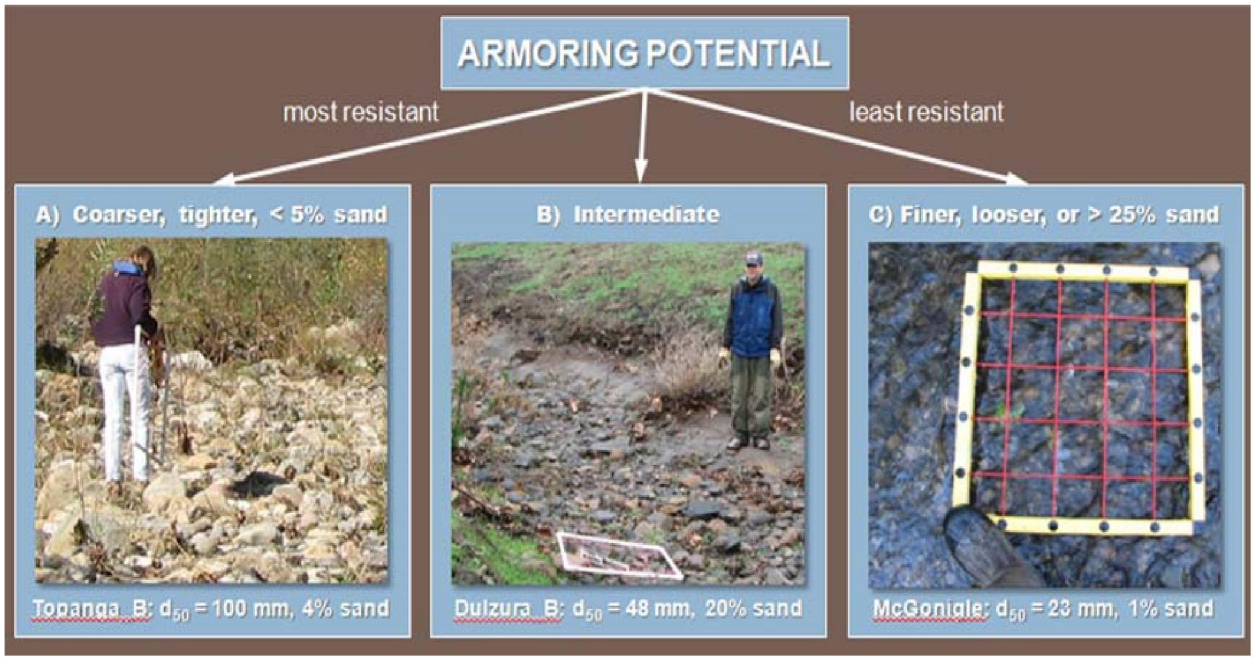
(Sheet 1 of 4)

Form 3 Support Materials

Form 3 Checklists 1 and 2, along with information recording in Form 3 Table 1, are intended to support the decisions pathways illustrated in Form 3 Overall Vertical Rating for Intermediate/Transitional Bed.

Form 3 Checklist 1: Armoring Potential

□	A	A mix of coarse gravels and cobbles that are tightly packed with <5% surface material of diameter <2 mm
X	B	Intermediate to A and C or hardpan of unknown resistance, spatial extent (longitudinal and depth), or unknown armoring potential due to surface veneer covering gravel or coarser layer encountered with probe
□	C	Gravels/cobbles that are loosely packed or >25% surface material of diameter <2 mm



Form 3 Figure 2. Armoring potential photographic supplement for assessing intermediate beds (16 < d_{50} < 128 mm) to be used i**n conjunction with Form 3 Checklist 1.**

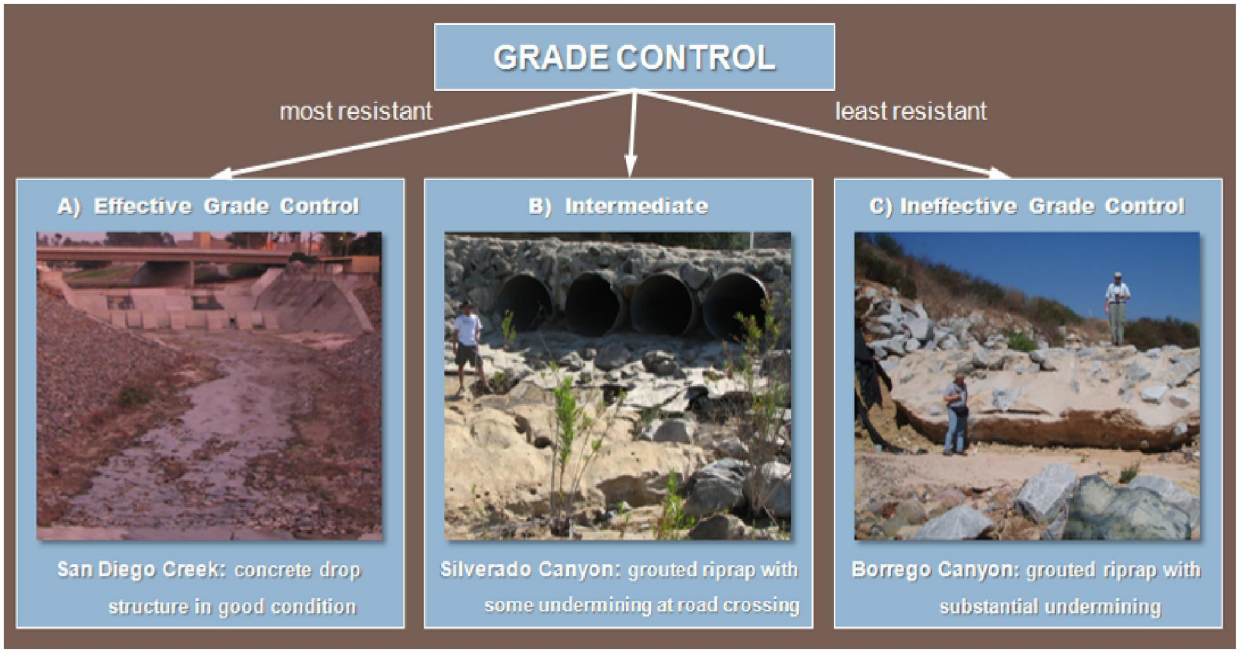
Form 3 Checklist 2: Grade Control

□ A Grade control is present with spacing <50 m or $2/S_v$ m

- No evidence of failure/ineffectiveness, e.g., no headcutting (>30 cm), no active mass wasting (analyst cannot say grade control sufficient if mass-wasting checklist indicates presence of bank failure), no exposed bridge pilings, no culverts/structures undermined
- Hard points in serviceable condition at decadal time scale, e.g., no apparent undermining, flanking, failing grout
- If geologic grade control, rock should be resistant igneous and/or metamorphic; For sedimentary/hardpan to be classified as 'grade control', it should be of demonstrable strength as indicated by field testing such as hammer test/borings and/or inspected by appropriate stakeholder

☒ B Intermediate to A and C – artificial or geologic grade control present but spaced 2/Sv m to 4/Sv m or potential evidence of failure or hardpan of uncertain resistance

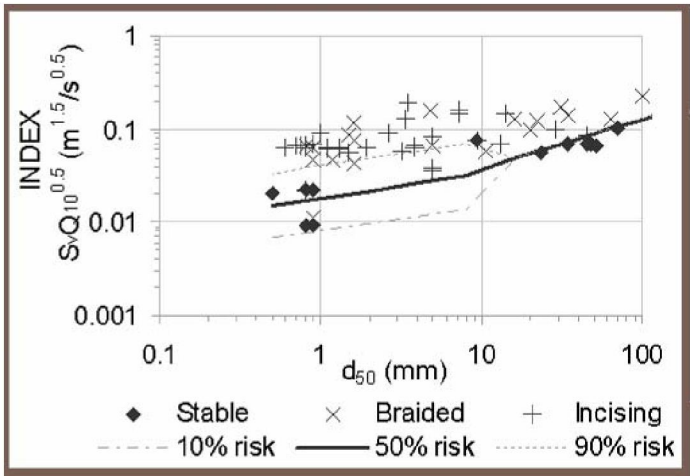
□ C Grade control absent, spaced >100 m or $>4/S_v$ m, or clear evidence of ineffectiveness



Form 3 Figure 3. Grade-control (condition) photographic supplement for assessing intermediate beds ($16 < d_{50} < 128$ mm) to be used in conjunction with Form 3 Checklist 2.

Regionally-Calibrated Screening Index Threshold for Incising/Braiding

For transitional bed channels (d_{50} between 16 and 128 mm) or labile beds (channel not incised past critical bank height), use Form 3 Figure 3 to determine Screening Index Score and complete Form 3 Table 1.



Model Type	d_{50} (mm)	50% Risk $S_vQ_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)
Logistic Regression $d_{50} \geq 16$ mm	128	0.145
	96	0.125
	80	0.114
	64	0.101
	48	0.087
	32	0.070
	16	0.049
Logistic Reg. $d_{50} < 16$ mm	8	0.031
	4	0.026
	2	0.022
	1	0.018
	0.5	0.015

Form 3 Figure 4. Probability of incising/braiding based on logistic regression of Screening Index and d_{50} to be used in conjunction with Form 3 Table 1.

Form 3 Table 1. Values for Screening Index Threshold (probability of incising/braiding) to be used in conjunction with Form 3 Figure 4 (above) to complete Form 3 Overall Vertical Rating for Intermediate/Transitional Bed (below).. Screening Index Score: A = <50% probability of incision for current Q_{10}, valley slope, and d_{50}; B = Hardpan/d_{50} indeterminate; and C = ≥50% probability of incising/braiding for current Q_{10}, valley slope, and d_{50}.

d_{50} (mm) *From Form 2*	**$S_v*Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)** *From Form 1*	**$S_v*Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)** *50% risk of incising/braiding from table in Form 3 Figure 3 above*	**Screening Index Score (A, B, C)**
	0.016	n/a (d50 indeterminate)	B

Overall Vertical Rating for Intermediate/Transitional Bed

Calculate the overall Vertical Rating for Transitional Bed channels using the formula below. Numeric values for responses to Form 3 Checklists and Table 1 as follows: A = 3, B = 6, C = 9.

B=6 B=6 B=6

$$Vertical\ Rating = \sqrt{\{(\sqrt{armoring} * grade\ control) * screening\ index\ score\}}$$

Vertical Susceptibility based on Vertical Rating: <4.5 = LOW; 4.5 to 7 = MEDIUM; and >7 = HIGH.

(Sheet 4 of 4)

Vertical Rating = $\sqrt{\sqrt{6 \times 6} \times 6} = 6$

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ATTACHMENT E

FORM 4: LATERAL SUSCEPTIBILITY FIELD SHEET

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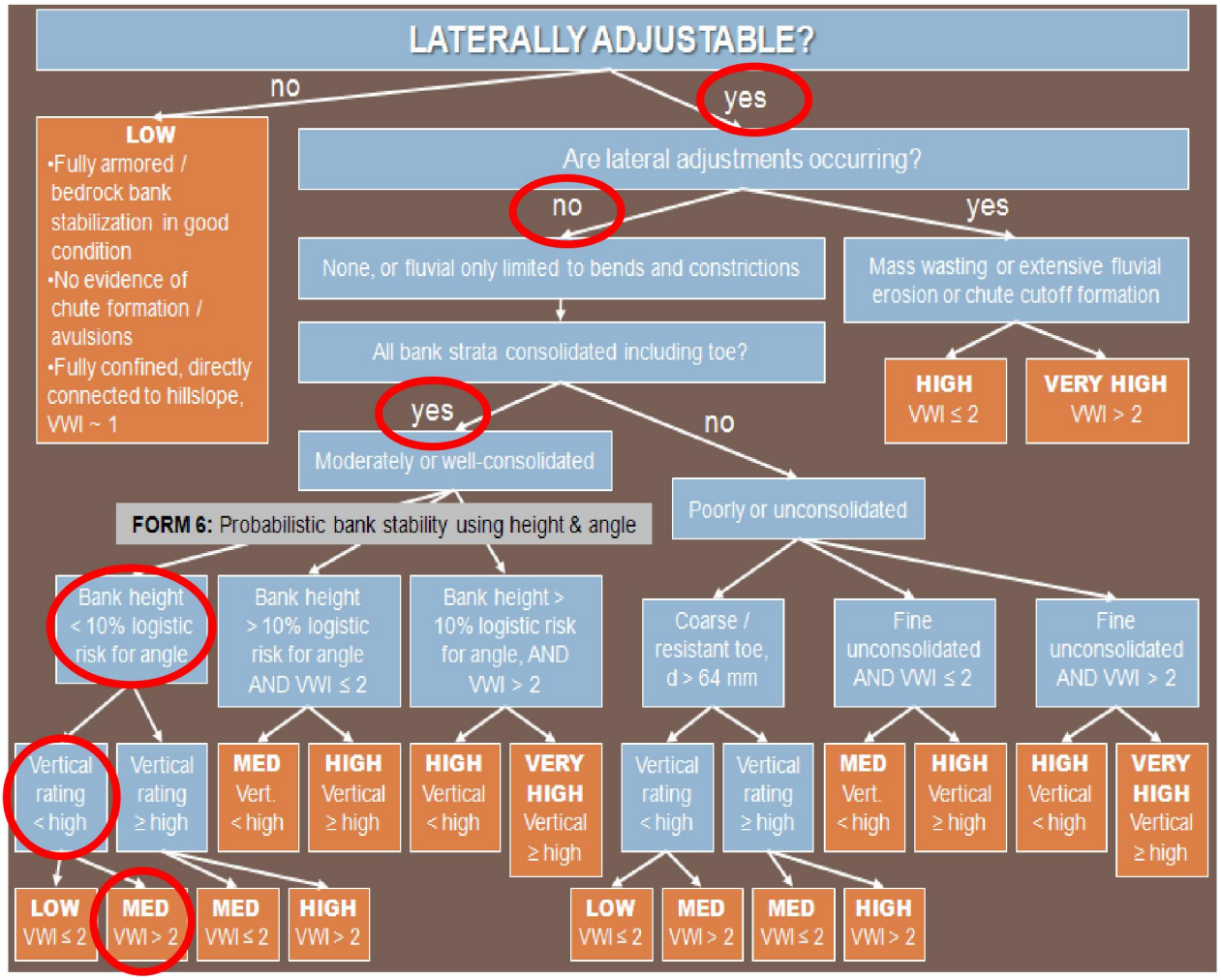
FORM 4: LATERAL SUSCEPTIBILTY FIELD SHEET

Circle appropriate nodes/pathway for proposed site
OR use sequence of questions provided in Form 5.



(Sheet 1 of 1)

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ATTACHMENT F

FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

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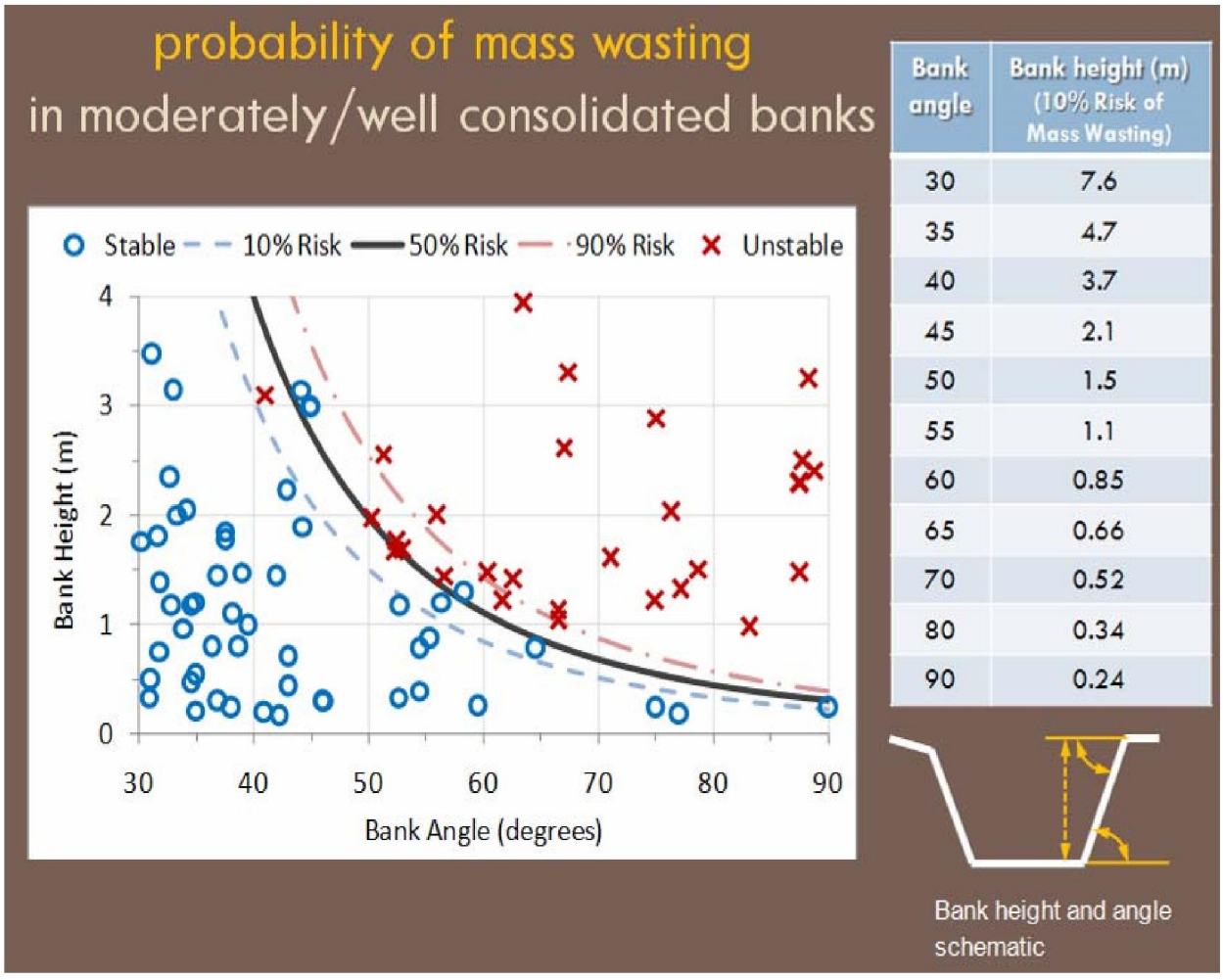
FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

If mass wasting is not currently extensive and the banks are moderately- to well-consolidated, measure bank height and angle at several locations (i.e., at least three locations that capture the range of conditions present in the study reach) to estimate representative values for the reach. Use Form 6 Figure 1 below to determine if risk of bank failure is >10% and complete Form 6 Table 1. Support your results with photographs that include a protractor/rod/tape/person for scale.

