County of San Diego

Stormwater Quality Management Plan (SWQMP)
For Priority Development Projects (PDPs)
Use for all PDPs (see Storm Water Intake Form, Part 4)

Priority Development Project

Project Information	**Development type** ☒ New development ☐ Redevelopment	
Project Name	Passerelle Parcel 1	
Project Address	(Vacant) Horse Ranch Creek Road, Fallbrook, CA 92028	
Assessor's Parcel # (APN)	108-120-61 & 63	
Permit # / Record ID	PDS2021-SPA-21-001	
Project category (select one)	☐ Commercial	☐ Minor subdivision*
	☐ Industrial	☒ Major subdivision*
	☐ Single family residential lot	☐ Multi-family residential*
	*If residential, is a Homeowners Association (HOA) proposed? ☒ Yes ☐ No	

Project Applicant / Project Proponent			
Name	Monty McCullough, Passerelle, LLC		
Address	10531 4S Commons Dr # 700, San Diego, CA 92127		
Phone	(858) 431-9622	**Email:**	monty@mddhomes.com

SWQMP Preparer			
Name	William O'Gorman		
Company (if applicable)	REC Consultants, Inc.		
Address	2970 5th Ave, Suite 340, San Diego, CA 92103		
Phone	(619)232-9200 x107	**Email:**	william@rec-consultants.com
PE Number (if applicable)	88286		

Preparer's Certification

I understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the County of San Diego BMP Design Manual. The BMP Design Manual is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Order No. R9-2015-0100) requirements for storm water management.

This SWQMP is intended to comply with applicable requirements of the BMP Design Manual. I certify that it 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 SWQMP by County staff is confined to a review and does not relieve me as the person in charge of overseeing the selection and design of storm water BMPs for this project, of my responsibilities for project design.

Signature William O'Gorman
Digitally signed by William O'Gorman
DN: cn=William O'Gorman, o=REC Consultants, Inc., ou, email=William@rec-consultants.com, c=US
Date: 2023.08.31 14:37:55 -07'00'

Date 8-22-23

COUNTY ACCEPTED

SWQMP Approved By:

Approval Date:

**** NOTE* Approval does not constitute compliance with regulatory requirements.***

Scope of SWQMP Submittal (Required)

Select the option that describes the scope of this SWQMP Submittal. Document your selection as indicated.

SWQMP Scope	Required Documentation
☐ ***a. SWQMP addresses the entire project***	No additional documentation.
☐ ***b. SWQMP implements requirements of an earlier master SWQMP submittal***	Include a copy of the previous submittal as **Attachment 4**.
☐ ***c. First of multiple SWQMP submittals***	Identify below the elements addressed in this submittal and in future submittals.

(1) Elements addressed in current submittal (streets, common areas, first project phase, etc.):

(2) Elements to be addressed in future submittal(s) (individual lots, future project phases, etc.):

Submittal Record: List the dates of SWQMP and plan submittals and updates. Briefly describe key changes from previous versions. If responding to plan check comments, note this in the entry and attach the responses as applicable.

No.	Date	Summary of Changes
Preliminary Design / Planning / CEQA		
1	3/1/21	Initial Submittal
2	2/1/22	Addressed SWQMP Comments Dated 11/4/21
3	9/30/22	Addressed SWQMP Comments Dated 6/27/22
4	8/22/23	Addressed SWQMP Comments Dated 4/05/23
Final Design		
1		Initial Submittal
2		
3		
Plan Changes		
1		Initial Submittal
2		
3		

General Directions

Note: These directions may be omitted from the print version of the SWQMP submittal.

① Scope of SWQMP Submittal and Submittal Record (inside front cover)

Use the ***Submittal Scope*** table to document the scope of activities covered under this SWQMP Form. Select one of the three options presented.

- ***SWQMP addresses the entire project***. If this SWQMP form addresses the entire project from start to finish, additional documentation of the project scope is not required.
- ***SWQMP implements requirements of an earlier master SWQMP submittal***. If this SWQMP Form implements requirements identified in an earlier master SWQMP Form, documentation of those earlier requirements must be provided. Include a copy of the previous submittal as **Attachment 4**.
- ***First of multiple SWQMP submittals***. If this is the first of multiple SWQMP submittals, use the spaces provided under Part c to identify and briefly describe which project elements are addressed in this submittal and which ones will be addressed in future submittals. For example, this PDP addresses only streets and roads, but individual lots will be documented in future submittals.

Use the ***Submittal Record*** table to list the dates of any updates to the SWQMP or construction plans. Briefly describe key changes from previous versions. If responding to plan check comments, note this in the entry and attach the responses as applicable.

② PDP SWQMP Submittal Checklist

The checklist on Page 1 summarizes the tables and attachments to be included with this PDP SWQMP submittal. It should be filled out after completing the remainder of the form. Tables and attachments with boxes already checked (☒) are required for all projects. All tables are required. The applicability of attachments not already checked will be identified during the completion of this form.

③ Attachment 1: Stormwater Intake Form

Submit a copy of your completed ***Storm Water Intake Form*** as **Attachment 1**.

④ Tables 1, 2, and 3: Baseline Site Design and Source Control BMPs

Table 1 Completion: Complete **Table 1** to document existing and proposed site features and the BMPs to be implemented for them. All BMPs must be implemented ***where applicable and feasible***. Applicability is generally assumed if a feature exists or is proposed.

Table 2 Completion: Table 2 is not required for Small Residential Projects. Applicants should check the box at the top of the table to confirm it does not apply.

Small Residential Projects are those requiring *either:* a Building Permit, Minor Residential Grading Permit, or Site Plan Permit for a single family home; *or* a Tentative Parcel Map Permit for up to 4 single family homes and a remainder parcel.

All other projects must complete **Table 2** to identify applicable requirements for documenting pollutant-generating sources/ features and source control BMPs.

BMPs must be implemented for **Table 1** and **2** features ***where feasible***. Leaving the box for a BMP unchecked means it will not be implemented (either partially or fully) either because it is inapplicable or infeasible. Explanations must be provided in **Table 3**. Tables 1 and 2 both provide specific instructions on when explanations are required.

⑤ Attachment 5: Existing Site and Drainage Description

Complete **Attachment 5** to provide a description of (1) the existing pre-development condition of the site, and (2) existing and proposed drainage conditions for the site. If required, include a copy of the site Drainage Study with Attachment 5.

⑥ Structural Performance Standards

Determine which Structural Performance Standards apply to the PDP, where they apply, and which compliance strategies you will use to satisfy them. Record your selections in **Table 4** as follows.

Table 4, Part A.1, Selection of Standards: First select the standards that apply to the project.

- *Pollutant control plus hydromodification* — Select if the PDP is not exempt from hydromodification management requirements. It must satisfy both the Pollutant Control Performance Standard (BMPDM Section 2.2) and the Hydromodification Management Performance Standard (BMPDM Section 2.3).
- *Pollutant control only* — Select if the PDP is exempt from hydromodification management requirements per BMPDM Section 6.1. Document the exemption in **Attachment 9**.

Table 4, Part A.2, Application of Standards: Next indicate where on the site the standards apply.

- If this is a **New Development Project**, the standards apply to all impervious surfaces on the site.
- If this is a **Redevelopment Project**, their applicability will depend on the ratio of created or replaced impervious areas to existing impervious areas (see BMPDM Section 1.7). Complete the calculations in the table to determine your obligation. The **percent (%) impervious created or replaced (c)** is determined by dividing the **impervious area created or replaced (b)** by the **existing impervious area (a)** and multiplying the result by 100.
  - **If c is 50% or more**: The standards apply to all impervious surfaces on the site (a + b).
  - **If c is less than 50%**: The standards apply only to created or replaced impervious surfaces (b only).

Table 4, Part B.1: Summary of Required Attachments (1 through 5)

Use this part of the table to summarize which of Attachments 1 through 5 will be included with the SWQMP submittal. If you are completing an **electronic version** of this form, your selections will be automatically recorded based on your previous input. If you are completing a **hard copy** of this form, you must manually select Attachments 3 and 4 as applicable (see pages 4 and 6). Note that Attachments 1,2, and 5 are required for all projects.

Table 4, Part B.2: Selection of Compliance Strategies

Complete Part B.2 to document which compliance options will be used to satisfy the applicable standards for the site. Before doing so, you must determine which option will be used for each DMA. The following four potential design options are presented in detail in BMPDM Chapters 5 and 6.

1. **Self-mitigating DMAs** (BMPDM Section 5.2.1)
2. **De Minimis DMAs** (BMPDM Section 5.2.2)
3. **Self-retaining DMAs** (BMPDM Section 5.2.3)
4. **Structural BMPs**
   - Pollutant Control BMPs (BMPDM Sections 5.4)
   - Hydromodification BMPs (BMPDM Chapter 6)
   - Alternative Compliance Project (BMPDM Section 1.8)

Only one compliance option may be used per individual DMA. Regardless of which option is selected for any DMA, it must fully satisfy the applicable standard(s) determined in Part A.1.

On the left side of Part B, check the applicable boxes for each compliance option to be used.

⑦ Summary of Additional Required Attachments (6 through 12)

You must complete and submit each attachment identified for the compliance options selected. Applicable attachments are listed to the right of each compliance option. If you are completing an **electronic version** of this form, the required attachments for each design option will automatically be selected when you choose the compliance option. As noted above, these selections will also be recorded on the PDP SWQMP Submittal Checklist (Page 1). If you are completing a **hard copy** of this form, you will need to manually check the boxes for each applicable attachment on both pages.

Note that Attachment 9 (Critical Coarse Sediment Yield Areas) is required for all PDPs. If the PDP is exempt from hydromodification requirements, the exemption must be documented in Attachment 9.

⑧ Table 5: Critical Coarse Sediment Yield Area Requirements

Complete **Table 5** to select a compliance pathway for addressing Critical Coarse Sediment Yield Area (CCSYA) requirements for the PDP. See BMPDM Appendix H for additional description of requirements and options. Document Table 5 selections, including hydromodification management exemptions, in **Attachment 9**.

⑨ Tables 6 and 7: Temporary Construction Phase BMPs

Complete **Table 6** to document the minimum construction BMPs to be implemented for the project. Each BMP must be implemented ***where applicable and feasible***. At least one BMP must be selected for each construction activity listed in the table (except Erosion Control for Disturbed Slopes, which requires one BMP per season).