	Bank Angle (degrees) *(from Field)*	**Bank Height (m)** *(from Field)*	**Corresponding Bank Height for 10% Risk of Mass Wasting (m)** *(from Form 6 Figure 1 below)*	**Bank Failure Risk** *(<10% Risk)* *(>10% Risk)*
Left Bank	35 deg	< 1.5 m	4.7 m	< 10% Risk
Right Bank	25 deg	< 1.5 m	7.6 m	< 10% Risk



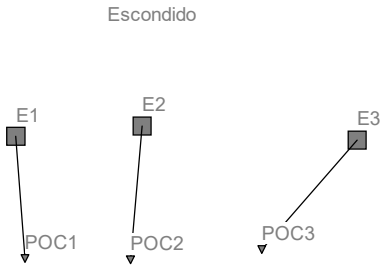
Form 6 Figure 1. Probability Mass Wasting diagram, Bank Angle:Height/% Risk table, and Band Height:Angle schematic.

(Sheet 1 of 1)

Attachment 2d
Flow Control Facility Design

Armorlite Drive - Pre-Project Continuous Simulation Model

09/24/1964 07:00:00



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.1)

1900 Armorlite Drive - Pre-Project Unmitigated

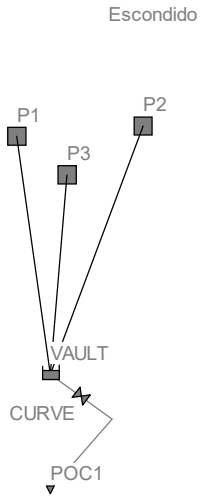
****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date 09/24/1964 06:00:00
Ending Date 05/23/2008 22:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 04:00:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	124.770	611.120
Evaporation Loss	5.222	25.576
Infiltration Loss	95.242	466.490
Surface Runoff	26.894	131.724
Final Storage	0.000	0.000
Continuity Error (%)	-2.073	

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	26.894	8.764
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	26.894	8.764
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000

```
  Final Stored Volume ......         0.000         0.000
  Continuity Error (%) .....         0.000


  **************************
  Subcatchment Runoff Summary
  **************************


-------------------------------------------------------------------------------------
-----------------------------------------
                            Total      Total      Total      Total     Imperv
Perv      Total       Total     Peak  Runoff
                          Precip      Runon       Evap      Infil     Runoff
Runoff     Runoff      Runoff   Runoff   Coeff
  Subcatchment                in         in         in         in         in
 in         in    10^6 gal      CFS

-------------------------------------------------------------------------------------
-----------------------------------------
  E1                        611.12       0.00      25.59     466.97       0.00
131.17     131.17        4.38     0.99   0.215
  E2                        611.12       0.00      25.53     464.77       0.00
133.71     133.71        2.61     0.58   0.219
  E3                        611.12       0.00      25.60     467.80       0.00
130.23     130.23        1.77     0.40   0.213


  Analysis begun on:  Mon Aug  7 19:48:52 2023
  Analysis ended on:  Mon Aug  7 19:49:07 2023
  Total elapsed time: 00:00:15
```

Armorlite Drive - Post-Project Miitigated Continuous Simulation Model



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.1)

1900 Armorlite Drive - Post-Project Miitigated

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Flow Routing Method ..... KINWAVE
Starting Date 09/24/1964 06:00:00
Ending Date 05/23/2008 22:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 04:00:00
Routing Time Step ..... 60.00 sec

**********	Volume	Depth
Runoff Quantity Continuity	acre-feet	inches
**********	---	---
Total Precipitation	124.770	611.120
Evaporation Loss	5.332	26.117
Infiltration Loss	96.646	473.369
Surface Runoff	25.213	123.494
Final Storage	0.000	0.000
Continuity Error (%)	-1.941	

**********	Volume	Volume
Flow Routing Continuity	acre-feet	10^6 gal
**********	---	---
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	25.213	8.216
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	25.211	8.215
Flooding Loss	0.000	0.000

```
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.000         0.000
  Continuity Error (%) .....         0.010


  ******************************
  Highest Flow Instability Indexes
  ******************************
  All links are stable.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :    59.00 sec
  Average Time Step           :    60.00 sec
  Maximum Time Step           :    60.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     1.00
  % of Steps Not Converging   :     0.00


  **************************
  Subcatchment Runoff Summary
  **************************


-------------------------------------------------------------------------------
----------------------------------------
                            Total      Total      Total      Total     Imperv
Perv      Total       Total     Peak  Runoff
                          Precip      Runon       Evap      Infil     Runoff
Runoff     Runoff      Runoff   Runoff   Coeff
  Subcatchment                in         in         in         in         in
 in         in    10^6 gal      CFS

-------------------------------------------------------------------------------
----------------------------------------
  P1                        611.12       0.00      26.00     468.20       0.00
129.20     129.20        1.23     0.28   0.211
  P2                        611.12       0.00      26.07     471.26       0.00
125.79     125.79        1.95     0.44   0.206
  P4                        611.12       0.00      26.11     472.74       0.00
124.16     124.16        0.30     0.07   0.203
  P5                        611.12       0.00      25.27     456.74       0.00
143.50     143.50        0.04     0.01   0.235
  P3                        611.12       0.00      26.17     475.63       0.00
121.00     121.00        4.70     1.05   0.198
```

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
POC2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
POC1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
POC3	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
VAULT	STORAGE	0.00	4.31	4.31	802 03:27	4.31

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
POC2	OUTFALL	0.07	0.07	10332 11:01	0.303	0.303	0.000
POC1	OUTFALL	0.00	1.06	802 03:27	0	7.87	0.000
POC3	OUTFALL	0.01	0.01	10332 11:01	0.039	0.039	0.000
VAULT	STORAGE	1.77	1.77	10332 11:01	7.87	7.87	0.011

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
VAULT	0.013	0	0	0	14.446	96	802 03:27	1.06

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
POC2	0.40	0.01	0.07	0.303
POC1	1.17	0.07	1.06	7.872
POC3	0.13	0.00	0.01	0.039
System	0.57	0.07	1.11	8.215

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
CURVE	DUMMY	1.06	802 03:27			

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Aug 10 09:29:03 2023
Analysis ended on: Thu Aug 10 09:29:21 2023
Total elapsed time: 00:00:18

Outlet Configuration

Low Orifice		
Invert Elev:	0.00	ft
Diameter:	2.500	in
Num. Of Openings:	1.00	
Cg:	0.60	
Diameter:	0.2083333	ft

Mid Orifice (NOT USED)		
Invert Elev:		ft
Diameter:		in
Num. of Openings:		
Cg:	0.60	
Diameter:	0	ft

Lower Slot (NOT USED)		
Invert:		ft
Base:		ft
Height:		ft
Num. of Openings:		
Cg:	0.6	
Cw:	3.100	

Upper Slot (NOT USED)		
Invert:		ft
Num. of Openings:		
Base:		ft
Height:		ft
Cg:	0.6	
Cw:	3.100	

Emergency Weir		
Invert:	4.000	ft
L:	1.330	ft
Cw:	3.100	

h (inches)	h (feet)	Qlow-orif (cfs)	Qmid-orif (cfs)	Qlower-slot-weir (cfs)	Qlower-slot-orifice (cfs)	Qlower-slot-total (cfs)	Qupper-slot-weir (cfs)	Qupper-slot-orifice (cfs)	Qupper-total (cfs)	Qemergency (cfs)	h (feet)	QTOTAL (cfs)
					~CALCULATIONS~						~SWMM INPUT~	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.500	0.042	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.034
1.000	0.083	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.047
1.500	0.125	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.058
2.000	0.167	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.167	0.067
2.500	0.208	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.208	0.075
3.000	0.250	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.082
3.500	0.292	0.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.292	0.089
4.000	0.333	0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.095
4.500	0.375	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.101
5.000	0.417	0.106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.417	0.106
5.500	0.458	0.111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.458	0.111
6.000	0.500	0.116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.116
6.500	0.542	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.542	0.121
7.000	0.583	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.583	0.125
7.500	0.625	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.130
8.000	0.667	0.134	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.134
8.500	0.708	0.138	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.708	0.138
9.000	0.750	0.142	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.142
9.500	0.792	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.792	0.146
10.000	0.833	0.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.150
10.500	0.875	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.154
11.000	0.917	0.157	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.917	0.157
11.500	0.958	0.161	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.958	0.161
12.000	1.000	0.164	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.164
12.500	1.042	0.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.042	0.168
13.000	1.083	0.171	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.083	0.171
13.500	1.125	0.174	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.125	0.174
14.000	1.167	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.167	0.177
14.500	1.208	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.208	0.180
15.000	1.250	0.184	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.250	0.184
15.500	1.292	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.292	0.187
16.000	1.333	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.333	0.190
16.500	1.375	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.375	0.192
17.000	1.417	0.195	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.417	0.195
17.500	1.458	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.458	0.198
18.000	1.500	0.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.500	0.201
18.500	1.542	0.204	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.542	0.204
19.000	1.583	0.207	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.583	0.207
19.500	1.625	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.625	0.209
20.000	1.667	0.212	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667	0.212
20.500	1.708	0.215	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.708	0.215
21.000	1.750	0.217	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.750	0.217
21.500	1.792	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.792	0.220
22.000	1.833	0.222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.833	0.222
22.500	1.875	0.225	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.875	0.225
23.000	1.917	0.227	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.917	0.227
23.500	1.958	0.230	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.958	0.230
24.000	2.000	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.000	0.232
24.500	2.042	0.235	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.042	0.235
25.000	2.083	0.237	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.083	0.237

25.500	2.125	0.239	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.125	0.239
26.000	2.167	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.167	0.242
26.500	2.208	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.208	0.244
27.000	2.250	0.246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.250	0.246
27.500	2.292	0.248	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.292	0.248
28.000	2.333	0.251	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.333	0.251
28.500	2.375	0.253	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.375	0.253
29.000	2.417	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.417	0.255
29.500	2.458	0.257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.458	0.257
30.000	2.500	0.260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.500	0.260
30.500	2.542	0.262	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.542	0.262
31.000	2.583	0.264	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.583	0.264
31.500	2.625	0.266	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.625	0.266
32.000	2.667	0.268	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.667	0.268
32.500	2.708	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.708	0.270
33.000	2.750	0.272	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.750	0.272
33.500	2.792	0.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.792	0.274
34.000	2.833	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.833	0.276
34.500	2.875	0.278	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.875	0.278
35.000	2.917	0.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.917	0.280
35.500	2.958	0.282	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.958	0.282
36.000	3.000	0.284	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	0.284
36.500	3.042	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.042	0.286
37.000	3.083	0.288	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.083	0.288
37.500	3.125	0.290	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.125	0.290
38.000	3.167	0.292	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.167	0.292
38.500	3.208	0.294	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.208	0.294
39.000	3.250	0.296	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.250	0.296
39.500	3.292	0.298	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.292	0.298
40.000	3.333	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.333	0.300
40.500	3.375	0.302	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.375	0.302
41.000	3.417	0.303	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.417	0.303
41.500	3.458	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.458	0.305
42.000	3.500	0.307	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.500	0.307
42.500	3.542	0.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.542	0.309
43.000	3.583	0.311	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.583	0.311
43.500	3.625	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.625	0.313
44.000	3.667	0.314	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.667	0.314
44.500	3.708	0.316	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.708	0.316
45.000	3.750	0.318	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.750	0.318
45.500	3.792	0.320	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.792	0.320
46.000	3.833	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.833	0.321
46.500	3.875	0.323	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.875	0.323
47.000	3.917	0.325	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.917	0.325
47.500	3.958	0.327	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.958	0.327
48.000	4.000	0.328	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.000	0.328
48.500	4.042	0.330	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	4.042	0.365
49.000	4.083	0.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	4.083	0.431
49.500	4.125	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.182	4.125	0.516
50.000	4.167	0.335	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.281	4.167	0.616
50.500	4.208	0.337	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392	4.208	0.729
51.000	4.250	0.338	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.515	4.250	0.854
51.500	4.292	0.340	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.649	4.292	0.989
52.000	4.333	0.342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.793	4.333	1.135
52.500	4.375	0.343	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.947	4.375	1.290
53.000	4.417	0.345	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.109	4.417	1.454
53.500	4.458	0.347	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.279	4.458	1.626
54.000	4.500	0.348	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.458	4.500	1.806
54.500	4.542	0.350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.644	4.542	1.993

55.000	4.583	0.351	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.837	4.583	2.188
55.500	4.625	0.353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.037	4.625	2.390
56.000	4.667	0.355	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.244	4.667	2.599
56.500	4.708	0.356	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.458	4.708	2.814
57.000	4.750	0.358	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.678	4.750	3.036
57.500	4.792	0.359	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.904	4.792	3.263
58.000	4.833	0.361	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.136	4.833	3.497
58.500	4.875	0.362	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.375	4.875	3.737
59.000	4.917	0.364	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.619	4.917	3.982
59.500	4.958	0.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.868	4.958	4.234
60.000	5.000	0.367	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.123	5.000	4.490

DRAWDOWN CALCULATIONS

Drawdown calculations have been performed using the storage capacity of the proposed basin, and the standard equation for Orifice shown below.

Based on these calculations:
-Entire BMP will drain in 23.5 hours
-No Vector Control Plan is required since structural BMP will drain in less than 96 hrs.

EQUATIONS

Drawdown calculation

$$t(sec) = \frac{2A_t(\sqrt{z_1} - \sqrt{z_2})}{C_d A_o \sqrt{2g}}$$

Equation 17.83 of Civil Engineering Reference Manual 15th edition

Where:
At: Surface Area of Vault (sq ft.)
Z1: Water Elevation of full tank (ft)
Z2: Water Elevation of empty tank (0 ft)
Cd:Discharge Coefficient
Ao: Area of Orifice (sq. ft.)
g: Gravity (32.2 ft/s^2)

Vault Storage

Vault Height (in)	Vault Height (ft)	Storage Area (Sq. ft.)	Max Suface Storage Volume (Cu.ft.)
54	4.50	3350	15075

Drawdown time

Low Orifice	
Diameter (in)	2.50
# of orifices	1
coefficient (cg)	0.614
Ao (sq. ft.)	0.0340885

Drawdown time (sec)	**84617.920**

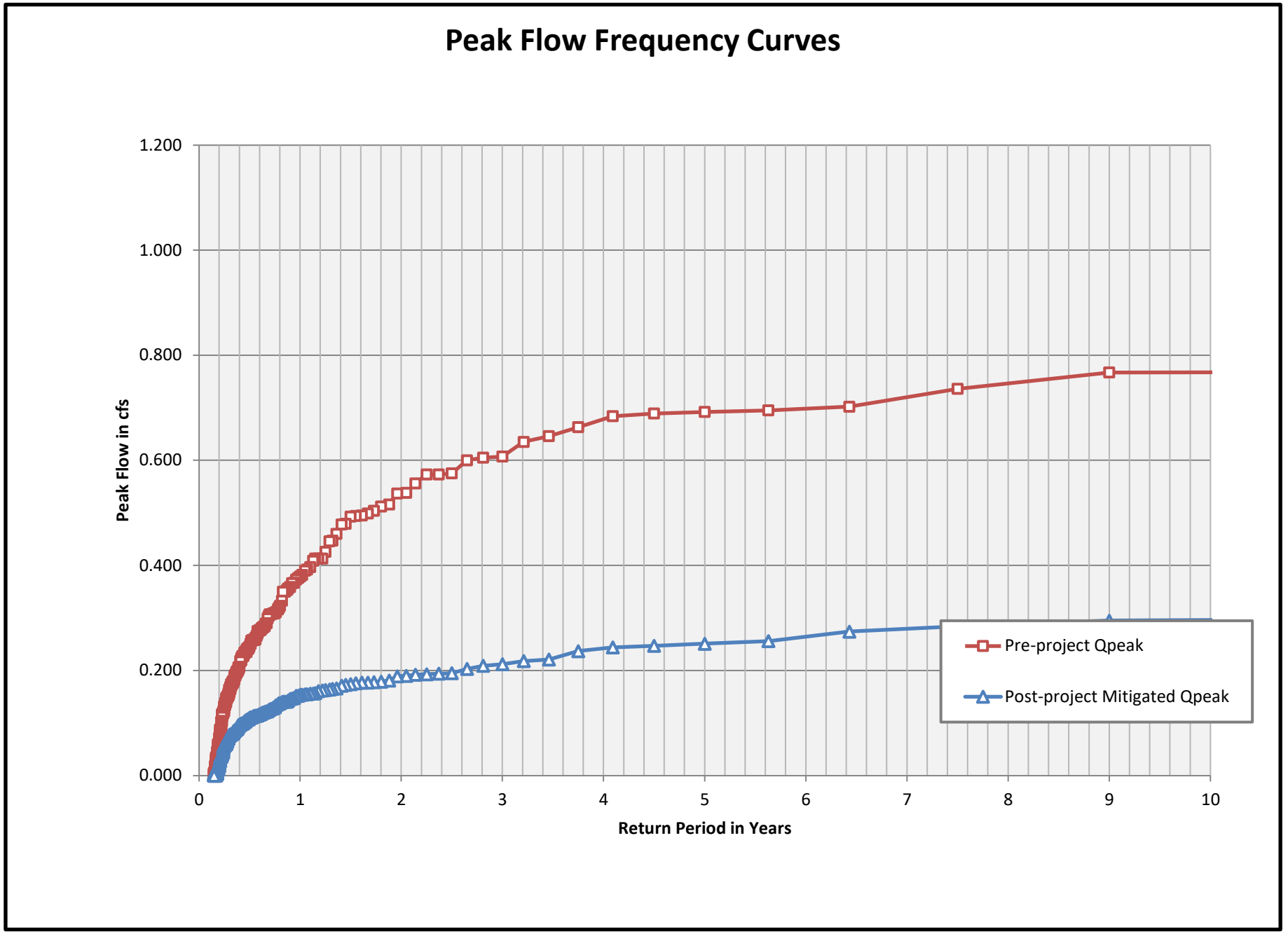
Drawdown time (hr)	**23.505**

POC 1

Peak Flow Frequency Summary

Return Period	Pre-project Qpeak (cfs)	Post-project - Mitigated Q (cfs)
LF = 0.3xQ2	0.161	0.057
2-year	0.537	0.189
5-year	0.692	0.251
10-year	0.767	0.296

POC 1


Peak Flow Frequency Curves
Peak Flow in cfs
1.200
1.000
0.800
0.600
0.400
0.200
0.000
0
1
2
3
4
5
6
7
8
9
10
Return Period in Years
Pre-project Qpeak
Post-project Mitigated Qpeak

POC 1

Low-flow Threshold:	30%	
0.3xQ2 (Pre):	0.161	cfs
Q10 (Pre):	0.767	cfs
Ordinate #:	100	
Incremental Q (Pre):	0.00606	cfs
Total Hourly Data:	382743	hours

Flow Duration Curve Data

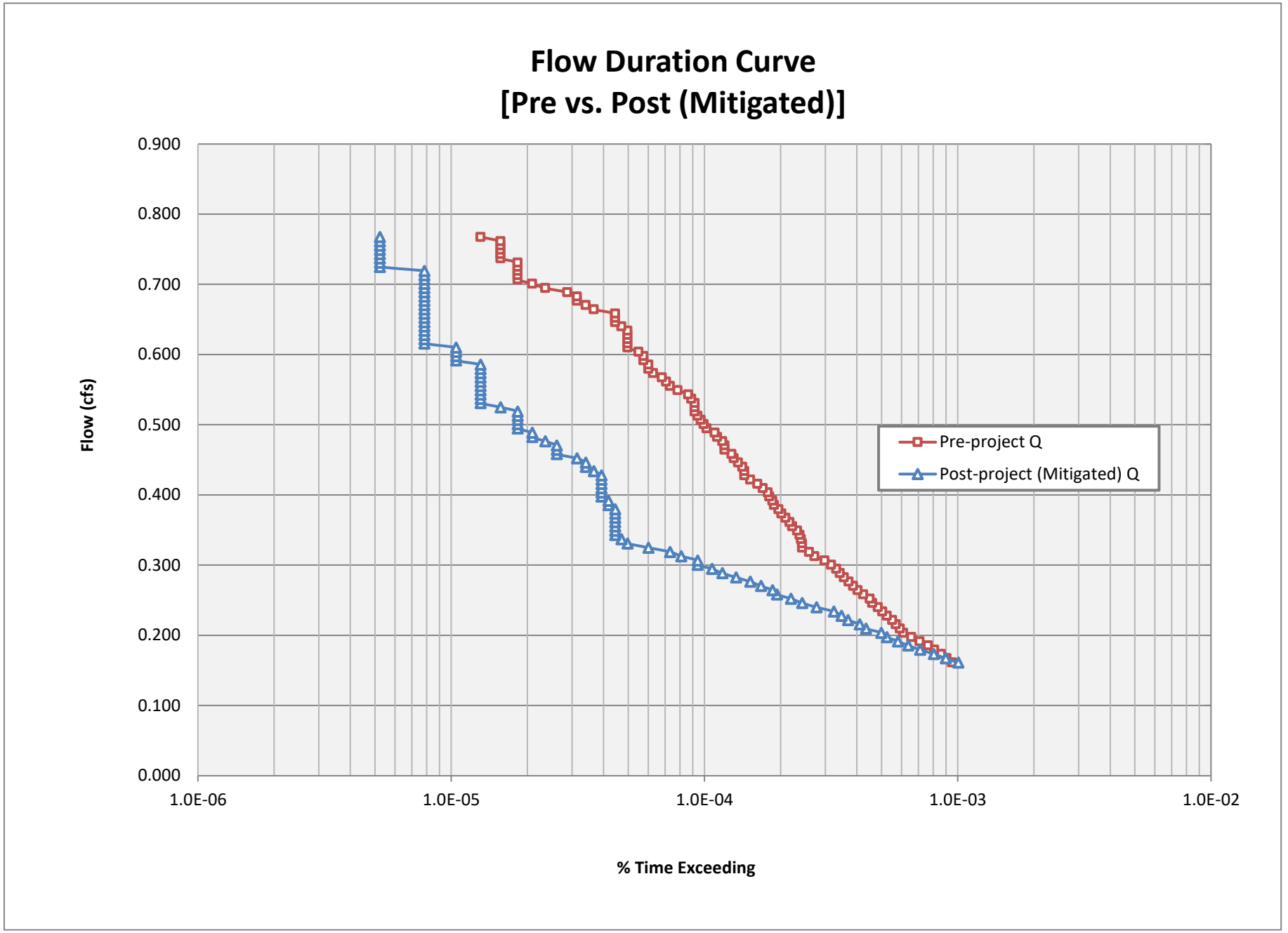
The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	0.161	363	9.48E-04	385	1.01E-03	106%	Pass
1	0.167	346	9.04E-04	343	8.96E-04	99%	Pass
2	0.173	329	8.60E-04	308	8.05E-04	94%	Pass
3	0.179	309	8.07E-04	272	7.11E-04	88%	Pass
4	0.185	292	7.63E-04	244	6.38E-04	84%	Pass
5	0.192	271	7.08E-04	222	5.80E-04	82%	Pass
6	0.198	251	6.56E-04	201	5.25E-04	80%	Pass
7	0.204	233	6.09E-04	191	4.99E-04	82%	Pass
8	0.210	226	5.90E-04	166	4.34E-04	73%	Pass
9	0.216	218	5.70E-04	157	4.10E-04	72%	Pass
10	0.222	211	5.51E-04	141	3.68E-04	67%	Pass
11	0.228	201	5.25E-04	133	3.47E-04	66%	Pass
12	0.234	193	5.04E-04	124	3.24E-04	64%	Pass
13	0.240	185	4.83E-04	106	2.77E-04	57%	Pass
14	0.246	176	4.60E-04	93	2.43E-04	53%	Pass
15	0.252	172	4.49E-04	84	2.19E-04	49%	Pass
16	0.258	162	4.23E-04	74	1.93E-04	46%	Pass
17	0.264	154	4.02E-04	71	1.86E-04	46%	Pass
18	0.270	148	3.87E-04	64	1.67E-04	43%	Pass
19	0.276	142	3.71E-04	58	1.52E-04	41%	Pass
20	0.282	136	3.55E-04	51	1.33E-04	38%	Pass
21	0.289	131	3.42E-04	45	1.18E-04	34%	Pass
22	0.295	127	3.32E-04	41	1.07E-04	32%	Pass
23	0.301	121	3.16E-04	36	9.41E-05	30%	Pass
24	0.307	114	2.98E-04	36	9.41E-05	32%	Pass
25	0.313	104	2.72E-04	31	8.10E-05	30%	Pass
26	0.319	99	2.59E-04	28	7.32E-05	28%	Pass
27	0.325	93	2.43E-04	23	6.01E-05	25%	Pass
28	0.331	93	2.43E-04	19	4.96E-05	20%	Pass
29	0.337	92	2.40E-04	18	4.70E-05	20%	Pass
30	0.343	91	2.38E-04	17	4.44E-05	19%	Pass
31	0.349	89	2.33E-04	17	4.44E-05	19%	Pass
32	0.355	85	2.22E-04	17	4.44E-05	20%	Pass
33	0.361	83	2.17E-04	17	4.44E-05	20%	Pass
34	0.367	80	2.09E-04	17	4.44E-05	21%	Pass
35	0.373	77	2.01E-04	17	4.44E-05	22%	Pass
36	0.379	75	1.96E-04	17	4.44E-05	23%	Pass
37	0.386	72	1.88E-04	16	4.18E-05	22%	Pass
38	0.392	71	1.86E-04	16	4.18E-05	23%	Pass
39	0.398	69	1.80E-04	15	3.92E-05	22%	Pass
40	0.404	68	1.78E-04	15	3.92E-05	22%	Pass
41	0.410	65	1.70E-04	15	3.92E-05	23%	Pass
42	0.416	62	1.62E-04	15	3.92E-05	24%	Pass
43	0.422	58	1.52E-04	15	3.92E-05	26%	Pass
44	0.428	55	1.44E-04	15	3.92E-05	27%	Pass
45	0.434	55	1.44E-04	14	3.66E-05	25%	Pass
46	0.440	54	1.41E-04	13	3.40E-05	24%	Pass
47	0.446	52	1.36E-04	13	3.40E-05	25%	Pass
48	0.452	50	1.31E-04	12	3.14E-05	24%	Pass
49	0.458	49	1.28E-04	10	2.61E-05	20%	Pass
50	0.464	46	1.20E-04	10	2.61E-05	22%	Pass
51	0.470	46	1.20E-04	10	2.61E-05	22%	Pass
52	0.476	45	1.18E-04	9	2.35E-05	20%	Pass
53	0.483	43	1.12E-04	8	2.09E-05	19%	Pass
54	0.489	42	1.10E-04	8	2.09E-05	19%	Pass

POC 1

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
55	0.495	39	1.02E-04	7	1.83E-05	18%	Pass
56	0.501	38	9.93E-05	7	1.83E-05	18%	Pass
57	0.507	37	9.67E-05	7	1.83E-05	19%	Pass
58	0.513	36	9.41E-05	7	1.83E-05	19%	Pass
59	0.519	35	9.14E-05	7	1.83E-05	20%	Pass
60	0.525	35	9.14E-05	6	1.57E-05	17%	Pass
61	0.531	35	9.14E-05	5	1.31E-05	14%	Pass
62	0.537	34	8.88E-05	5	1.31E-05	15%	Pass
63	0.543	33	8.62E-05	5	1.31E-05	15%	Pass
64	0.549	30	7.84E-05	5	1.31E-05	17%	Pass
65	0.555	28	7.32E-05	5	1.31E-05	18%	Pass
66	0.561	27	7.05E-05	5	1.31E-05	19%	Pass
67	0.567	26	6.79E-05	5	1.31E-05	19%	Pass
68	0.573	24	6.27E-05	5	1.31E-05	21%	Pass
69	0.580	23	6.01E-05	5	1.31E-05	22%	Pass
70	0.586	23	6.01E-05	5	1.31E-05	22%	Pass
71	0.592	22	5.75E-05	4	1.05E-05	18%	Pass
72	0.598	22	5.75E-05	4	1.05E-05	18%	Pass
73	0.604	21	5.49E-05	4	1.05E-05	19%	Pass
74	0.610	19	4.96E-05	4	1.05E-05	21%	Pass
75	0.616	19	4.96E-05	3	7.84E-06	16%	Pass
76	0.622	19	4.96E-05	3	7.84E-06	16%	Pass
77	0.628	19	4.96E-05	3	7.84E-06	16%	Pass
78	0.634	19	4.96E-05	3	7.84E-06	16%	Pass
79	0.640	18	4.70E-05	3	7.84E-06	17%	Pass
80	0.646	17	4.44E-05	3	7.84E-06	18%	Pass
81	0.652	17	4.44E-05	3	7.84E-06	18%	Pass
82	0.658	17	4.44E-05	3	7.84E-06	18%	Pass
83	0.664	14	3.66E-05	3	7.84E-06	21%	Pass
84	0.670	13	3.40E-05	3	7.84E-06	23%	Pass
85	0.677	12	3.14E-05	3	7.84E-06	25%	Pass
86	0.683	12	3.14E-05	3	7.84E-06	25%	Pass
87	0.689	11	2.87E-05	3	7.84E-06	27%	Pass
88	0.695	9	2.35E-05	3	7.84E-06	33%	Pass
89	0.701	8	2.09E-05	3	7.84E-06	38%	Pass
90	0.707	7	1.83E-05	3	7.84E-06	43%	Pass
91	0.713	7	1.83E-05	3	7.84E-06	43%	Pass
92	0.719	7	1.83E-05	3	7.84E-06	43%	Pass
93	0.725	7	1.83E-05	2	5.23E-06	29%	Pass
94	0.731	7	1.83E-05	2	5.23E-06	29%	Pass
95	0.737	6	1.57E-05	2	5.23E-06	33%	Pass
96	0.743	6	1.57E-05	2	5.23E-06	33%	Pass
97	0.749	6	1.57E-05	2	5.23E-06	33%	Pass
98	0.755	6	1.57E-05	2	5.23E-06	33%	Pass
99	0.761	6	1.57E-05	2	5.23E-06	33%	Pass
100	0.767	5	1.31E-05	2	5.23E-06	40%	Pass

POC 1


Flow Duration Curve
[Pre vs. Post (Mitigated)]
Flow (cfs)
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
1.0E-06
1.0E-05
1.0E-04
1.0E-03
1.0E-02
% Time Exceeding
Pre-project Q
Post-project (Mitigated) Q

ATTACHMENT 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☑ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	☑ Included ☐ Not Applicable

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

☑ **Preliminary Design / Planning / CEQA level submittal:**

Attachment 3a must identify:

- ☑ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ 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

Attachment 3b: For private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the [City Engineer] to obtain the current maintenance agreement forms).

LEGAL DESCRIPTION

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT EXHIBIT 'A'

THE INFORMATION SHOWN HEREON IS PER OWNER'S POLICY OF TITLE INSURANCE ORDER NO.: 00186800-004-RL1-CF2, DATED MARCH 6, 2023, BY CHICAGO TITLE INSURANCE COMPANY. NO RESPONSIBILITY OF COMPLETENESS OR ACCURACY OF SAID TITLE COMMITMENT IS ASSUMED BY THIS MAP OR THE SURVEYOR.

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF SAN MARCOS, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1: APN: 219-162-57-00 (PORTION)

PARCEL B OF PARCEL MAP NO. 21967, IN THE CITY OF SAN MARCOS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, RECORDED SEPTEMBER 15, 2022 AS INSTRUMENT NO. 2022-7000461 OF OFFICIAL RECORDS OF SAID COUNTY.