If applicable, use **Table 7** to describe why BMPs not selected in Table 6 are either infeasible or are only partially feasible. Justifications must be provided for all construction activity types for which NO BMPs were selected. If requested by County staff, also justify why specific individual BMPs were not selected.

⑩ Attachment 2: DMA Exhibits and Construction Plans

Exhibits and construction plan sets incorporating all applicable site features, activities, and BMPs identified in **Tables 1, 2, and 6** must be submitted as **Attachment 2 (DMA Exhibits and Construction Plan Sheets)**. See the Attachment 2 cover sheet for additional instructions.

PDP SWQMP Submittal Checklist

SWQMP Tables: All of the tables below must be completed.

SWQMP Attachments[1]: Use the checklist below to identify which attachments will be included with this submittal. Attachments with boxes already checked (☒) are required for all projects. The applicability of other attachments will be determined upon completing this form.

☒ Attachment 1: Storm Water Intake Form

☒ Attachment 2: DMA Exhibits and Construction Plan Sheets

☐ Attachment 3: Reserved for Future Use

☐ Attachment 4: Previous SWQMP Submittals

☒ Attachment 5: Existing Site and Drainage Description

☐ Attachment 6: Documentation of DMAs without Structural BMPs

☒ Attachment 7: Documentation of DMAs with Structural Pollutant Control BMPs

☒ Attachment 8: Documentation of DMAs with Structural Hydromodification Management BMPs

☒ Attachment 9: Management of Critical Coarse Sediment Yield Areas

☒ Attachment 10: BMP Installation Verification Form

☒ Attachment 11: BMP Maintenance Agreements and Plans

☒ Attachment 12: Documentation of Alternative Compliance Projects (ACPs)

After completing the remainder of this form, check the applicable SWQMP Attachment boxes to summarize your selections.

[1] All SWQMP Attachments are available at www.sandiego.gov/stormwater under the Development Resources tab, Submittal Templates.

Table 1 – Baseline BMPs for Existing and Proposed Site Features

A. BMPs for Existing Natural Site Features (See Fact Sheet BL-1)

1. Check the boxes below for each existing feature on the site.

2. Select the BMPs to be implemented for each identified feature. Explain why any BMP not selected is infeasible in Table 3.

	Conserve natural features (SD-G)	Provide buffers around waterbodies (SD-H)
☐ Natural waterbodies	☐	☐
☐ Natural storage reservoirs & drainage corridors	☐	---
☐ Natural areas, soils, & vegetation (incl. trees)	☐	---

B. BMPs for Common Impervious Outdoor Site Features (See Fact Sheet BL-2)

1. Check the boxes below for each proposed feature.

*2. Select the BMPs to be implemented for each proposed feature. If neither BMP **SD-B** nor **SD-I** is selected for a feature, explain why both BMPs are infeasible in Table 3.*

	a. Direct runoff to pervious areas (SD-B)	b. Construct surfaces from permeable materials (SD-I)	c. Minimize the size of impervious areas
☒ Streets and roads	☐	☐	☒ *Check this box to confirm that all impervious areas on the site will be minimized where feasible.*
☒ Sidewalks & walkways	☒	☐	
☒ Parking areas & lots	☒	☒	
☒ Driveways	☐	☒	*If this box is not checked, identify the surfaces that cannot be minimized in Table 3, and explain why it is infeasible to do so.*
☒ Patios, decks, & courtyards	☒	☒	
☐ Hardcourt recreation areas	☐	☐	
☐ Other:	☐	☐	

C. ☒ **BMPs for Rooftop Areas:** *Check this box if rooftop areas are proposed and select at least one BMP below.* **(See Fact Sheet BL-3)**

If no BMPs are selected, explain why they are infeasible in Table 3.

1. Direct runoff to pervious areas (SD-B)	2. Install green roofs (SD-C)	3. Install rain barrels (SD-E)
☒	☐	☐

D. ☒ **BMPs for Landscaped Areas:** *Check this box if landscaping is proposed and select at least one BMP below.* **(See Fact Sheet BL-4)**

If no BMPs are selected, explain why they are infeasible in Table 3.

1. Sustainable Landscaping (SD-K)
☒

Note: All features and BMPs must be shown on applicable construction plans. See applicable Fact Sheets in Appendix C of the BMP Design Manual for additional information.

Note: Use Table 3 to explain BMP infeasibility or inapplicability, or to describe features or BMPs not listed in this table. Additional explanation may be required by the County.

Table 2 – Baseline BMPs for Pollutant-generating Sources

☐ If this is a **Small Residential Project**, check this box and skip the rest of this table.

A. Management of Stormwater Discharges

1. Identify all proposed outdoor work areas below (☐ *Check here if none are proposed*)	**2. Which BMPs will be used to prevent materials from contacting rainfall or runoff?** (See Fact Sheet BL-5) *(Select all feasible BMPs for each work area[2])*			**3. Where will runoff from the work area be routed?** (See Fact Sheet BL-6) *(Select one or more option for each work area)*			
	Overhead covering (rooftops, etc.) (SC-A)	**Separation of flows from adjacent areas (berms, etc.) (SC-B)**	**Wind protection (screens, etc.) (SC-C)**	**Sanitary sewer[3] (SC-D)**	**Containment system (SC-E)**	**Stormwater S-BMP or SSD-BMP[4]**	**Other[5]**
☒ Trash & Refuse Storage	☒	☐	☒	☐	☒	☐	☒
☐ Materials & Equipment Storage	☐	☐	☐	☐	☐	☐	☐
☐ Loading & Unloading	☐	☐	---	☐	☐	☐	☐
☐ Fueling	☐	☐	---	☐	☐	☐	☐
☐ Maintenance & Repair	☐	☐	---	☐	☐	☐	☐
☐ Vehicle & Equipment Cleaning	☐	☐	---	☐	☐	☐	☐
☐ Other:	☐	☐	---	☐	☐	☐	☐

B. Prevention of Non-stormwater Discharges (See Fact Sheet BL-7)

Select one option for each feature below:

• **Storm drain inlets and catch basins …**	☐ are not proposed	☒ will be labeled with stenciling or signage to discourage dumping **(SC-F)**
• **Educational BMP Signage …**	☐ are not proposed	☒ will be labeled with educational signage for BMP **(SC-G)**
• **Interior work surfaces, floor drains, & sumps …**	☒ are not proposed	☐ will not discharge directly or indirectly to the MS4 or receiving waters
• **Drain lines (e.g., air conditioning, boiler, etc.) …**	☐ are not proposed	☒ will not discharge directly or indirectly to the MS4 or receiving waters
• **Fire sprinkler test water …**	☐ are not proposed	☒ will not discharge directly or indirectly to the MS4 or receiving waters

Note: All outdoor features and BMPs in this table must be shown on applicable construction plans. See applicable Fact Sheets in Appendix C of the BMP Design Manual for additional information. **Note:** Use Table 3 to explain BMP infeasibility or inapplicability, or to describe features or BMPs not listed in this table. Additional explanation may be required by the County.

[2] Each BMP is required where feasible. If none are selected for any feature, explain why they are infeasible in Table 3.

[3] Separate wastewater agency approvals may be required.

[4] Structural Treatment Control BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) may not receive discharges from work areas that concentrate pollutants in a manner that will impair their functioning. Discharges from the proposed work area must also be included in DCV calculations for the applicable BMP.

[5] Describe other proposed options for managing stormwater discharges in Table 3.

Table 3 – Explanations and Justifications for Table 1 and 2 Baseline BMPs

☒ **Check here if no explanations or justifications for Table 1 or 2 BMPs are required.**

- **Required Justifications**: Provide explanations of BMP inapplicability and/or infeasibility as indicated per Tables 1 and 2.
- **If Requested**: Justify why specific BMPs will not be implemented or will only be partially implemented.
- **Additional Explanation**: Describe any proposed features and/or BMPs not listed in Tables 1 or 2.

BMP-Feature Combination		Explanation
Feature	Group 1	Not applicable because there are no natural water bodies, storage reservoirs, or areas, soils, & vegetation in the area.
BMP	All	
Feature	Water Features	Not Applicable
BMP	All	
Feature	Streets and Roads	It is infeasible to use permeable materials and to disperse impervious areas for the streets and roads.
BMP	All	
Feature	Hardcourt Recreation Areas	Not Applicable
BMP	All	
Feature		
BMP		
Feature		
BMP		
Feature		
BMP		

Table 4: DMA Structural Compliance Strategies and Documentation

Part A – Selection and Application Structural Performance Standards

1. Selection of Standards (select one; see BMPDM Section 6.1)

☒ a. Pollutant control + hydromodification ☐ b. Pollutant control only (project is exempt from hydromodification requirements)

2. Application of Structural Performance Standards (select one; see BMPDM Section 1.7)

☒ **New Development Projects:** Standards apply to all impervious surfaces.

☐ **Redevelopment Projects:** Complete the calculations below. Select the applicable scenario based on the results.

a. Existing impervious area (ft²)	b. Impervious area created / replaced (ft²)	c. % Impervious created / replaced [(b/a)*100]

☐ *Scenario 1: c is 50% or more*: Performance standards apply to all impervious surfaces (a + b).

☐ *Scenario 2: c is less than 50%*: Performance standards apply only to created or replaced impervious surfaces (b only).

Part B – Compliance Strategies and Required Attachments

1.*Complete and submit each of the applicable attachments on the right.*

Att. 1	Att. 2	Att. 3	Att. 4	Att. 5
Storm Water Intake Form ☒	DMA Exhibits and Construction Plan Sheets ☒	N/A ☐	Previous SWQMP Submittals (see inside cover) ☐	Existing Site and Drainage Description ☒

2. *Indicate each compliance strategy below that will be used for one or more DMAs on the site.*

	Att. 6 DMAs without Structural BMPs	Att. 7 DMAs w/ Structural Pollutant Control BMPs	Att. 8 DMAs w/ Structural Hydromod. BMPs	Att. 9 Critical Coarse Sediment Yield Areas	Att. 10 BMP Installation Verification Form	Att. 11 Maintenance Agreements/ Plans	Att. 12 Alternative Compliance Projects
☒Self-mitigating DMAs (BMPDM Section 5.2.1)	☒			☒			
☐De Minimis DMAs (BMPDM Section 5.2.2)	☐			☐			
☐Self-retaining DMAs (BMPDM Section 5.2.3)	☐			☐	☐		
Structural BMPs (select all that apply)							
☒Pollutant Control BMPs (BMPDM Section 5.4)		☒		☒	☒	☒	
☒Hydromodification Control BMPs (BMPDM Chapter 6)			☒	☒	☒	☒	
☐Alternative Compliance Project (BMPDM Section 1.8)				☐	☐	☐	☐

- *Attachments 1, 2, and 5 are required for all projects.*

Table 5: Critical Coarse Sediment Yield Area (CCSYA) Requirements

- Identify one applicable compliance pathway for the PDP below.
- Document your selection in **Attachment 9**.

A. Hydromodification Management Exemption (BMPDM Sections 1.6 and 6.1)

☐ **PDP is Exempt from Hydromodification Management Requirements**

Select if hydromodification management exemption was selected in Table 4 Part A.1.

B. Watershed Management Area (WMAA) Mapping (BMPDM Appendix H.1.1.2)

☒ **WMAA mapping demonstrates the following:**

a. <5% of potential onsite CCYSAs will be impacted (built on or obstructed)

b. All potential upstream offsite CCYSAs will be bypassed

C. Resource Protection Ordinance (RPO) Methods (BMPDM Appendix H.1.1.1)

☐ **RPO Scenario 1: PDP is subject to and in compliance with RPO requirements**

a. Project requires one or more discretionary permits (RPO applicability is confirmed during discretionary review)

b. Onsite AND upstream offsite CCSYAs will be avoided and/or bypassed

☐ **RPO Scenario 2: PDP is entirely exempt/not subject to RPO requirements**[6]

a. Project does not require discretionary permits

b. Project will bypass all upstream offsite CCSYAs (no requirements for onsite CCSYAs)

D. No Net Impact Analysis (BMPDM Appendix H.4)

☐ **Project demonstrates no net impact to receiving waters**

[6] Does not include PDPs utilizing exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3).

Table 6 –Minimum Construction Stormwater BMPs

Minimum Required BMPs by Activity Type Select all applicable activities and at least one BMP for each.	References Caltrans[7]	 County of San Diego
☒ **Erosion Control for Disturbed Slopes** (choose at least 1 per season)		
☐ Vegetation Stabilization Planting[8] (Summer)	SS-2, SS-4	
☒ Hydraulic Stabilization Hydroseeding (Summer)	SS-4	
☒ Bonded Fiber Matrix or Stabilized Fiber Matrix[9] (Winter)	SS-3	
☐ Physical Stabilization Erosion Control Blanket (Winter)	SS-7	
☒ **Erosion control for disturbed flat areas (slope < 5%)**		
☐ County Standard Lot Perimeter Protection Detail	SC-2	PDS 659[10]
☐ Use of Item A erosion control measures on flat areas	SS-3, SS-4, SS-7	
☐ County Standard Desilting Basin (must treat all site runoff)	SC-2	PDS 660[11]
☒ Mulch, straw, wood chips, soil application	SS-6, SS-8	
☐ **Energy dissipation (required to control velocity for concentrated runoff or dewatering discharge)**		
☐ Energy Dissipater Outlet Protection	SS-10	RSD D-40[12]
☒ **Sediment control for all disturbed areas**		
☒ Silt Fence	SC-1	
☐ Fiber Rolls (Straw Wattles)	SC-5	
☒ Gravel & Sand Bags	SC-6, SC-8	
☐ Dewatering Filtration	NS-2	
☒ Storm Drain Inlet Protection	SC-10	
☐ Engineered Desilting Basin (sized for 10-year flow)	SC-2	
☒ **Preventing offsite tracking of sediment**		
☒ Stabilized Construction Entrance	TC-1	
☐ Construction Road Stabilization	TC-2	
☐ Entrance/Exit Tire Wash	TC-3	
☐ Entrance/Exit Inspection & Cleaning Facility	TC-1	
☐ Street Sweeping and Vacuuming	SC-7	
☒ **Materials Management**		
☒ Material Delivery & Storage	WM-1	
☒ Spill Prevention and Control	WM-4	
☒ **Waste Management[13]**		
☒ Waste Management Concrete Waste Management	WM-8	
☒ Solid Waste Management	WM-5	
☒ Sanitary Waste Management	WM-9	
☒ Hazardous Waste Management	WM-6	

[7] See Caltrans 2017 Construction Site Best Management Practices (BMP) Manual available at: https://dot.ca.gov/programs/construction/storm-water-and-water-pollution-control/manuals-and-handbooks
[8] Planting or Hydroseeding may be installed between May 1st and August 15th. Slope irrigation must be in place and operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. A contingency physical BMP must be implemented by August 15th if vegetation is not established by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.
[9] All slopes over three feet must have established vegetative cover prior to final permit approval.
[10] County PDS 659. Standard Lot Perimeter Protection Design System (Bldg. Division)
[11] County PDS 660. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Bldg. Division
[12] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater (also acceptable for velocity reduction)
[13] Applicants are responsible to apply appropriate BMPs for specific wastes (e.g., BMP WM-8 for concrete).

Table 7 – Explanations and Justifications for Construction Phase BMPs

☐ **Check here if no explanations or justifications for Table 6 BMPs are required.**		
Justifications for Table 6 Temporary Construction Phase BMPs • **Required Justifications**: Justify all construction activity types for which NO BMPs were selected. • **If Requested**: Justify why specific individual BMPs were not selected. • **Additional Explanation**: Describe any proposed features and/or BMPs not listed in Table 6.		
Activity Type / BMP		**Explanation**
Activity Type	Energy Dissipation	Energy dissipation is not applicable because none of the proposed storm drains discharge onto a pervious area.
BMP	All	
Activity Type		
BMP		
Activity Type		
BMP		
Activity Type		
BMP		
Activity Type		
BMP		
Activity Type		
BMP		
Activity Type		
BMP		

County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 1: Storm Water Intake Form for All Permit Applications

This form establishes Stormwater Quality Management Plan (SWQMP) requirements for Development Projects per Sections 67.809 and 67.811 of the County of San Diego Watershed Protection Ordinance (WPO).
See ***Storm Water Intake Form Instructions*** for additional guidance and explanation of terms.

Part 1. Project Information	
Project Name:	Passerelle Parcel 1
Record ID (Permit) No(s):	PDS2021-SPA-21-001
Assessor's Parcel No(s):	108-120-61 & 63
Street Address (or Intersection):	(Vacant) Horse Ranch Creek Road
City, State, Zip:	Fallbrook, CA 92028

Part 2. Applicant / Project Proponent Information	
Name:	Monty McCullough
Company:	Passerelle, LLC
Street Address:	10531 4S Commons Dr # 700
City, State, Zip:	San Diego, CA 92127
Phone Number	(858) 431-9622
Email:	monty@mddhomes.com

Part 3. Required Information for All Development Projects

Ⓐ	**1. Existing (pre-development) impervious surfaces (ft²)**	**2. Created or replaced impervious surfaces (ft²)**	**3. Total disturbed area (acres or ft²)**
	0	91,623	2.75 ac

Ⓑ		
	☒ Check here and provide a WDID# if this project is subject to the California Construction General Permit (Order No. 2009-0009-DWQ)[1]	**WDID # (if issued)**
		TBD during final engineering

For County Use Only	**Reviewed By:**	**Review Date:**
☐ Standard SWQMP	☐ PDP SWQMP	☐ Green Streets PDP Exemption SWQMP

[1] Available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html

Part 4. Priority Classification & SWQMP Form Selection

(A) *If your project is the following … (select one)*	(B) *You must complete …*
☐ **Standard Project** ☐ a. Project is East of the Pacific/Salton Sea Divide ☐ b. None of the PDP criteria below applies	➔ **Standard *SWQMP Form***
☒ **Priority Development Project (PDP)** ☐ 1. Project is part of an existing PDP**,** OR ☒ 2. Project does any of the following: ☒ a. Creates or replaces a total of 10,000 ft² or more of impervious surface ☒ b. Creates or replaces a combined total of 5,000 ft² or more of impervious surface within one or more of the following uses: (1) parking lots; (2) streets, roads, highways, freeways, and/or driveways; (3) restaurants; and (4) hillsides ☐ c. Creates or replaces a combined total of 5,000 ft² or more of impervious surface within one or more of the following uses: (1) automotive repair shops; and (2) retail gasoline outlets ☐ d. Discharges directly to an Environmentally Sensitive Area (ESA) AND creates or replaces 2,500 ft² or more of impervious surface ☒ e. Disturbs one or more acres of land (43,560 ft²) and is expected to generate pollutants post-construction ☐ f. Is a redevelopment project that creates or replaces 5,000 ft² or more of impervious surface on a site already having at least 10,000 ft² of impervious surface	➔ **PDP *SWQMP Form***
☐ **Green Streets PDP Exemption**[2]	➔ **Green *Streets PDP Exemption SWQMP Form***

Part 5. Applicant Signature

I have reviewed the information in this form, and it is true and correct to the best of my knowledge.

Applicant / Project Proponent Signature: William O'Gorman Date: 2/26/21

- ***Upon completion*** *submit this form to the County.*
- ***If requested****, attach supporting documentation to justify selections made or exemptions claimed.*
- ***If this is a PDP that is part of a larger existing PDP****, you will be required to attach a copy of the existing SWQMP to the newer SWQMP submittal.*

[2] ***Green Streets PDP Exemption Projects*** are those claiming exemption from PDP classification per WPO Section 67.811(b)(2) because they consist exclusively of *either* 1) development of new sidewalks, bike lanes, and/or trails; *or* 2) improvements to existing roads, sidewalks, bike lanes, and/or trails.

2.0 General Requirements

- Attachment 2 consolidates exhibits and plans required for the entire project.
- Complete the table below to indicate which sub-attachments are included with the submittal. Sub-attachments that are not applicable can be excluded from the submittal.
- Unless otherwise stated, features and BMPs identified and described in each corresponding Attachment (6 through 9) must be shown on applicable DMA Exhibits and construction plans submitted for the project.