EXCEPTING ALL MINERALS CONTAINED IN THE ABOVE-DESCRIBED LAND, INCLUDING, WITHOUT LIMITING THE GENERALITY THEREOF, OIL, GAS AND OTHER HYDROCARBON SUBSTANCES, AS WELL AS THE METALLIC OR OTHER SOLID MINERALS, LYING NOT LESS THAN FIVE HUNDRED (500) FEET BELOW THE SURFACE THEREOF, AND SHALL NOT HAVE THE RIGHT TO GO UPON OR USE THE SURFACE OF SAID LAND, OR ANY PART THEREOF, FOR THE PURPOSE OF DRILLING FOR, MINING, OR OTHERWISE REMOVING, ANY OF SAID MINERALS. THE RIGHT TO REMOVE ANY OF SAID MINERALS FROM SAID LAND BY MEANS OF WELLS, SHAFTS, TUNNELS OR OTHER MEANS OF ACCESS TO SAID MINERALS WHICH MAY BE CONSTRUCTED, DRILLED OR DUG FROM OTHER LAND, PROVIDED THAT THE EXERCISE SHALL IN NO WAY INTERFERE WITH OR IMPAIR THE USE OF THE SURFACE OF THE LAND HEREBY CONVEYED OR OF ANY IMPROVEMENTS THEREON, AS RESERVED IN DEED RECORDED SEPTEMBER 19, 1986 AS INSTRUMENT NO. 86-412539 OF OFFICIAL RECORDS.

PARCEL 2:

A NON-EXCLUSIVE, PERPETUAL, IRREVOCABLE EASEMENT FOR THE RIGHT OF VEHICULAR INGRESS TO AND EGRESS OVER, SOLELY IN THE CASE OF EMERGENCY SITUATIONS AND ONLY BY EMERGENCY VEHICLES, PURSUANT AND SUBJECT TO THE TERMS AND PROVISIONS CONTAINED IN THE "GRANT OF DRIVEWAY ACCESS EASEMENT AGREEMENT" RECORDED MARCH 6, 2023 AS INSTRUMENT NO. 2023-0056553 OF OFFICIAL RECORDS, UPON, ACROSS, OVER AND ABOVE THAT PORTION OF PARCEL A OF SAID PARCEL MAP NO. 21967, DESCRIBED AS FOLLOWS:

COMMENCING AT THE MOST NORTHERLY CORNER OF SAID PARCEL MAP NO. 21967, THENCE SOUTH 23°30'45" WEST 23.85 FEET ALONG THE NORTHWESTERLY LINE OF SAID PARCEL A TO THE TRUE POINT OF BEGINNING;

THENCE SOUTH 54°33'15" EAST 20.16 FEET;

THENCE SOUTH 66°39'18" EAST 79.21 FEET;

THENCE SOUTH 74°00'24" EAST 20.19 FEET;

THENCE SOUTH 66°24'23" EAST 53.65 FEET TO THE SOUTHEASTERLY LINE OF SAID PARCEL A;

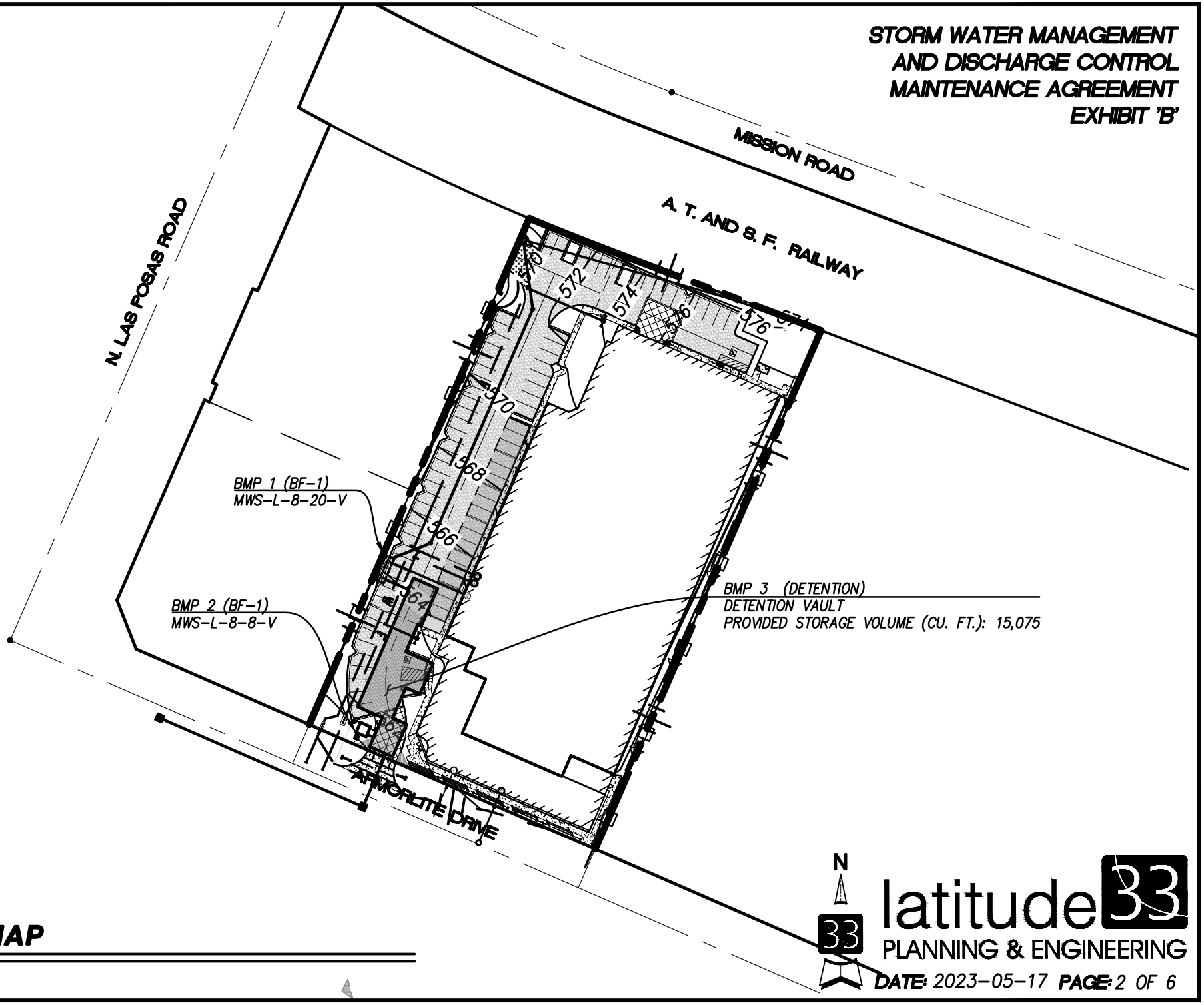
THENCE SOUTH 23°29'20" WEST 29.34 FEET ALONG SAID SOUTHEASTERLY LINE OF PARCEL A;

THENCE NORTH 66°09'55" WEST 172.61 FEET ALONG SAID NORTHWESTERLY LINE OF PARCEL A;

THENCE NORTH 23°30'45" EAST 29.73 FEET ALONG SAID NORTHWESTERLY LINE OF PARCEL A TO THE TRUE POINT OF BEGINNING

latitude 33
PLANNING & ENGINEERING

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT EXHIBIT 'B'



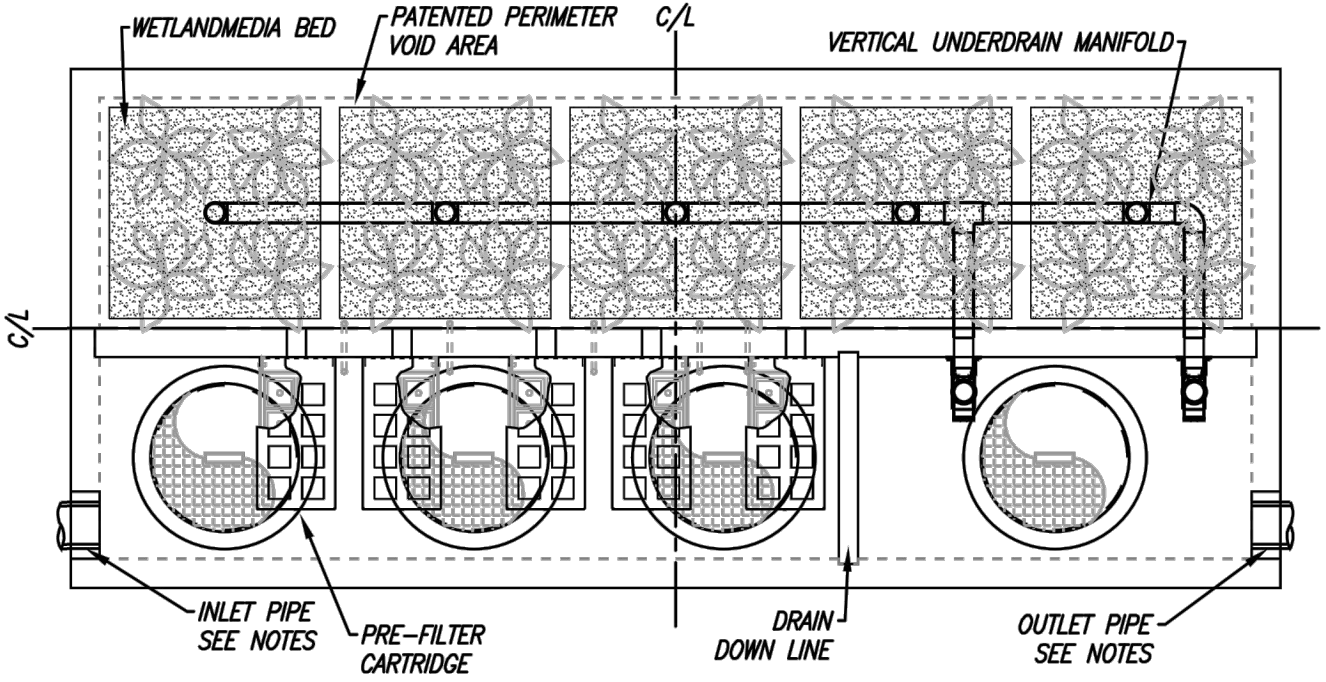
KEY MAP

1" = 100'

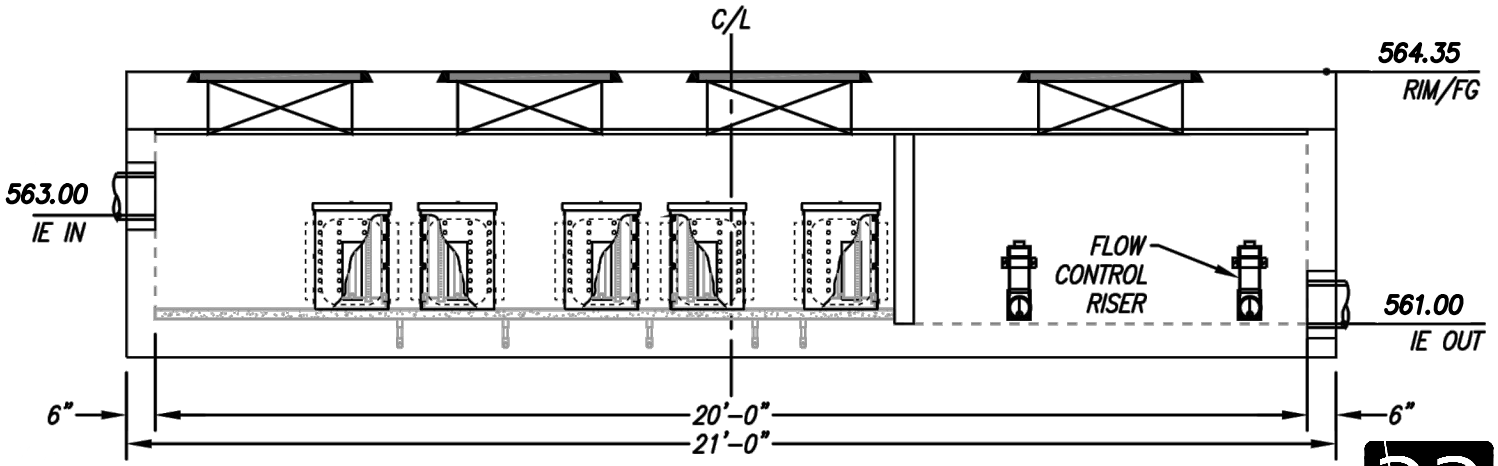
N

latitude 33
PLANNING & ENGINEERING

DATE: 2023-05-17 **PAGE:** 2 OF 6



PLAN VIEW

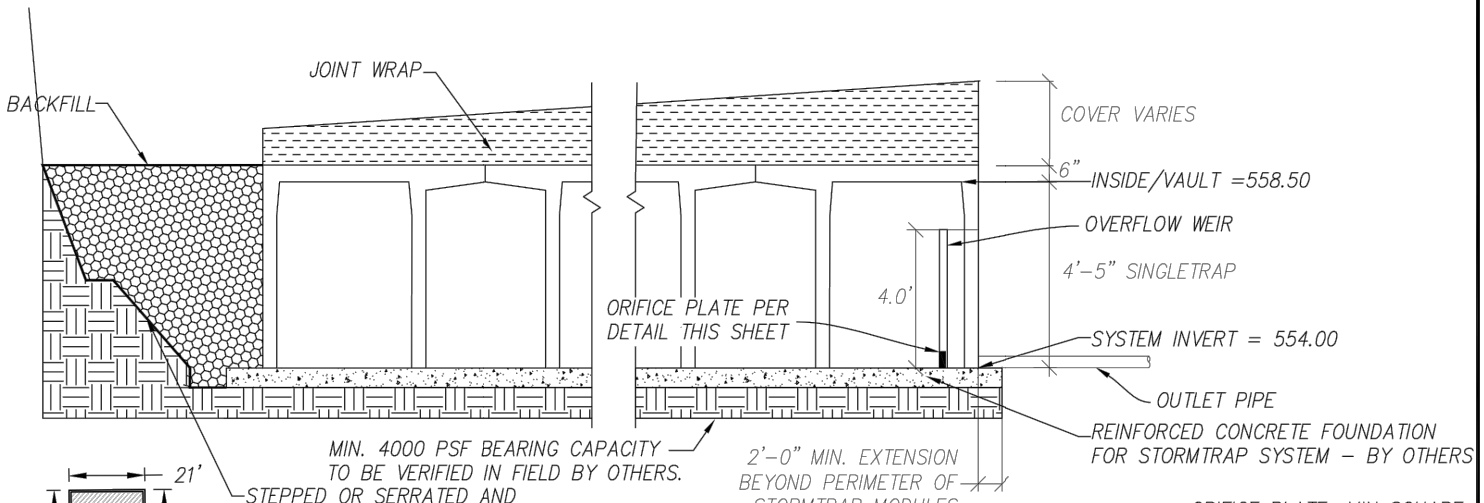


ELEVATION VIEW

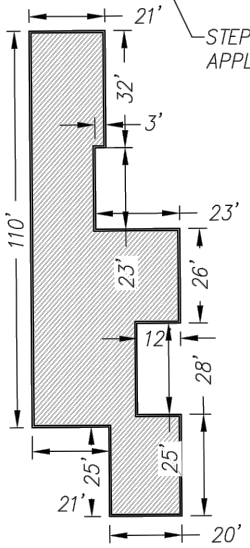
BMP 1: MODULAR WETLAND SYSTEM MWS-L-8-20-V

NO SCALE

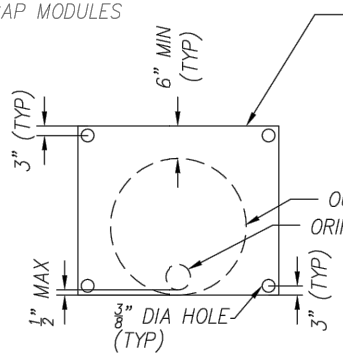
latitude 33
PLANNING & ENGINEERING



VAULT SECTION
NO SCALE



VAULT LAYOUT
NO SCALE



FLOW CONTROL ORIFICE PLATE

VOLUME REQUIRED: 12,208 CUBIC FEET
VOLUME PROVIDED: 15,075 CUBIC FEET

VAULT
NO SCALE

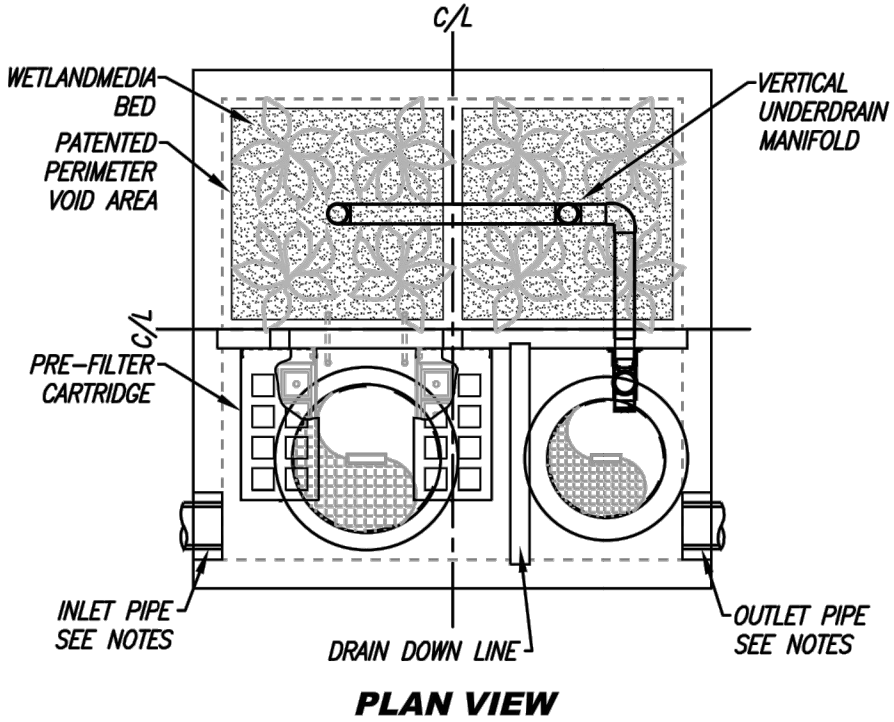
STORMTRAP DETAIL

SCALE:	NO SCALE	**JOB NO.:**	1900.00
DATE:	8/10/2023	**SHEET:**	1 OF 1

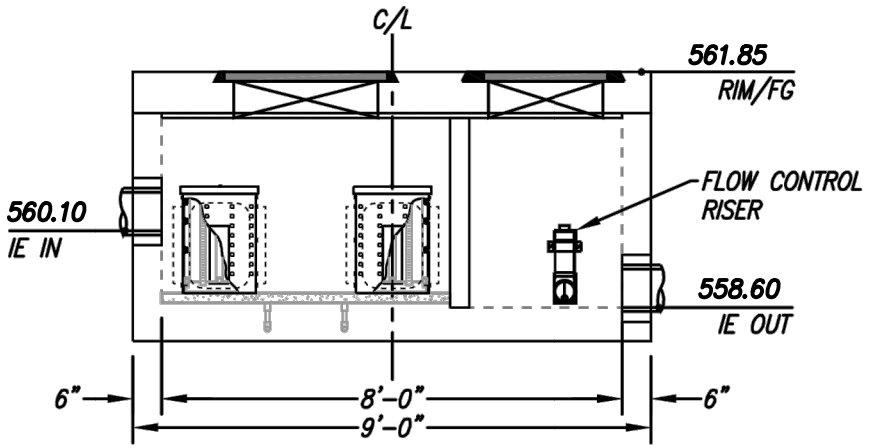
BMP 3: STORMTRAP STORMWATER DETENTION VAULT

NO SCALE

latitude 33
PLANNING & ENGINEERING



PLAN VIEW



ELEVATION VIEW

BMP 2: MODULAR WETLAND SYSTEM MWS-L-8-8-V

NO SCALE

latitude 33
PLANNING & ENGINEERING

BMP DESCRIPTION	MAINTENANCE TASK	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	SHEET NUMBER(S)
	POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS				
	STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: XXXXX				
	O&M RESPONSIBLE PARTY DESIGNEE: (PROPERTY OWNER) / HOA / CITY / OTHER				
POLLUTANT CONTROL					
MODULAR WETLANDS SYSTEM	TRASH & SEDIMENT REMOVAL	EVERY 6-24 MONTHS	TASKS INCLUDE TRASH REMOVAL FROM SCREENING DEVICE AND SEDIMENT REMOVAL FROM SEPARATION CHAMBER.	2	C4, C6, C7
	REPLACE FILTER MEDIA	EVERY 12-24 MONTHS	REPLACE CARTRIDGE FILTER MEDIA AND DRAIN DOWN FILTER MEDIA.		
	TRIM VEGETATION	EVERY 6-12 MONTHS	INSPECT AND VACUUM IF NECESSARY.		
HYDROMODIFICATION					
DETENTION STORAGE VAULT	VAULT INSPECTION	EVERY 6 MONTHS	INSPECT AND VACUUM IF NECESSARY	1	C4, C6, C7

ATTACHMENT 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

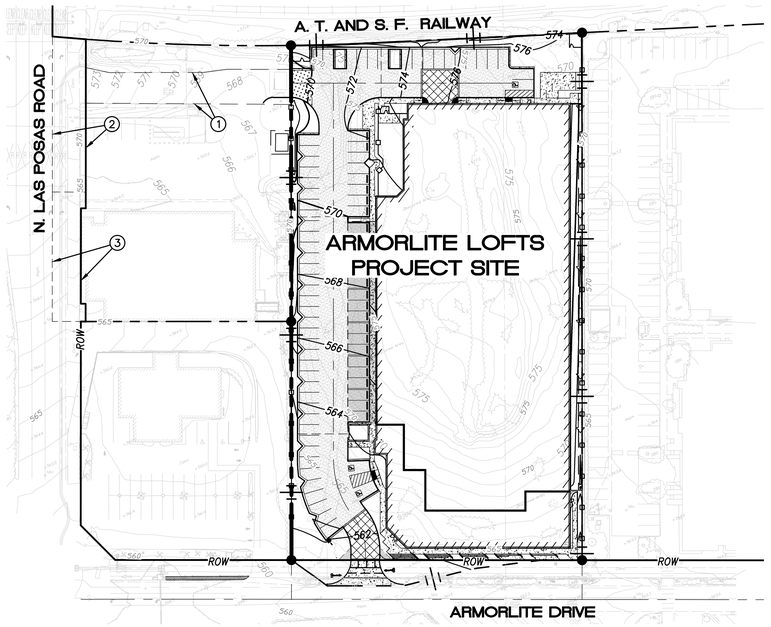
This is the cover sheet for Attachment 4.

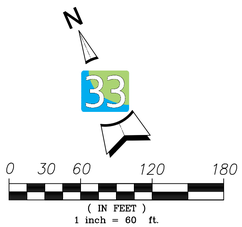
Use this checklist to ensure the required information has been included on the plans:

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. Photocopies of general brochures are not acceptable.

CONCEPTUAL GRADING PLAN FOR ARMORLITE LOFTS (SP23-0001)





APPLICANT
LAS POSAS VENTURES, LLC
705 B STREET, SUITE 3010
SAN DIEGO, CA 92101

CIVIL ENGINEER
LATITUDE 33 PLANNING & ENGINEERING
10731 TREENA STREET
SAN DIEGO, CA 92131

ARCHITECT
SUMMA ARCHITECTURE
5256 S MISSION ROAD, APT 404
BONSALL, CA 92003

LANDSCAPE
GMP
3176 LIONSHEAD AVENUE, SUITE 102
CARLSBAD, CA 92010

SHEET INDEX

GRADING INFORMATION

TOTAL CUT/EXPORT	6950 CY
TOTAL FILL/IMPORT	4400 CY
NET	2250 CY EXPORT

PROJECT DESCRIPTION
THE PROPOSED DEVELOPMENT CONSISTS OF 165 RESIDENTIAL UNITS, 5,600 SF OF COMMERCIAL SPACE AND COVERED PARKING GARAGE IN A MIXED USE BUILDING. THE DEVELOPMENT WILL ALSO INCLUDE ONSITE SURFACE PARKING, RETAINING WALLS, SURFACE IMPROVEMENTS FOR DRIVE AISLES AND PEDESTRIAN WALKWAYS, AND ASSOCIATED CIVIL UTILITY SERVICES.

PROJECT INFORMATION
DOMESTIC WATER DISTRICT–VALLECITOS WATER DISTRICT
SANITATION DISTRICT – VALLECITOS WATER DISTRICT
EXISTING ZONING – P-1
PROPOSED ZONING – SPA
WATER SHED – CARLSBAD
AREA – SAN MARCOS
SUBAREA – RICHLAND #904.52

APN: 2191626200
PARCEL AREA: 2.44 ACRES
PROPOSED IMPERVIOUS AREA: 2.17 ACRES
PROPOSED PERVIOUS AREA: 0.27 ACRES

LEGAL DESCRIPTION
LOT B IN THE CITY OF SAN MARCOS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO PARCEL MAP THEREOF NO. 21967, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 15, 2022.

FEMA FIRM DESIGNATION
FIRM PANEL #: 06073C0789H
FLOOD ZONE: ZONE X

EXISTING EASEMENTS
1. PRIVATE DRIVEWAY ACCESS EASEMENT PER DOC. NO. 2023-0056553
2. PUBLIC STREET AND UTILITY AND DRAINAGE EASEMENT PER DOC. NO. 2001-0105891
3. PUBLIC STREET AND UTILITY AND DRAINAGE EASEMENT PER DOC. NO. 2002-669378

BASIS OF BEARINGS
BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS SURVEY IS THE NORTH AMERICAN DATUM OF 1983 (NAD83 EPOCH 2017.5), CALIFORNIA COORDINATE SYSTEM 1983 (CCS83), ZONE 6 (0406). THIS IS DETERMINED BY AN OBSERVED LINE BETWEEN STATION NO. 78-15L AND STATION NO. CP-010 PER CITY OF SAN MARCOS RECORD OF SURVEY NO. 23731.

- POINT NO. 78-15L: N-1,996,718.03 SFT. E-6,284,542.25 SFT.
- BEARING – 78-15L TO CP-010 = NORTH 49°34'24" EAST (GRID)

QUOTED BEARINGS FROM REFERENCE MAPS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM.

THE COMBINED GRID FACTOR AT STATION NO. 78-15L IS 0.99995969. GRID DISTANCE = GROUND DISTANCE X COMBINED GRID FACTOR.

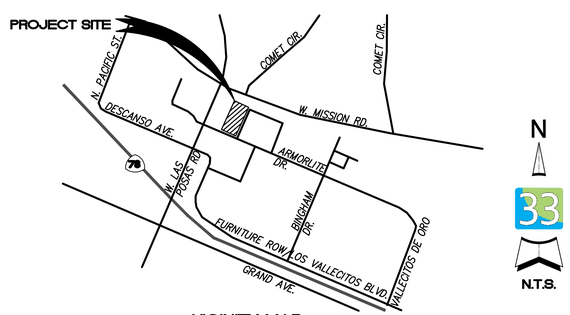
ALL DISTANCES SHOWN HEREIN ARE GROUND DISTANCES, UNLESS OTHERWISE NOTED.

BENCHMARK
BASIS OF ELEVATION/BENCHMARK: THE BASIS OF ELEVATION FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NGVD88). THIS IS DETERMINED BY AN OBSERVED POSITION AT STATION NO. 97, BEING A CALTRANS 2" BRASS DISC IN THE TOP OF CURB ON THE SOUTH SIDE OF MISSION ROAD 215 FEET WESTERLY OF THE DRIVEWAY TO MISSION VILLAS PER CITY OF SAN MARCOS RECORD OF SURVEY NO. 23731.

- CITY OF SAN MARCOS BENCHMARK ELEVATION = 595.90 FT.

LEGEND

RIGHT-OF-WAY	ROW
PROPERTY LINE	
STREET CENTER LINE	
DAYLIGHT LINE	
PROPOSED CONTOURS	300
PROPOSED GRADE BREAK	
PROPOSED RETAINING WALL	
PROPOSED CURB	
PROPOSED CURB & GUTTER	
PROPOSED PCC BROW DITCH	
PROPOSED TRUNCATED DOMES	
PROPOSED AC PAVEMENT	
PROPOSED PCC PAVEMENT	
PROPOSED PCC SIDEWALK	
PROPOSED BUILDING	
PROPOSED FINISHED FLOOR AND PAD ELEVATIONS	FF XXX.X PAD XXX.X
PROPOSED MODULAR WETLAND SYSTEM	
PROPOSED UNDERGROUND VAULT	
PROPOSED WATER LATERAL	W
PROPOSED FIRE LATERAL	FS
PROPOSED SEWER LATERAL	S
PROPOSED ROOF DRAIN OUTLET	RD
PROPOSED IRRIGATION LATERAL OUTLET	I
PROPOSED STORM DRAIN STRUCTURE	
PROPOSED STORM DRAIN LINE	
PROPOSED WATER METER	M
PROPOSED BACKFLOW PREVENTER	
PROPOSED WATER LINE	W
PROPOSED FIRE WATER LINE	F
PROPOSED SEWER MANHOLE	
PROPOSED SEWER CLEANOUT	
PROPOSED SEWER LINE	S
EXISTING CONTOURS	290
EXISTING WATER LINE	W
EXISTING STORM DRAIN LINE	
EXISTING SEWER LINE	S
EXISTING FIRE HYDRANT	
EXISTING FENCE LINE	
EXISTING TREE	
EXISTING STREET LIGHT	
EXISTING CURB INLET	MH
EXISTING SEWER MANHOLE	MH



VICINITY MAP

STATEMENT OF ENGINEER OF WORK
THE UNDERSIGNED ENGINEER AGREES THAT THE WORK PERFORMED BY THE ENGINEER SHALL COMPLY WITH THE GENERALLY ACCEPTED STANDARDS AND PRACTICES OF THE ENGINEER'S TRADE OR PROFESSION. THE ENGINEER FURTHER AGREES THAT THE WORK PERFORMED HEREIN SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS REQUIRED BY THE CITY OF ENCINITAS, TO THE EXTENT THAT THE ENGINEER CONTROLS SUCH PERFORMANCE. THE ENGINEER AGREES THAT ANY PLANCHECK OR REVIEW PERFORMED BY THE CITY OF ENCINITAS IN ITS CAPACITY AS A PUBLIC ENTITY FOR THE PLANS PREPARED BY THE ENGINEER IS NOT A DETERMINATION BY THE CITY OF ENCINITAS OF THE TECHNICAL SUFFICIENCY OR ADEQUACY OF THE PLANS OR DESIGN AND IT THEREFORE DOES NOT RELIEVE THE ENGINEER OF RESPONSIBILITY FOR THE PLANS OR DESIGN OF IMPROVEMENTS BASED THEREON. THE ENGINEER AGREES TO INDEMNIFY AND HOLD HARMLESS THE CITY OF ENCINITAS AND ITS OFFICERS, AGENTS, AND EMPLOYEES FROM PROPERTY DAMAGE OR BODILY INJURY ARISING SOLELY FROM THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS OF THE ENGINEER AND HIS/HER AGENTS OR EMPLOYEES ACTING WITHIN THE COURSE AND SCOPE OF SUCH AGENCY AND EMPLOYMENT AND ARISING OUT OF THE WORK PERFORMED BY THE ENGINEER.

SIGNATURE: _____ DATE: _____
GIO POSILLICO
LATITUDE 33 PLANNING AND ENGINEERING
10731 TREENA STREET, CA 92131
PHONE NUMBER 858-751-0633
RCE EXPIRES 06/30/2025

latitude 33
PLANNING & ENGINEERING
10731 Treena Street, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER
GIOVANNI POSILLICO
No. 86332
CIVIL
STATE OF CALIFORNIA

DATE	REVISION	BY
6/5/2023	1ST SUBMITTAL	L33

COVER SHEET

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

L33 PROJECT NUMBER (PN): 1900.00			
OTHER PN: NA			
DESIGNED BY:	JS	DATE:	10/22/24
DRAWN BY:	JS	DATE:	10/22/24
CHECKED BY:	JG	DATE:	10/22/24

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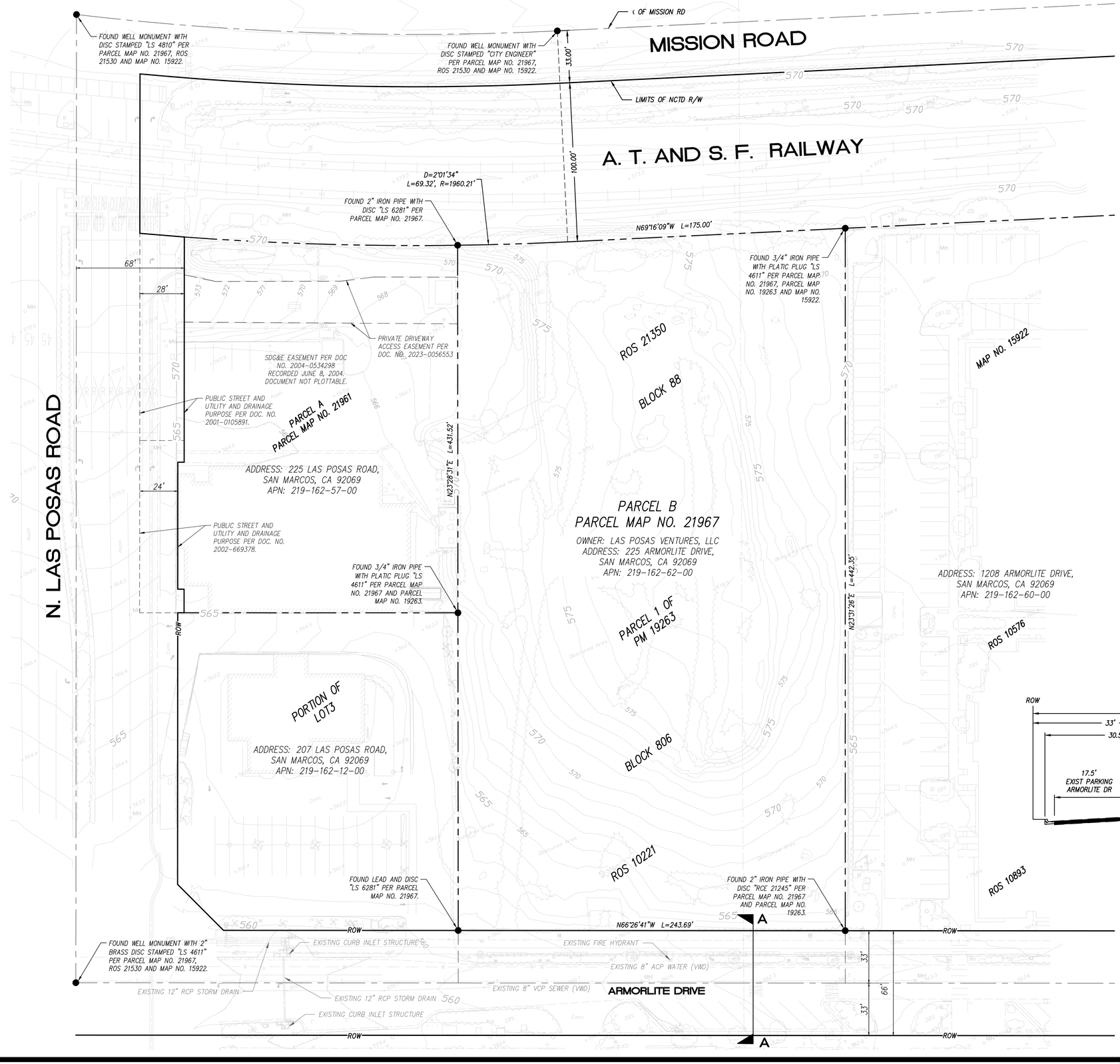

latitude 33
PLANNING & ENGINEERING
10731 Treena Street, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER
GIOVANNI POSTIGLIONE
No. 88332
Exp. 06-30-25
CIVIL
STATE OF CALIFORNIA