Sub-attachments	Requirement
☒ **2.1: DMA Exhibits**	All PDPs
☒ **2.2: Individual Structural BMP DMA Mapbook**	PDPs with structural BMPs
☒ **2.3: Construction Plan Sets**	All projects

2.1 DMA Exhibits

- DMA Exhibits must show all DMAs on the project site. Exhibits must include all applicable features identified in applicable SWQMP attachments.
- Exhibits may be prepared individually for the BMPs associated with each applicable SWQMP Attachment (6, 7, 8, and/or 9) or combined into one or more consolidated exhibits.
- Use this checklist to ensure required information is included on each exhibit (copy as needed).

DMA Exhibit ID #:	
A. Features required for all exhibits	
1. Existing Site Features	
☒ Underlying hydrologic soil group (A, B, C, D)	☒ Topography and impervious areas
☒ Approximate depth to groundwater	☒ Existing drainage network, directions, and offsite connections
☐ Natural hydrologic features	
2. Drainage Management Area (DMA) Information	
☒ Proposed drainage network, directions, and offsite connections	☒ DMA boundaries, ID numbers, areas, and type (structural BMP, de minimis, etc.)
3. Proposed Site Changes, Features, and BMPs	
☒ Proposed demolition and grading	☐ Construction BMPs[2]
☒ Group 1, 2, and 3 Features[1]	☒ Baseline source control BMPs
☒ Group 4 Features	☒ Baseline source control BMPs
B. Proposed Features and BMPs Specific to Individual SWQMP Attachments[3]	
☐ Attachment 6	☐ SSD-BMP impervious dispersion areas ☐ SSD-BMP tree wells
☒ Attachment 7	☒ Structural pollutant control BMPs
☒ Attachment 8	☒ Structural hydromodification management BMPs ☒ Point(s) of Compliance (POC) for hydromodification management ☒ Proposed drainage boundary and drainage area to each POC
☒ Attachment 9	☐ Onsite CCSYAs ☐ Bypass of onsite CCSYAs ☐ Bypass of upstream offsite CCSYAs

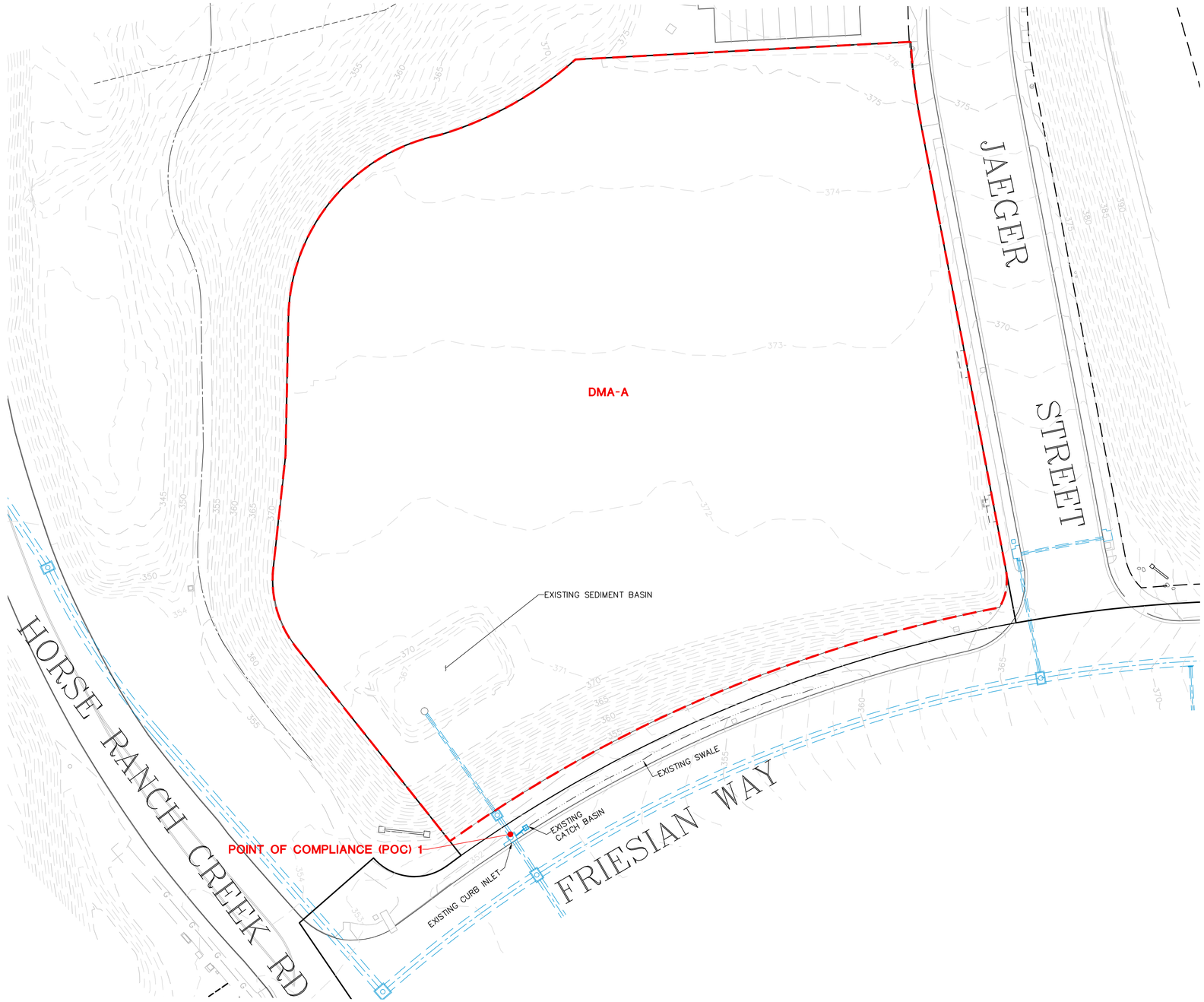
[1] Group 1-4 features and baseline BMPs from PDP SWQMP Tables 2 and 3.
[2] Minimum Construction Stormwater BMPs from PDP SWQMP Table 7.
[3] Identify the location, ID numbers, type, and size/detail of BMPs.

LEGEND

- EX. STORM DRAIN
- PROP. STORM DRAIN
- EX. INLET/CATCHBASIN/CLEANOUT
- DRAINAGE MANAGEMENT AREA BOUNDARY
- DRAINAGE DIRECTION

NOTES

1. CCSYA: NONE. SEE EXHIBIT IN ATTACHMENT 9
2. HYDROLOGIC SOIL GROUP: TYPE C PER COUNTY SOIL MAP
3. APPROXIMATE DEPTH TO GROUNDWATER: >10' (PREGRADED LOT)
4. EXISTING HYDRAULIC FEATURES: NONE



30 15 0 30 60 90

SCALE: 1" = 30'

PRE-DEVELOPED SUMMARY						
DMA	Total Area (sf)	Total Area (ac)	Impervious Area (sf)	Impervious Area (ac)	Pervious Area (sf)	Pervious Area (ac)
A	128,261	2.944	0	0.000	128,261	2.944

REVISIONS

NO.	DESCRIPTION	DATE	APP'D

Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

DATE: 2/11/21
SCALE: 1" = 30'
DRAWN: WOG
CHECKED: WOG

SHEET TITLE: PRE-DEVELOPED HMP EXHIBIT

PROJECT: CAMPUS PARK CONDOS
Horse Ranch Creek Rd
Fallbrook, CA 92028

SHEET 1 OF 1 SHEETS

SAVE DATE: 2/22/2021 ~ PLOT DATE: 2/22/2021 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Reports\SWQMP\Parcel 1\CAD\DMA MAP.dwg

LEGEND

- EX. STORM DRAIN
- PROP. STORM DRAIN
- EX. INLET/CATCHBASIN/CLEANOUT
- DRAINAGE MANAGEMENT AREA BOUNDARY
- DRAINAGE DIRECTION
- PROP. INLET/CATCHBASIN/CLEANOUT

SITE DESIGN BMPS

- SC-1 PREVENTION OF ILLICIT DISCHARGES INTO THE MS4
- SC-5 PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
- SC-6D1 NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- SC-6D2 LANDSCAPE/OUTDOOR PESTICIDE USE
- SC-6G REFUSE AREAS
- SC-6N FIRE SPRINKLER TEST WATER
- SC-6O MISCELLANEOUS DRAIN OR WASH WATER
- SC-6Q PLAZAS, SIDEWALKS, AND PARKING LOTS

SOURCE CONTROL BMPS

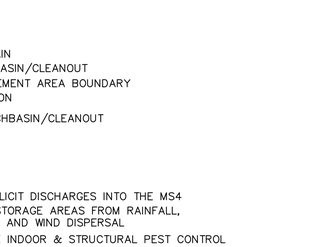
- SD-3 MINIMIZE IMPERVIOUS AREA
- SD-4 MINIMIZE SOIL COMPACTION
- SD-5 IMPERVIOUS AREA DISPERSION
- SD-6 RUNOFF COLLECTION
- SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