DATE	REVISION	BY
6/5/2023	1ST SUBMITTAL	L33

EXISTING CONDITIONS PLAN

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

L33 PROJECT NUMBER (PN): 1900.00		
OTHER PN: NA		
DESIGNED BY:	JS	DATE: 10/22/24
DRAWN BY:	JS	DATE: 10/22/24
CHECKED BY:	JG	DATE: 10/22/24

SHEET
C2

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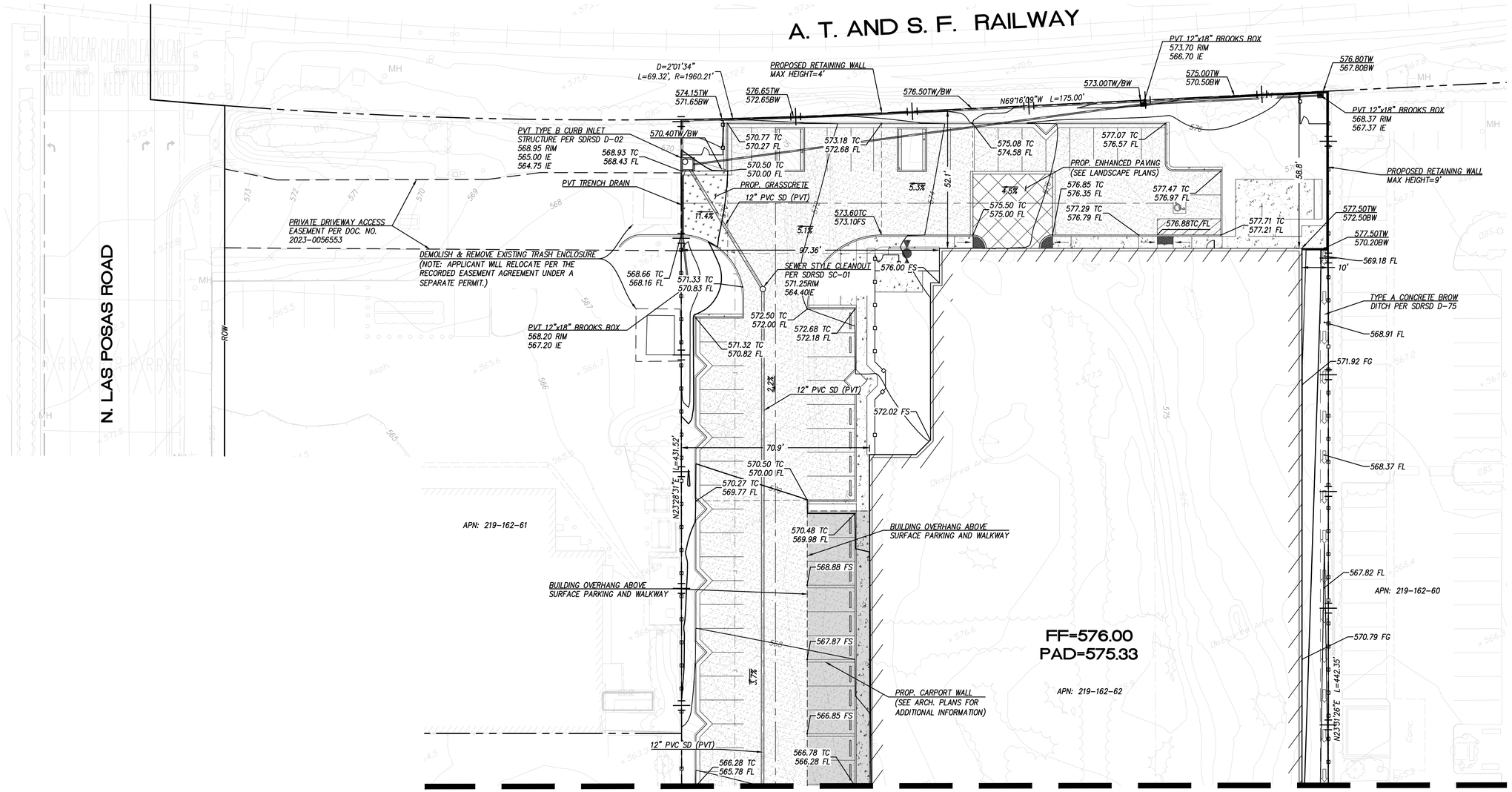
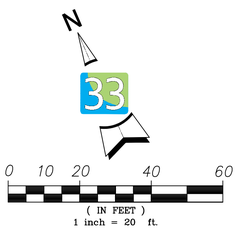
H:\1900\1900.00 - Cross Real Estate - 225 Las Posas\Engineering\Plans\General Application Package\1900.0 Existing Conditions Plan - C2.dwg



SEE SHEET C4



latitude 33
PLANNING & ENGINEERING
10731 Treena Street, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER
GIOVANNI POSTIL
No. 86332
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CIVIL
STATE OF CALIFORNIA

BY	DATE	REVISION
L33	6/5/2023	1ST SUBMITTAL

GRADING AND DRAINAGE PLAN

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

L33 PROJECT NUMBER (PN):	1900.00
OTHER PN:	NA
DESIGNED BY: JS	DATE: 10/22/24
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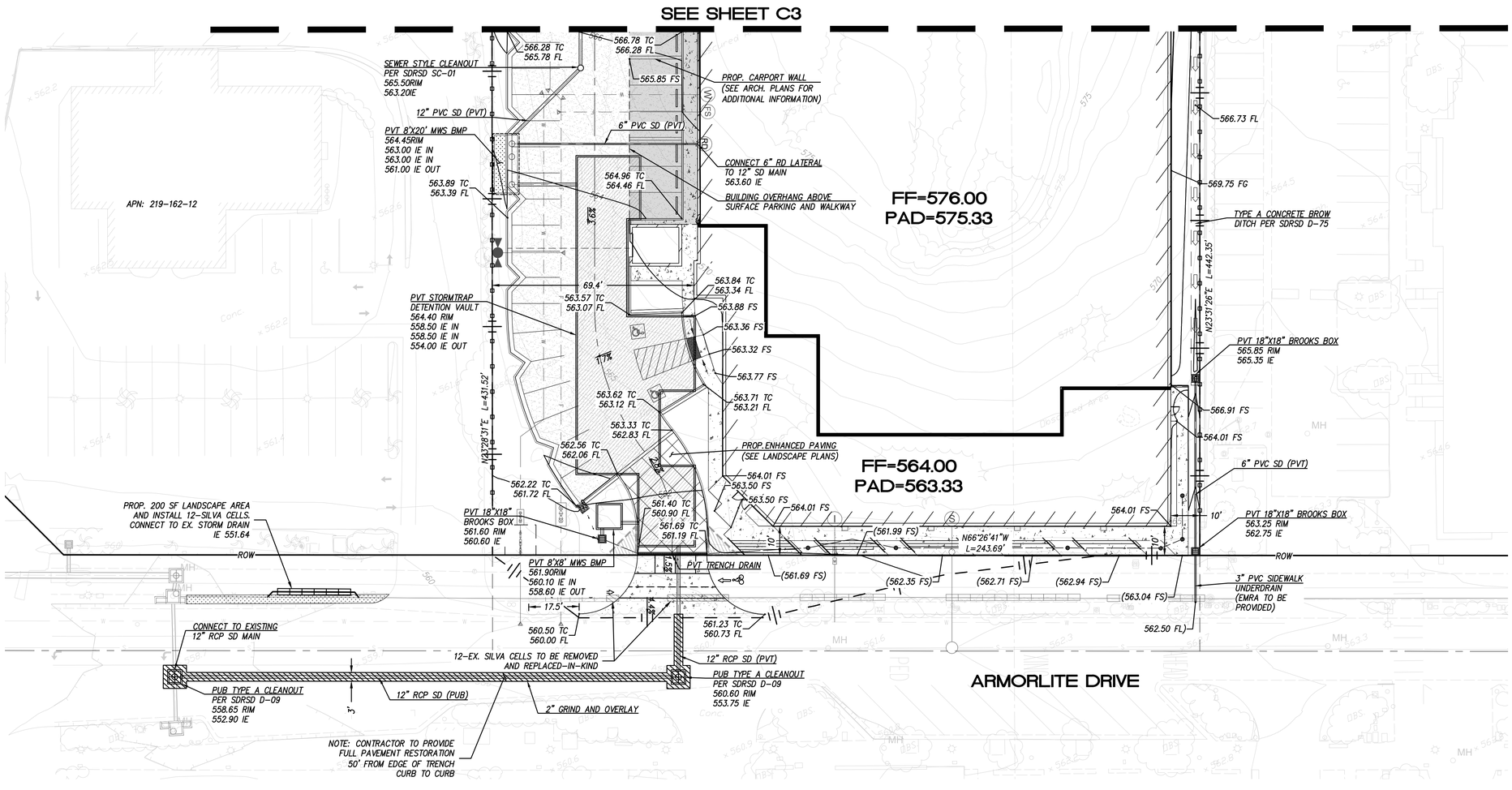
CHECKED BY: JG	DATE: 10/22/24

SHEET
C3



N

0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

latitude 33
PLANNING & ENGINEERING
10731 Treena Street, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER
JEFFREY GIOVANNI POSTL
No. 88332
Exp. 06/30/2025
CIVIL
STATE OF CALIFORNIA

BY	DATE	REVISION
L33	6/5/2023	1ST SUBMITTAL

GRADING AND DRAINAGE PLAN

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

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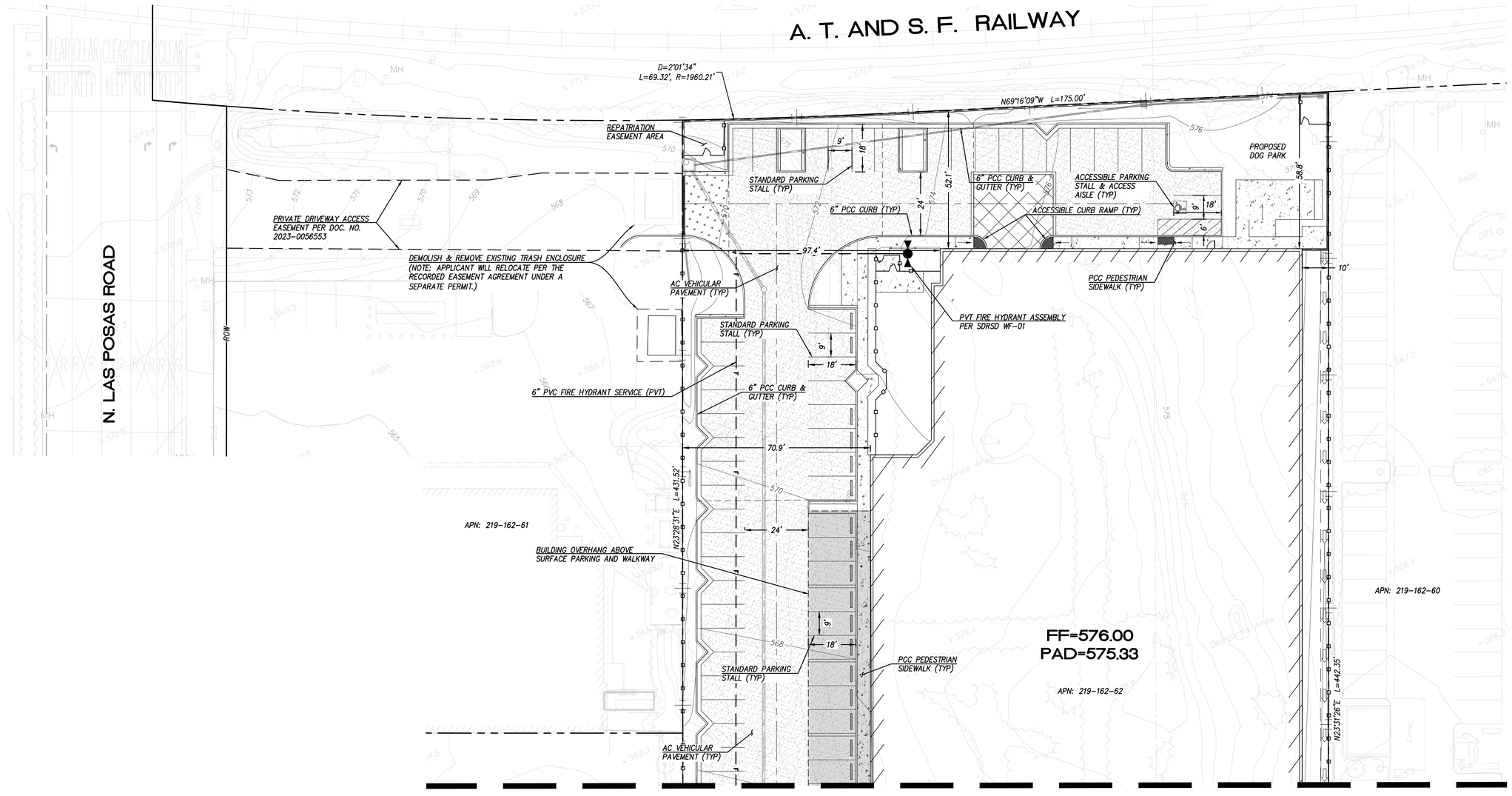
SHEET
C4



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GIOVANNI POSTIL
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IMPROVEMENTS AND UTILITY PLAN

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

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SHEET
C5

N

0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

SEE SHEET C5

STANDARD PARKING STALL (TYP)

6" PVC FIRE HYDRANT SERVICE (PVT)

BUILDING OVERHANG ABOVE SURFACE PARKING AND WALKWAY

6" PCC CURB & GUTTER (TYP)

APN: 219-162-12

AC VEHICULAR PAVEMENT (TYP)

6" PCC CURB (TYP)

4" PVC WATER SERVICE (PVT)

8" PVC FIRE MAIN (PVT)

N23°28'31"E L=431.52'

ACCESSIBLE PARKING STALL & ACCESS AISLE (TYP)

PVT 8" RPDA PER SDRSD WF-05

PVT 4" BACKFLOW PREVENTER PER VWD STANDARD DWG W-13

~30'-6" PERFORATED PIPE REROUTED UNDER SILVA CELLS REMOVE 6" PVC PIPE

PROP. 200 SF PLANTING AREA

INSTALL 12 SILVA CELLS

PROP. 4" METER VAULT VWD EASEMENT

ROW

CONNECT TO EXISTING STORM DRAIN

PUB 4" DOMESTIC WATER METER PER VWD STANDARD DWG W-11

CONNECT TO EXISTING 8" ACP WATER LINE (VWD)

12-EX. SILVA CELLS TO BE REMOVED AND REPLACED-IN-KIND

4" PVC WATER SERVICE (PVT)

DOMESTIC WATER SERVICE POC

FIRE WATER SERVICE POC

6" PVC FIRE SPRINKLER SERVICE (PVT)

PCC PEDESTRIAN SIDEWALK (TYP)

PVT FIRE HYDRANT ASSEMBLY PER SDRSD WF-01

FF=576.00
PAD=575.33

ACCESSIBLE CURB RAMP (TYP)

PCC PEDESTRIAN SIDEWALK (TYP)

FF=564.00
PAD=563.33

N23°31'26"E L=442.35'

SEWER SERVICE POC

N66°26'41"W L=243.69'

6" PVC SEWER LATERAL (PVT)

PUB SEWER CLEANOUT PER VWD STANDARD DWG S-7

6" PVC SEWER LATERAL (PUB)

PUB SEWER MANHOLE PER VWD STANDARD DWG S-1

CONNECT TO EXISTING 8" VCP SEWER LINE (VWD)

CONTINUATION OF MULTI-USE PATH THRU DRIVEWAY

ADA PATH OF TRAVEL FROM ROW

200 SF EX. PLANTING AREA TO BE REMOVED

DRIVEWAY CUT & PCC PAVEMENT APRON PER CITY OF SAN MARCOS MODIFIED RADIUS TYPE DRIVEWAY

~40 LF-4" PERFORATED PIPE TO BE REPLACED WITH 4" PVC

IRRIGATION SERVICE, METER, & BACKFLOW. SEE LANDSCAPE PLANS FOR ADDITIONAL INFORMATION.