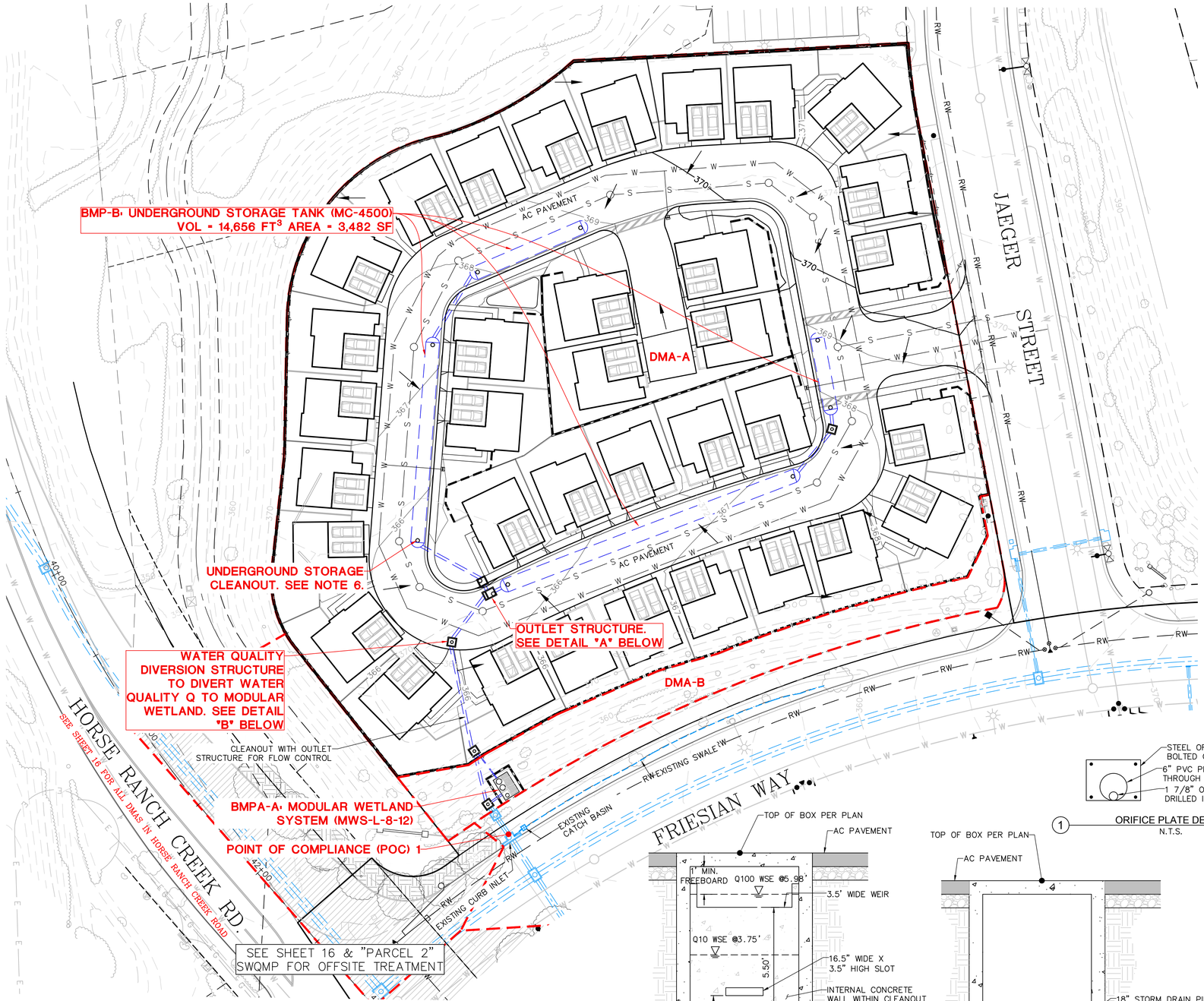
POST-CONSTRUCTION BMPS

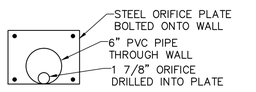
- MODULAR WETLAND SYSTEM (BF-3)
- UNDERGROUND STORAGE TANK

NOTES

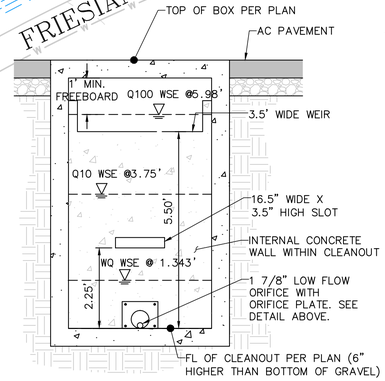
1. CCSYA: NONE. SEE EXHIBIT IN ATTACHMENT 9
2. HYDROLOGIC SOIL GROUP: TYPE C PER COUNTY SOIL MAP
3. APPROXIMATE DEPTH TO GROUNDWATER: >10' (PREGRADED LOT)
4. EXISTING HYDRAULIC FEATURES: NONE
5. EACH UNIT ASSUMED TO HAVE A 32'X10' MINIMUM IMPERVIOUS PATIO (NOT SHOWN)
6. UNDERGROUND STORAGE MAINTENANCE ACCESS VIA CLEANOUT.





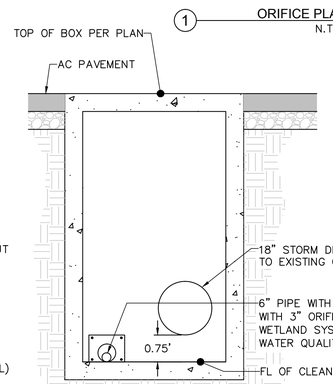


1 ORIFICE PLATE DETAIL
N.T.S.



NOTE: THE BOTTOM OF THE GRAVEL STORAGE LAYER FOR BMP-A IS 6" BELOW THE INVERT OF THE ORIFICE

A OUTLET STRUCTURE
SCALE: 1"=2'



B WQ DIVERSION STRUCTURE
SCALE: 1"=2'

DMA & BMP SUMMARY TABLE

DMA	DMA TYPE	BMP	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)
A	DRAINS TO BMP	BMP-A: MODULAR WETLAND SYSTEM (BF-2) & BMP-B: UNDERGROUND STORAGE TANK	119,764	2.749	91,623	2.103	28,141	0.646
B	SELF-MITIGATING	N/A	8,497	0.195	0	0.000	8,497	0.195
TOTAL			128,261	2.944	91,623	2.103	36,638	0.841

Civil Engineering • Environmental
2970 FIFTH AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

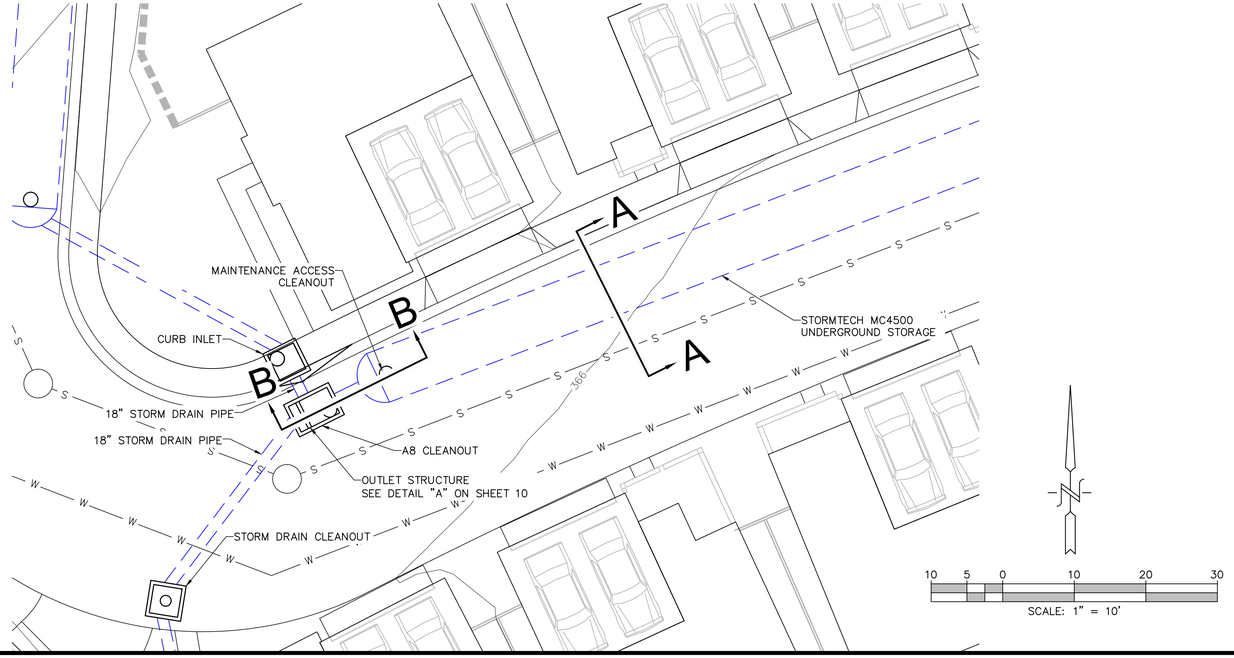
REVISIONS

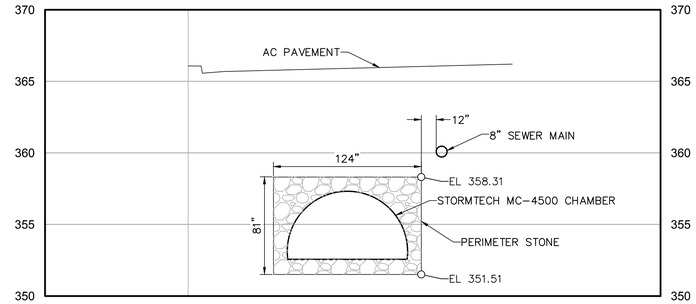
BY	DATE	DESCRIPTION

JOB NO. 1581

POST DEVELOPED DMA & HMP EXHIBIT
PASSERELLE (PARCEL 1)
COUNTY OF SAN DIEGO TRACT NO. _____
County of San Diego, California

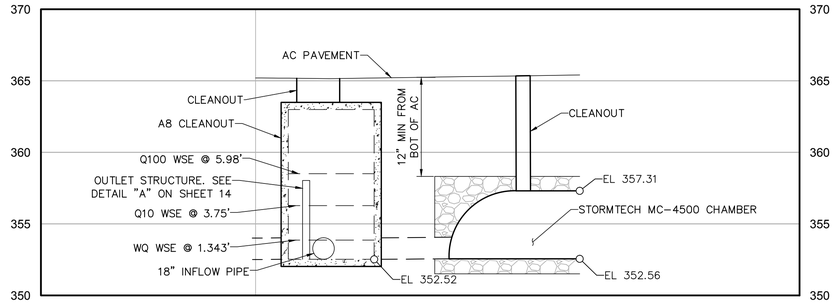
PARCEL 1 ~ BMP SECTIONS





SECTION ~ A-A

SCALE: HORZ: 1" = 5'
VERT: 1" = 5'



SECTION ~ B-B

SCALE: HORZ: 1" = 5'
VERT: 1" = 5'

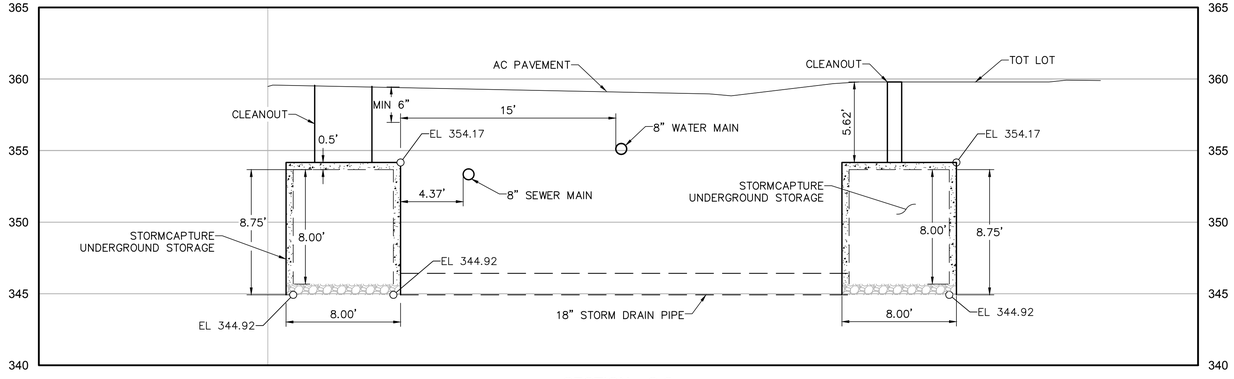
Civil Engineering • Environmental
2970 FIFTH AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

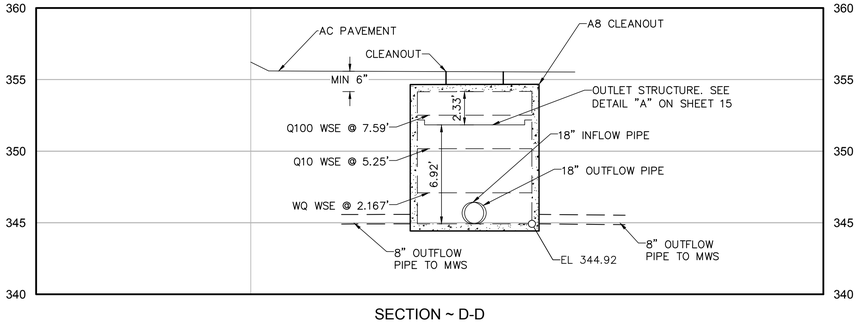
JOB NO. 1581

PARCEL 2 ~ BMP SECTIONS



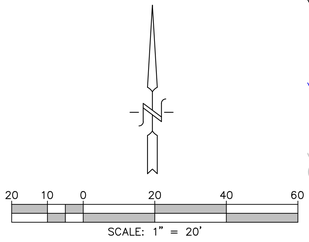
SECTION ~ C-C

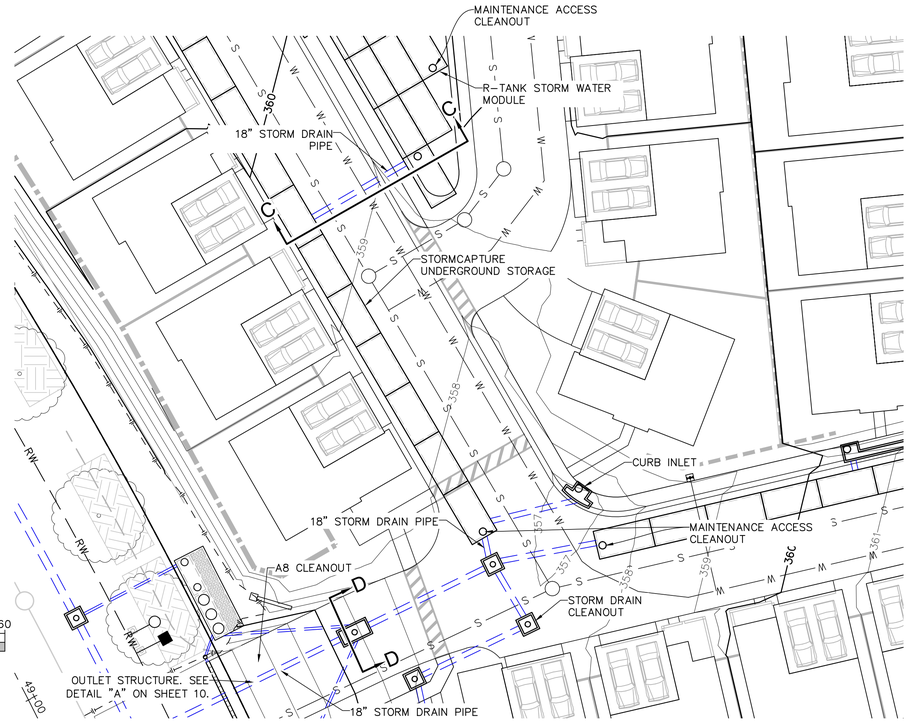
SCALE: HORZ: 1" = 5'
VERT: 1" = 5'



SECTION ~ D-D

SCALE: HORZ: 1" = 5'
VERT: 1" = 5'



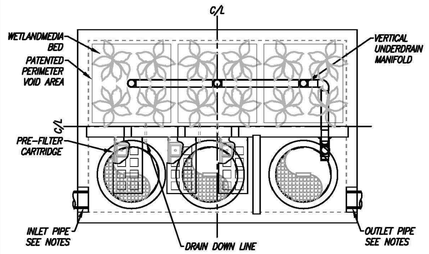


POST DEVELOPED CROSS SECTION DETAILS
PASSERELLE (PARCELS 1&2)
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

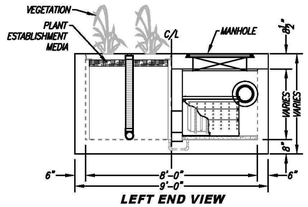
SHEET NO.
17 OF 18

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
FLOW BASED (CFS)			
0.346			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



PLAN VIEW



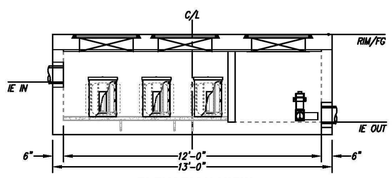
LEFT END VIEW

INSTALLATION NOTES

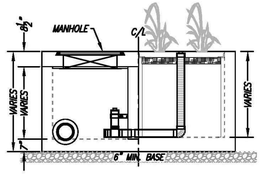
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER 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



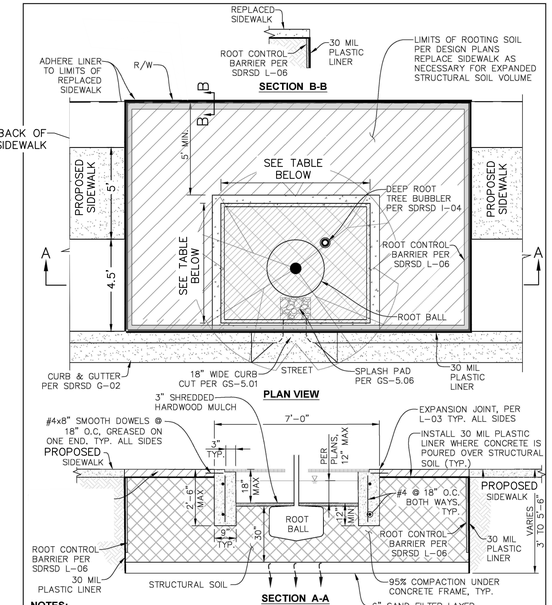
RIGHT END VIEW

TREATMENT FLOW (CFS)	0.346
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-8-12-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL



NOTES:
1. REFER TO GS-1.00 FOR ALL DETAILS NOT SHOWN HERE.
2. TREE SIZE & TYPE PER DESIGN PLANS.

DRAWING NOT TO SCALE

DRAWN BY: NJBE	CHECKED BY: KSK
RECOMMENDED BY: CHARLES MOHRLOCK, P.E.	
APPROVED BY COUNTY ENGINEER	
WILLIAM P. MORGAN, P.E. R.C.E. NO. 49452, EXP. 9/30/2022	DATE: 3/15/21

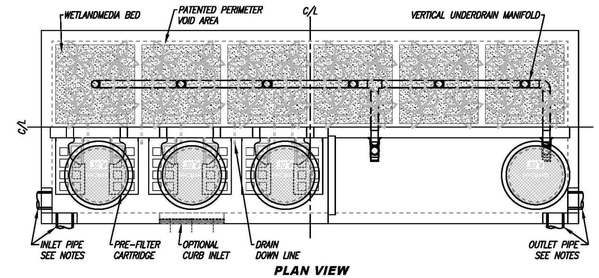
SAN DIEGO COUNTY DESIGN STANDARD

LARGE TREE WELL

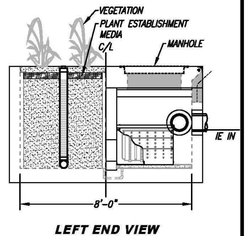
REVISIONS	APPROVED	DATE
ORIGINAL		10-01-2019
REVISED		03-08-2021

DRAWING NUMBER **GS-1.02**

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



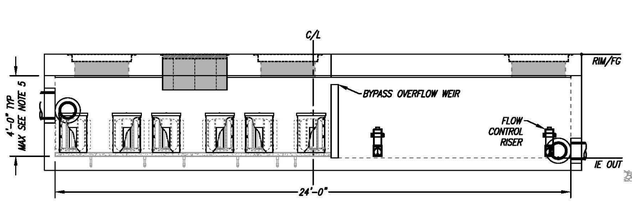
PLAN VIEW



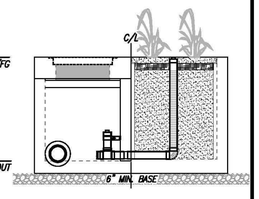
LEFT END VIEW

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 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.