ARMORLITE DRIVE

N

0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

latitude 33
PLANNING & ENGINEERING
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IMPROVEMENTS AND UTILITY PLAN

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

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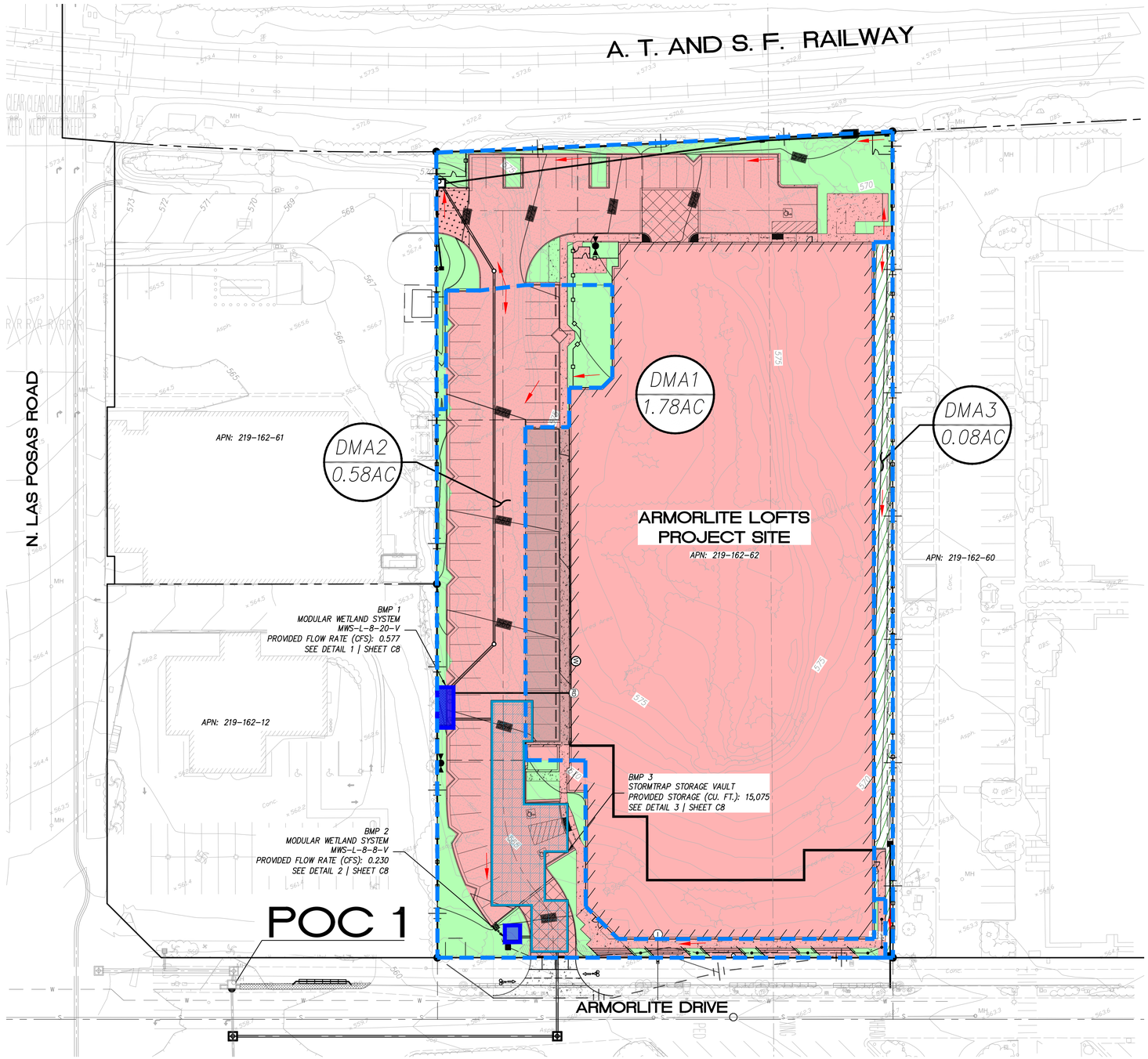

LEGEND

- PROPOSED FLOW PATH
- DMA BOUNDARY
- 250 — PROPOSED CONTOUR
- IMPERVIOUS AREA
- PERVIOUS LANDSCAPE

DMA SUMMARY TABLE				
NAME	AREA (SF)	SOIL TYPE	POST PROJECT SURFACE	
1	71,715	C	IMPERVIOUS AREA	
	5,780	C	PERVIOUS AREA	
2	19,485	C	IMPERVIOUS AREA	
	5,460	C	PERVIOUS AREA	
TOTAL AREA	102,440	TREATED BY	MECHANICALLY TREATED BMP'S	
3	3,640	C	SELF-MITIGATING PERVIOUS AREA	

*** HMP CONTROL BY BMP 3: STORMWATER DETENTION SYSTEM**

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: PROPOSED DRAINAGE CAPTURES POST DEVELOPMENT DRAINAGE ONSITE AND IS CONVEYED VIA PRIVATE STORM DRAIN SYSTEMS BEFORE DISCHARGING INTO THE EXISTING STORM DRAIN SYSTEM ON ARMORLITE DRIVE. SELF-MITIGATING PERVIOUS AREA FROM DMA 3 FOLLOWS EXISTING DRAINAGE PATTERNS AND SHEETFLOW OFF-SITE RESPECTIVELY.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON. SEE FORM I-5 FOR EXPLANATION.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLES.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE FORMS 1-3B AND 1-4 FOR EXPLANATION.

STRUCTURAL BMPS: SHOWN HEREON. SEE DETAILS.

EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: SOIL CLASS TYPE "C"

GROUNDWATER: FREE GROUNDWATER WAS NOT ENCOUNTERED IN THE EXPLORATORY BORINGS PER REPORT BY ALTA CALIFORNIA GEOTECHNICAL, INC., ENTITLED "PRELIMINARY GEOTECHNICAL INVESTIGATION, LOS POSAS ROAD AND ARMORLITE DRIVE CITY OF SAN MARCOS, CALIFORNIA" DATED MARCH 31, 2021 (1-0371). GROUND WATER LEVELS ARE ANTICIPATED TO BE GREATER THAN 100 FEET BELOW THE GROUND SURFACE.

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: **THIS SITE IS NOT LOCATED WITHIN A CCSYA, SEE CCSYA EXHIBIT IN ATTACHMENT 2.**

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON.

EXISTING DRAINAGE: THE EXISTING SITE IS UNDEVELOPED AND IS COMPLETELY SELF-MITIGATING PERVIOUS AREA.

N

0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
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POST CONSTRUCTION BMP PLAN

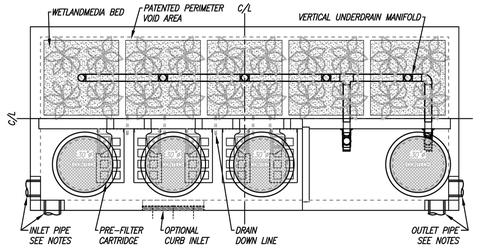
ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS,
CA 92069

L33 PROJECT NUMBER (PN):	1900.00
OTHER PN:	NA
DESIGNED BY: JS	DATE: 10/22/24
DRAWN BY: JS	DATE: 10/22/24
CHECKED BY: JG	DATE: 10/22/24

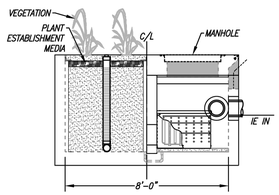
SHEET
C7

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
TREATMENT FLOW (CFS)			
PRETREATMENT LOADING RATE (GPM/SF)			2.1 GPM/SF
WETLAND MEDIA LOADING RATE (GPM/SF)			1.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			(CFS)
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	563.00		
INLET PIPE 2	563.00		
OUTLET PIPE	561.00		
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	564.35	564.35	564.35
SURFACE LOAD	PEDESTRIAN		
NOTES:			

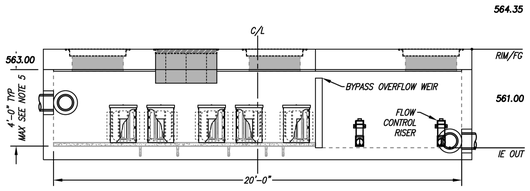
* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



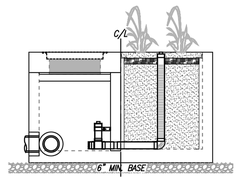
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.

MWS-L-8-20-V

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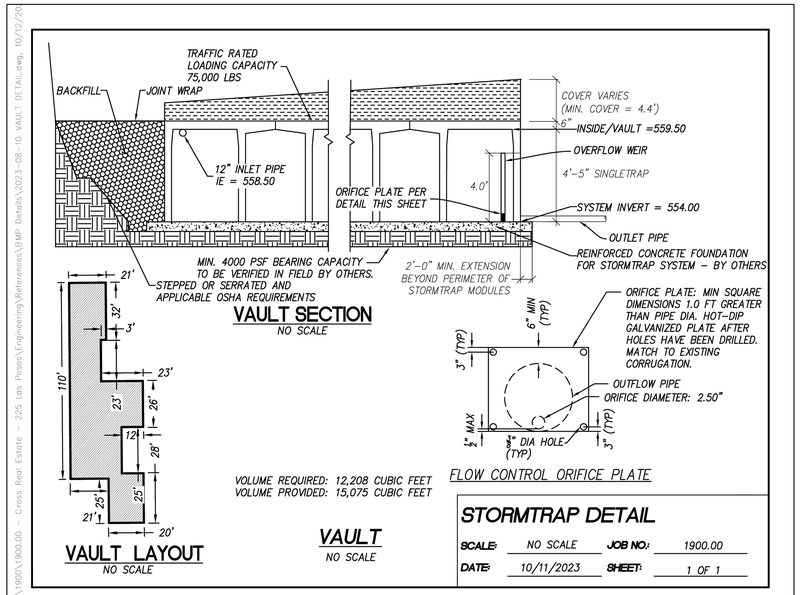
MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

CONTECH ENGINEERED SOLUTIONS LLC — www.ContechES.com

MWS-L-8-20-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

DETAIL 1 – BMP 1: MODULAR WETLAND SYSTEM

NOT TO SCALE



STORMTRAP DETAIL

SCALE: NO SCALE JOB NO.: 1900.00

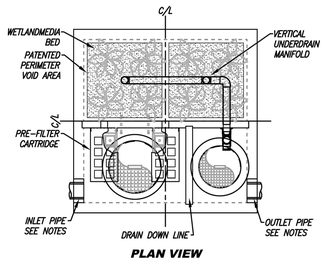
DATE: 10/11/2023 SHEET: 1 OF 1

DETAIL 3 – BMP 3: STORMTRAP STORAGE VAULT

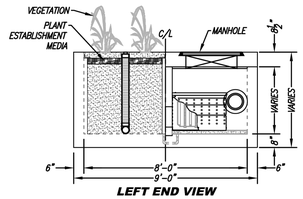
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
FLOW BASED (CFS)			
0.231			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	560.10		
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	558.60		
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	561.85	561.85	561.85
SURFACE LOAD	PEDESTRIAN		
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



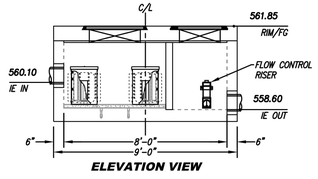
PLAN VIEW



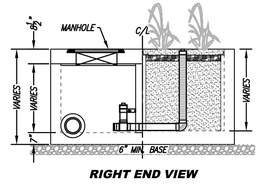
LEFT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.



ELEVATION VIEW



RIGHT END VIEW

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT CONTECH.

TREATMENT FLOW (CFS)	0.231
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

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MWS-L-8-8-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

DETAIL 2 – BMP2: MODULAR WETLAND SYSTEM

NOT TO SCALE

latitude 33
PLANNING & ENGINEERING
1013 Tremona Street, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER — GIOVANNI POSTIL — No. 88332 — Exp. 06/30/2025 — CIVIL — STATE OF CALIFORNIA

BY	DATE	REVISION
LJ33	6/5/2023	1ST SUBMITTAL

POST CONSTRUCTION BMP DETAILS

ARMORLITE LOFTS

225 NORTH LAS POSAS ROAD
SAN MARCOS,
CA 92069

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SHEET

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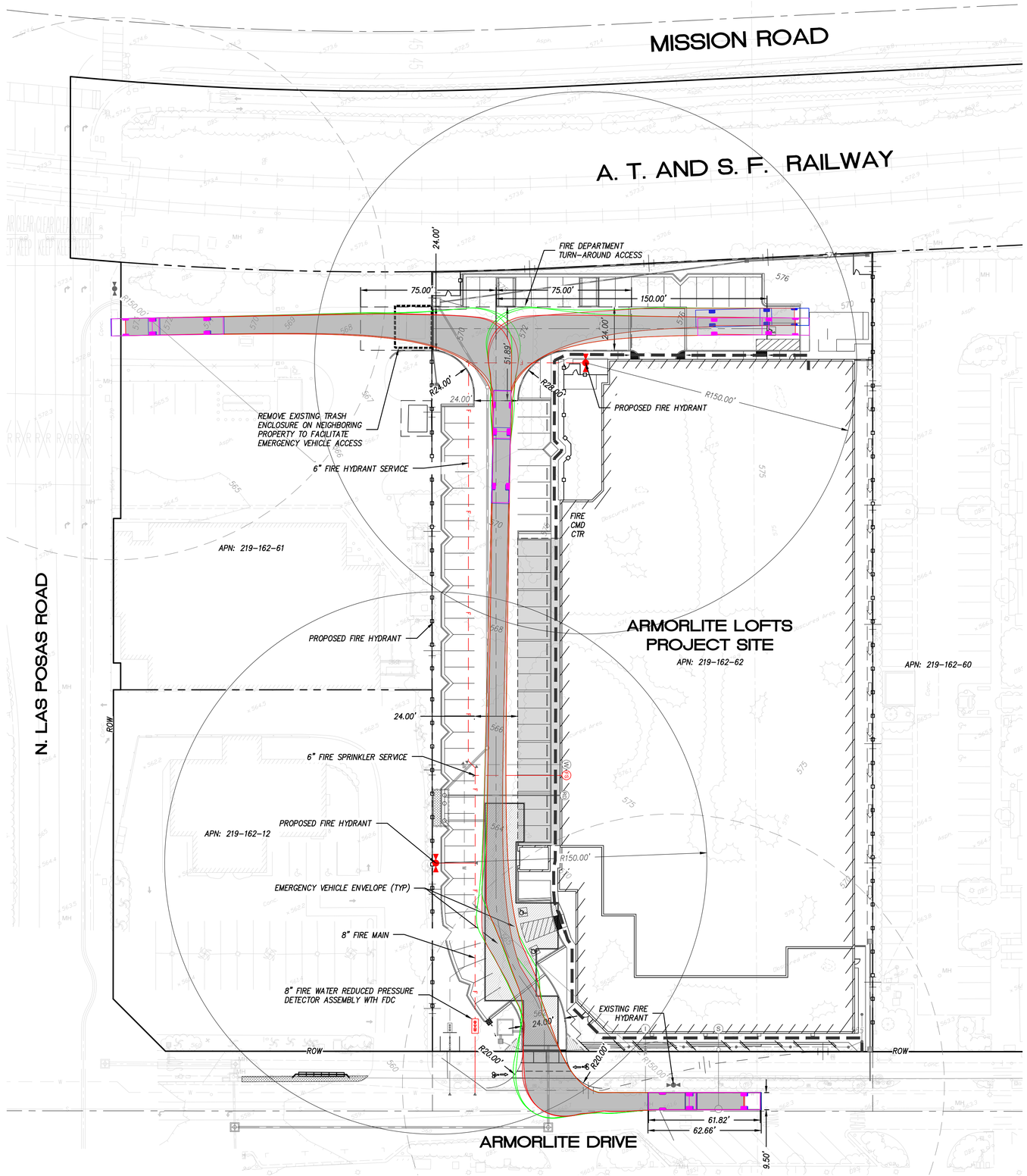
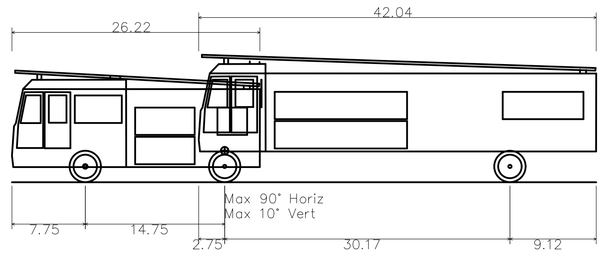
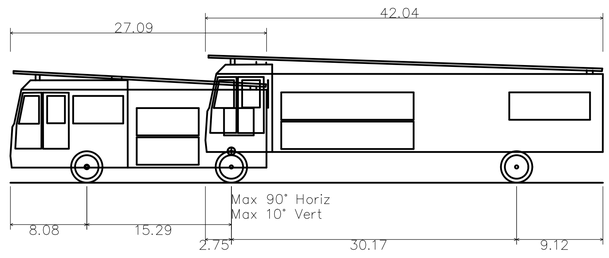