ELEVATION VIEW



RIGHT END VIEW

TREE WELL DIMENSIONS					
DMA	HRCR-1	HRCR-2	HRCR-3	HRCR-4	HRCR-5
LENGTH (FT)	26.0	20.0	29.0	29.0	29.0
WIDTH (FT)	13.0	16.5	12.0	12.0	12.0
DEPTH (FT)	3.0	3.0	3.0	3.0	3.0

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

CONTECH® ENGINEERED SOLUTIONS LLC www.ContechES.com

MWS-L-8-24-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

Civil Engineering • Environmental
2970 FIFTH AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS | BY | DATE | DESCRIPTION

JOB NO. 1581

MODULAR WETLANDS STANDARD DETAILS
PASSERELLE (PARCELS 1&2)
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
18 OF 18

2.2 Individual Structural BMP DMA Mapbook

- Use this page as a cover sheet for the Structural DMA Mapbook.
- An individual Structural DMA Mapbook must be submitted for any project site with one or more structural BMPs. One Mapbook is required for each unique subsequent owner with responsibility for maintenance of a Structural BMP. Mapbook exhibits will be incorporated as exhibits in Stormwater Maintenance Agreements (SWMAs) and Maintenance Notifications (MNs). See Attachment 11 for additional information on maintenance agreements. If the Mapbook has been provided for each subsequent owner in Attachment 11, they are not required here.
- Place each map on 8.5"x11" paper.
- Show at a minimum the DMA, Structural BMP, Assessor's parcel boundaries with parcel numbers, and any existing hydrologic features within the DMA.

☐	All Mapbooks are attached
☒	All Mapbooks are in Attachment 11

2.3 Construction Plan Sets

- DMAs, features, and BMPs identified and described in this attachment must also be shown on all applicable construction and landscape plans.
- As applicable, plan sheets must identify:
    - All features and BMPs identified in Sub-attachment 2.1 (DMA Exhibits).
    - The additional information listed below.
- Use this checklist to ensure required information is included on each plan (copy as needed).

Plan Type	**Tentative Map**
Required Information[4]	
☒ Structural BMP(s) and Significant Site Design BMPs (if applicable) with ID numbers.	
☒ 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) and Significant Site Design BMPs (if applicable).	
☒ Signage indicating the location and boundary of structural BMP(s) as required by County staff.	
☒ 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).	
☒ 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 (if available) 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 manufacturer model number must be provided. Photocopies of general brochures are not acceptable.	
☐ Include all source control and site design measures described in the SWQMP.	
☐ Include all construction BMPs described in the SWQMP.	

[4] For Building Permit Applications, refer to Form PDS 272, https://www.sandiegocounty.gov/content/dam/sdc/pds/docs/pds272.pdf

PRELIMINARY GRADING PLAN
"PASSERELLE"
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

GENERAL NOTES:

1. COUNTY ASSESSORS PARCEL No. 108-120-61, 108-120-62
2. TAX RATE AREA: 75169 (APN 108-120-61)
   75035 (APN 108-120-62)
3. GROSS AREA = 29.00 ACRES, NET AREA = 20.34 ± ACRES
4. NUMBER OF LOTS IS 5 LOTS
   (2) SINGLE-FAMILY CONDOMINIUM LOTS (TOTAL NUMBER OF UNITS 138)
   (1) REMAINDER LOT
   (2) PUBLIC STREET LOTS
5. COMMUNITY PLAN: FALLBROOK
6. NO SPECIAL ASSESSMENT ACT PROCEEDINGS ARE PROPOSED
7. PARK FEES IN LIEU OF PARK LAND DEDICATION IS PROPOSED
8. STREET LIGHTS TO BE INSTALLED IN ACCORDANCE WITH COUNTY STANDARDS.
9. TOPOGRAPHY: AERIAL SURVEY PROVIDED BY RANCHO COASTAL ENGINEERING & SURVEYING ON DECEMBER 18, 2019.
10. SEWER SERVICE: RAINBOW MUNICIPAL WATER DISTRICT - CHAD WILLIAMS 760-728-1178
11. WATER SERVICE: RAINBOW MUNICIPAL WATER DISTRICT - CHAD WILLIAMS 760-728-1178
12. FIRE PROTECTION SERVICE: NORTH COUNTY FIRE DISTRICT
    DOMINIC FIERA FIRE MARSHALL 760 723 2040
13. SCHOOLS: FALLBROOK UNIFIED SCHOOL DISTRICT - CYNTHIA MARTIN 760-731-5445 & FALLBROOK UNIFIED SCHOOL DISTRICT & UNION HIGH SCHOOL DISTRICT - BRENDA MEFFORD 760-723-6332 x6195
14. ALL ONSITE STREETS WILL BE PRIVATE.
15. ALL CUT AND FILL SLOPES ARE 2:1 UNLESS OTHERWISE NOTED.
16 STORM DRAIN DETENTION FACILITIES SHALL BE PROVIDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE COUNTY OF SAN DIEGO, DEPARTMENT OF PUBLIC WORKS.

LEGAL DESCRIPTION

PARCEL 2 OF PARCEL MAP NO. 21006, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY ON SEPTEMBER 25, 2012 AS FILE NO. 2012-0581442, OFFICIAL RECORDS

TOPO SOURCE

TOPOGRAPHY SURVEY PROVIDED BY RANCHO COASTAL ENGINEERING & SURVEYING.
DATE OF SURVEY DECEMBER 2019

EASEMENTS NOTES

SEE SHEET 2 FOR EASEMENTS PER PRELIMINARY TITLE REPORT PREPARED BY CHICAGO TITLE INSURANCE COMPANY ~ ORDER No. 00110425-996-SDI-CF2

NOISE RESTRICTION EASEMENT:

A NOISE RESTRICTION EASEMENT SHALL BE PLACED ON THE ENTIRE AREA OF THE PROJECT SITE AND WILL BE GRANTED TO THE COUNTY OF SAN DIEGO ON THE FINAL MAP.

SOLAR ACCESS STATEMENT:

ALL UNITS WITHIN THIS SUBDIVISION HAVE A MINIMUM OF 100 SQ. FT. OF SOLAR ACCESS FOR EACH FUTURE DWELLING UNIT ALLOWED BY THIS SUBDIVISION.

STREET LIGHT STATEMENT:

1. THE SUBDIVIDER INTENDS TO COMPLY WITH THE STREET LIGHT REQUIREMENTS AS SPECIFIED IN THE COUNTY STANDARDS. THIS SUBDIVISION IS PROPOSING ONLY PRIVATE STREETS.
2. ALL OUTDOOR LIGHTING SHALL CONFORM TO THE COUNTY OF SAN DIEGO LIGHTING CODE AND LIGHTING REQUIREMENTS WITHIN THE PERFORMANCE STANDARDS OF THE ZONING ORDINANCE

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS CCS 83, ZONE 6, EPOCH 1991.35 GRID BEARING BETWEEN STATION "SDGPS 03" AND STATION "SDGPS 08" BOTH HAVING A CALIFORNIA COORDINATE VALUE OF FIRST ORDER ACCURACY, PER NATIONAL GEODETIC SURVEY DATA HTDP V2.4. SEE ROS 16810. I.E. NORTH 21°47'56" EAST. QUOTED BEARINGS FROM REFERENCE MAPS OR DEEDS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM. THE COMBINED GRID FACTOR AT STATION "SPGPS 03" IS 0.9999447. ELEVATION AT SAID STATION = 308.26 (NAVD 88) GRID DISTANCE = GROUND DISTANCE X COMBINED GRID FACTOR. ALL DISTANCES SHOWN ARE GROUND, UNLESS OTHERWISE NOTED.

CONDOMINIUM MAP STATEMENT:

THIS IS A MAP OF A CONDOMINIUM PROJECT AS DEFINED IN SECTION 1350 OF THE STATE OF CALIFORNIA CIVIL CODES

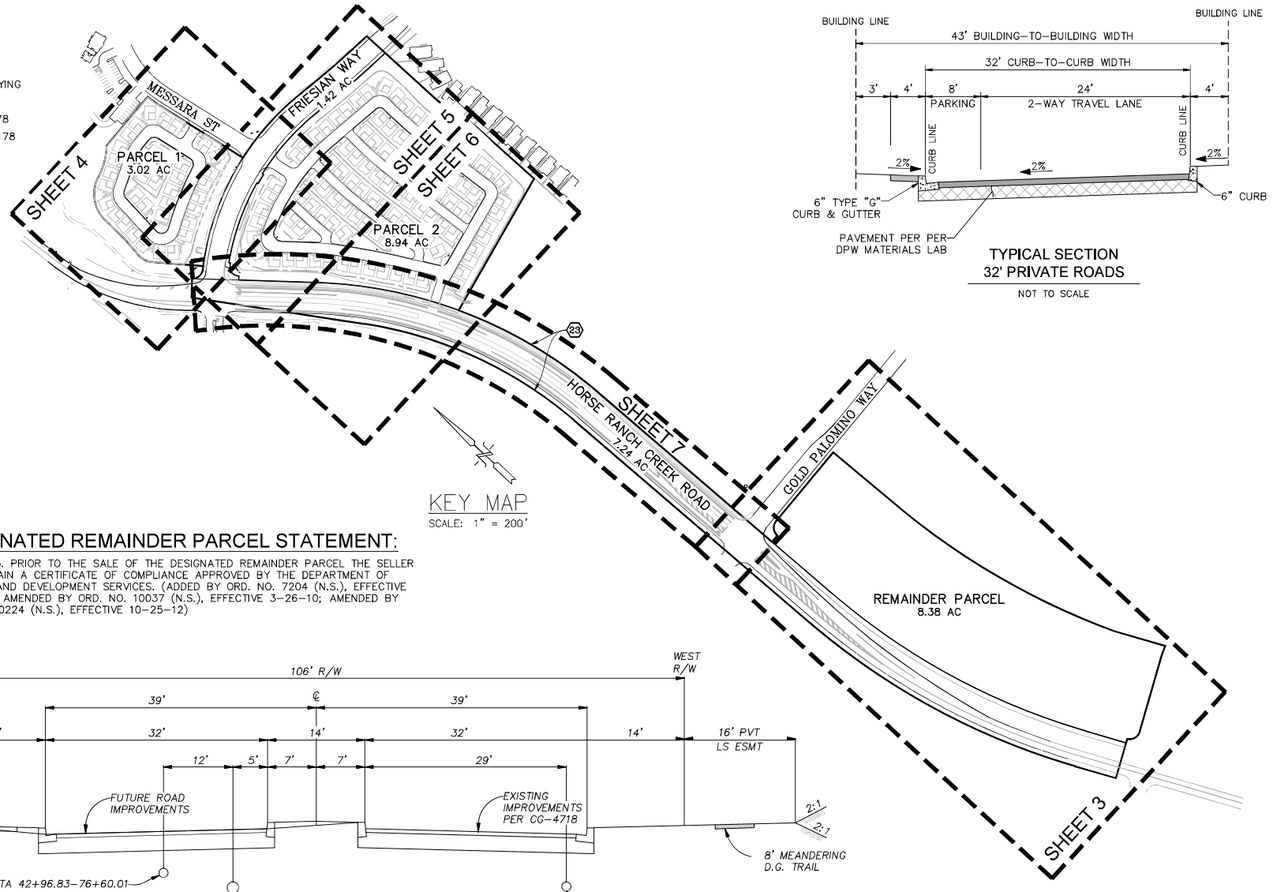
GRADING QUANTITIES

CUT	29,500
FILL	29,500
NET	BALANCE

MAX CUT = 18'
MAX FILL = 12'