FIRE TRUCK VEHICLE TRACKING DETAILS



San Marcos Fire Department Tiller Truck	
Overall Length	61.790ft
Overall Width	9.500ft
Overall Body Height	13.479ft
Min Body Ground Clearance	1.597ft
Track Width	9.500ft
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	31.080ft



San Marcos Fire Department Pumper Truck	
Overall Length	62.660ft
Overall Width	9.500ft
Overall Body Height	13.479ft
Min Body Ground Clearance	1.597ft
Track Width	9.500ft
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	33.000ft

LEGEND

PATH OF TRAVEL

SAN MARCOS FIRE DEPARTMENT TILLER TRUCK

SAN MARCOS FIRE DEPARTMENT PUMPER TRUCK

N

0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
10731 Treena Street, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER
GIOVANNI POSTIGLIONE
No. 68332
Exp. 06/30/2025
CIVIL
STATE OF CALIFORNIA

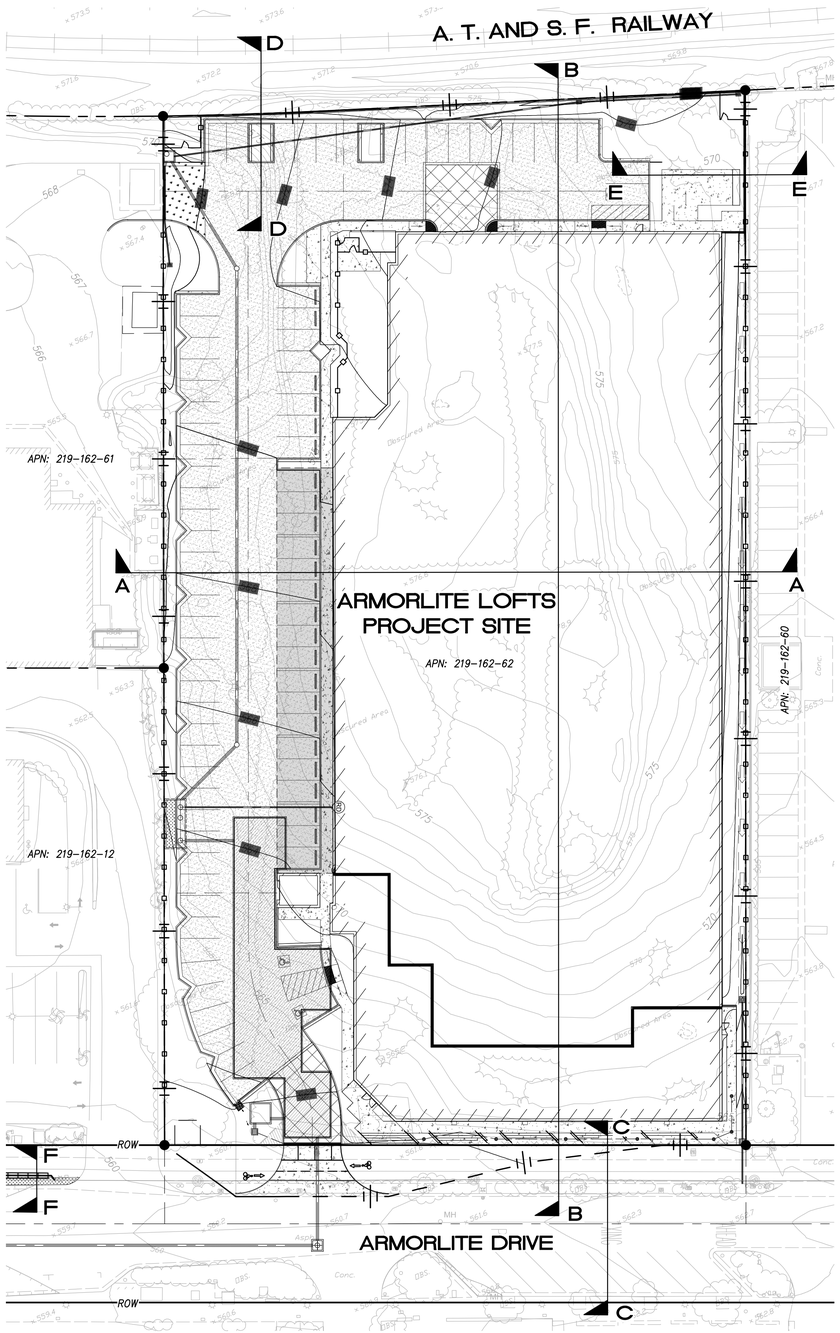
DATE	REVISION	BY
6/5/2023	1ST SUBMITTAL	L33

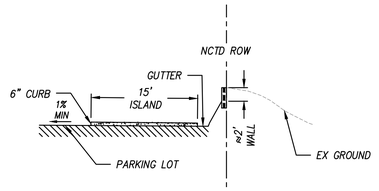
SITE CIRCULATION PLAN

ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

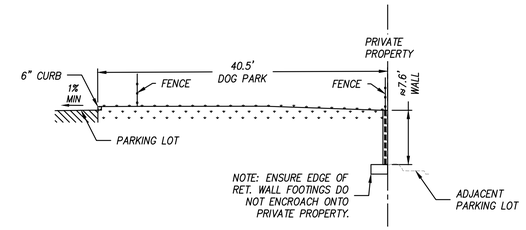
L33 PROJECT NUMBER (PN): 1900.00	
OTHER PN: NA	
DESIGNED BY: JS	DATE: 10/22/24
DRAWN BY: JS	DATE: 10/22/24
CHECKED BY: JG	DATE: 10/22/24

SHEET
C9





SECTION D-D
NOT TO SCALE



SECTION E-E
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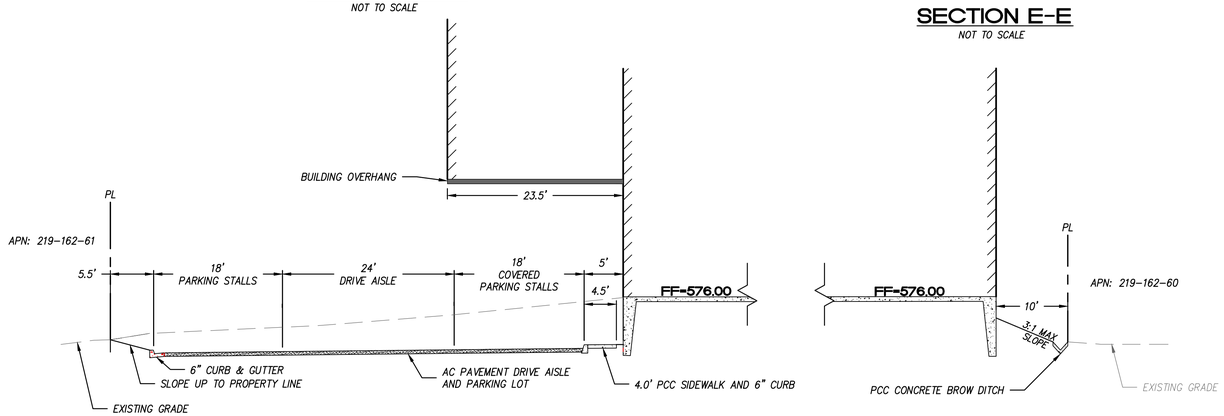

SECTION A-A
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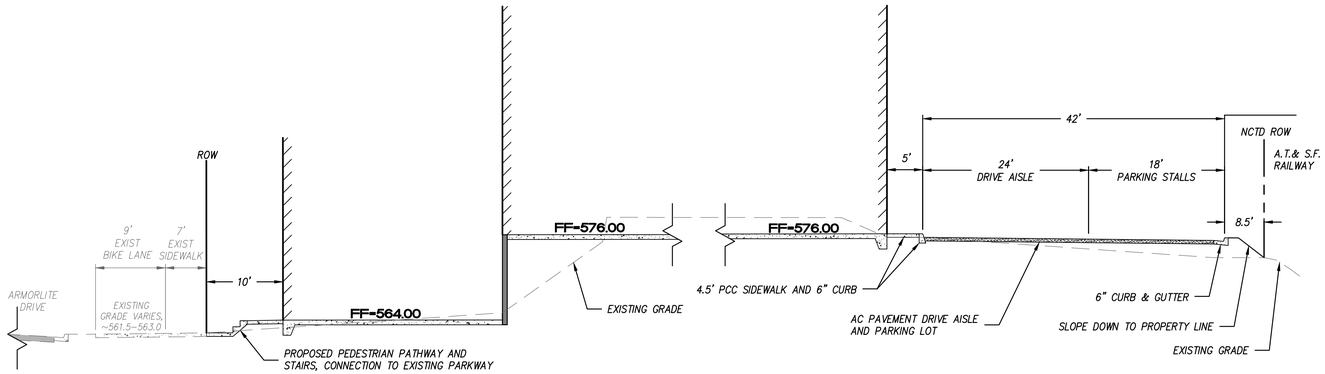
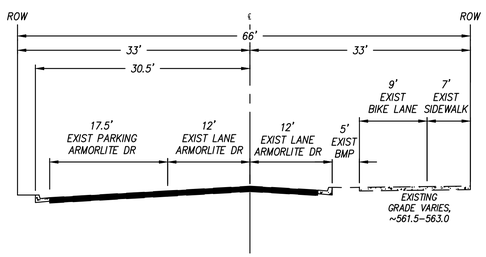
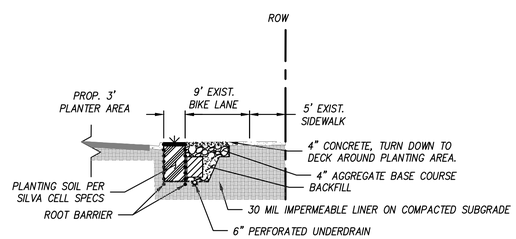


SECTION B-B
NOT TO SCALE



SECTION C-C
NOT TO SCALE



SECTION F-F
NOT TO SCALE

N

0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
10731 Treena Street, San Diego, CA 92131
Tel 858.751.0633

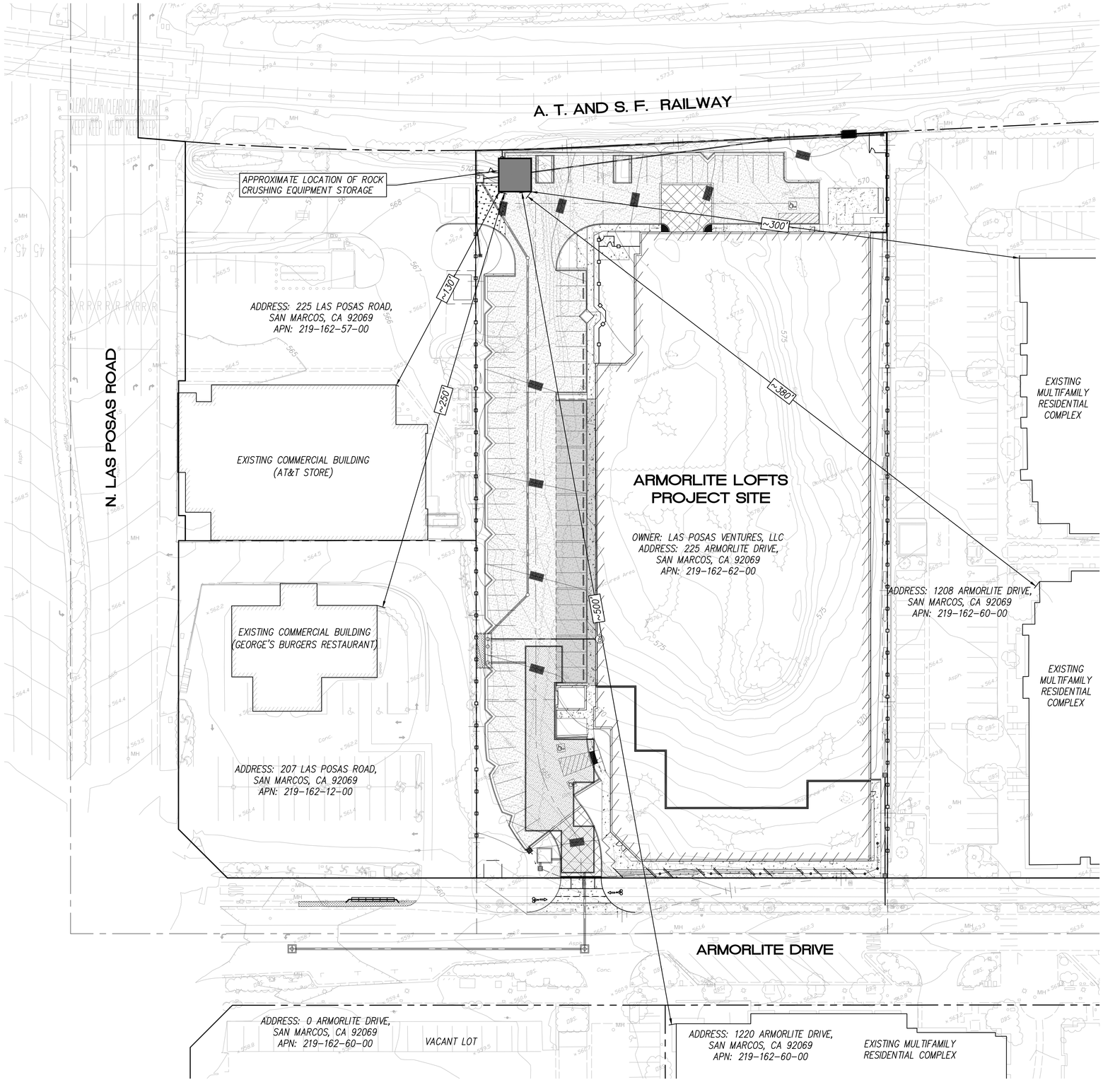
REGISTERED PROFESSIONAL ENGINEER
GIOVANNI POSTIL
No. 86332
Exp. 06/30/2025
CIVIL
STATE OF CALIFORNIA

DATE	REVISION	BY
6/5/2023	1ST SUBMITTAL	L33

SITE SECTION PLAN
ARMORLITE LOFTS
225 NORTH LAS POSAS ROAD
SAN MARCOS, CA 92069

L33 PROJECT NUMBER (PN):	1900.00
OTHER PN:	NA
DESIGNED BY: JS	DATE: 10/22/24
DRAWN BY: JS	DATE: 10/22/24
CHECKED BY: JG	DATE: 10/22/24

SHEET
C10



ROCK CRUSHING ACTIVITIES

PER GEOTECHNICAL ANALYSIS OF THE ARMORLITE LOFTS PROJECT SITE, EXISTING DEPOSITS OF GRANITE FORMATION UNDERLIE A SIGNIFICANT PORTION OF THE PROPERTY. AS SUCH, ROCK CRUSHING EQUIPMENT WILL BE REQUIRED DURING PROPOSED GRADING ACTIVITIES TO PROCESS THE EXCAVATED GRANITE MATERIALS FOR REMOVAL/TRANSPORT.

THIS PROJECT WILL UTILIZE APPROPRIATE SOUND AND DUST MITIGATIVE MEASURES DURING OPERATION OF ROCK CRUSHING EQUIPMENT TO AVOID IMPACTS TO THE SURROUNDING COMMUNITY.

ROCK CRUSHING EQUIPMENT WILL BE STORED IN A LOCATION ONSITE THAT IS MAXIMALLY DISTANT FROM NEIGHBORING PROPERTIES WITH EXISTING USES THAT ARE MORE SENSITIVE TO NOISE IMPACTS (SEE SITE PLAN THIS SHEET).

N

0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
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REGISTERED PROFESSIONAL ENGINEER
GIOVANNI POSTIL
No. 88332
Exp. 06/30/2025
CIVIL
STATE OF CALIFORNIA

DATE	REVISION	BY
6/5/2023	1ST SUBMITTAL	L33

ROCK CRUSHING EQUIPMENT PLAN

ARMORLITE LOFTS

225 NORTH LAS POSAS ROAD SAN MARCOS, CA 92069

L33 PROJECT NUMBER (PN): 1900.00			
OTHER PN: NA			
DESIGNED BY:	JS	DATE:	10/22/24
DRAWN BY:	JS	DATE:	10/22/24
CHECKED BY:	JG	DATE:	10/22/24

SHEET

C11