PLAN NOTE:

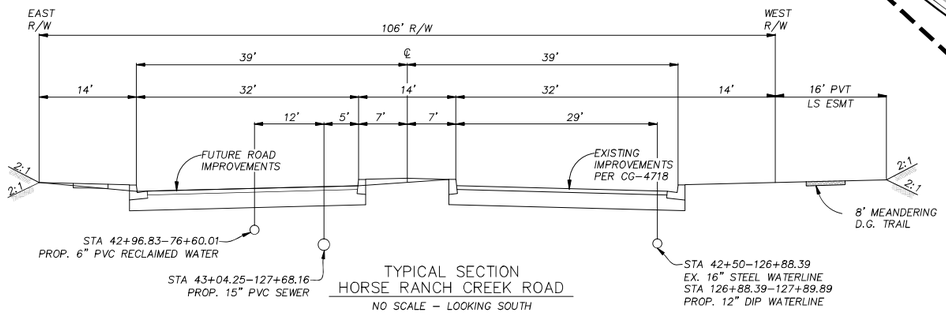
THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY



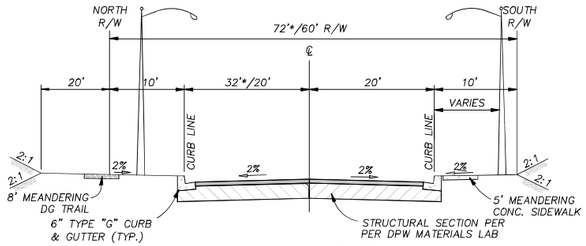
KEY MAP
SCALE: 1" = 200'

DESIGNATED REMAINDER PARCEL STATEMENT:

SEC. 81.515. PRIOR TO THE SALE OF THE DESIGNATED REMAINDER PARCEL THE SELLER SHALL OBTAIN A CERTIFICATE OF COMPLIANCE APPROVED BY THE DEPARTMENT OF PLANNING AND DEVELOPMENT SERVICES. (ADDED BY ORD. NO. 7204 (N.S.), EFFECTIVE 10-17-86; AMENDED BY ORD. NO. 10037 (N.S.), EFFECTIVE 3-26-10; AMENDED BY ORD. NO. 10224 (N.S.), EFFECTIVE 10-25-12)



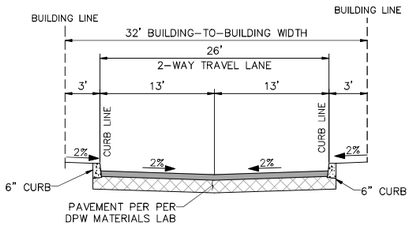
TYPICAL SECTION
HORSE RANCH CREEK ROAD
NO SCALE - LOOKING SOUTH



TYPICAL SECTION
FRIESIAN WAY (PUBLIC)
NO SCALE - LOOKING EAST

NOTE:
PRIVATE ROAD STRUCTURAL SECTION SHALL BE A MINIMUM OF TWO INCHES OF ASPHALT CONCRETE OVER FOUR INCHES OF APPROVED BASE. ADEQUACY OF THE STRUCTURAL SECTION AND SURFACE DRAINAGE SHALL BE INSPECTED AND CERTIFIED BY THE DIRECTOR OF PUBLIC WORKS.

TYPICAL SECTION
32' PRIVATE ROADS
NOT TO SCALE



TYPICAL SECTION
26' PRIVATE ROADS
NOT TO SCALE

LEGEND

PROPOSED:
- R/W — RIGHT-OF-WAY
- P/L — PROPERTY BOUNDARY
- CENTERLINE
- LOT LINE
- EASEMENTS
- BUILDING SETBACKS
- S — S — PROPOSED SEWER MAIN
- (S) — PROPOSED SEWER LATERAL
- PROPOSED SEWER MANHOLE

EXISTING:
- EX FH
- 420 — EX CONTOUR
- EX POWER POLE
- S — S — EX SEWER MAIN
- EX SEWER MANHOLE

APN'S:

108-120-61, 108-120-63

SITE ADDRESS

VACANT LAND HORSE RANCH CREEK ROAD
5378' NORTH OF SR 76

OWNER / DEVELOPER:

I CERTIFY UNDER PENALTY OF PERJURY THAT I MEET THE ELIGIBILITY REQUIREMENTS TO SUBDIVIDE THIS PARCEL BY THE MINOR SUBDIVISION PROCESS, IN ACCORDANCE WITH THE ELIGIBILITY REQUIREMENTS IN SECTION 81.602 OF THE COUNTY OF SAN DIEGO SUBDIVISION ORDINANCE.

NAME: MONTY MCCULLOUGH,
MCCULLOUGH DESIGN DEVELOPMENT
ADDRESS: 16773 CAMINITO DEL VIENTECITO,
SAN DIEGO, CA 92127
TELEPHONE: (858) 431-9622

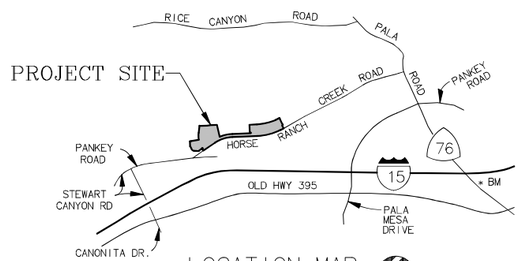
NAME DATE

ENGINEER OF WORK

REC CONSULTANTS, INC.
2442 SECOND AVENUE
SAN DIEGO, CA 92101
PH. (619) 232-9200

REGISTERED PROFESSIONAL ENGINEER
JONATHAN RAAB RYDEEN
RCE ~ 64811
EXP 6/30/21
CIVIL
STATE OF CALIFORNIA

JONATHAN RAAB RYDEEN R.C.E. 64811 DATE
EXPIRES ON 6/30/21



LOCATION MAP
NOT TO SCALE
FALLBROOK, THOMAS GUIDE
PG. 1028 H-4, 5, 6, & 7
PG. 1048 H-1 & 2

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
1 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

PRELIMINARY GRADING PLAN
"PASSERELLE"
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

EASEMENTS NOTES

EASEMENTS PER PRELIMINARY TITLE REPORT PREPARED BY:
CHICAGO TITLE INSURANCE COMPANY ~ ORDER No. 00110425-996-SDI-CF2

(1) AN EXISTING EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY
PURPOSE:. PUBLIC UTILITIES, INGRESS, EGRESS
RECORDED:. AUGUST 27, 1926 IN BOOK 1248, PAGE 267 OF DEEDS (TO BE QUITCLAIMED)

2 AN EXISTING EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY
PURPOSE:. PUBLIC UTILITIES, INGRESS, EGRESS
RECORDED:. OCTOBER 21, 1937 AS INSTRUMENT NO.64819 IN BOOK 694, PAGE 462, OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

3 AN EXISTING EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY
PURPOSE: PUBLIC UTILITIES, INGRESS, EGRESS
RECORDED: OCTOBER 22, 1937 IN BOOK 714, PAGE 60 OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

(4) AN EXISTING EASEMENT TO HENRY R. DEAN, ET AL
PURPOSE:. ROAD PURPOSES
RECORDED:. FEBRUARY 13, 1948 AS INSTRUMENT NO. 14948 IN BOOK 2269, PAGE 339, OF OFFICIAL RECORDS (TO BE QUITCLAIMED)

(5) AN EXISTING EASEMENT TO THE COUNTY OF SAN DIEGO
PURPOSE:. PUBLIC ROAD PURPOSES
RECORDED:. AUGUST 10, 1948 AS INSTRUMENT NO. 78889 IN BOOK 2905, PAGE 434, OF OFFICIAL RECORDS (TO BE QUITCLAIMED)

(6) AN EXISTING EASEMENT TO THE COUNTY OF SAN DIEGO
PURPOSE:. PUBLIC ROAD PURPOSES
RECORDED:. AUGUST 10, 1948 IN BOOK 2905, PAGE 435, OF OFFICIAL RECORDS (TO BE QUITCLAIMED)

(7) AN EXISTING EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY
PURPOSE:. PUBLIC UTILITIES, INGRESS, EGRESS
RECORDED:. JUNE 20, 1951 IN BOOK 4151, PAGE 492, OF OFFICIAL RECORDS (TO BE QUITCLAIMED)

8 AN EXISTING EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY
PURPOSE:. PUBLIC UTILITIES, INGRESS, EGRESS
RECORDED:. DECEMBER 14, 1951 IN BOOK 4320, PAGE 280, OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

9 AN EXISTING EASEMENT TO THE SAN DIEGO GAS AND ELECTRIC COMPANY
PURPOSE:. PUBLIC UTILITIES, INGRESS, EGRESS
RECORDED:. JULY 2, 1974 AS INSTRUMENT NO. 74-177833, OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

10 AN EXISTING EASEMENT TO RAINBOW MUNICIPAL WATER DISTRICT, A MUNICIPAL CORPORATION
PURPOSE:. PIPELINE OR PIPELINES
RECORDED:. JUNE 13, 1978 AS INSTRUMENT NO. 78-244432, OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

11 AN EXISTING EASEMENT FOR TO RAINBOW MUNICIPAL WATER DISTRICT, A MUNICIPAL CORPORATION
PURPOSE:. A PIPELINE OR PIPELINES
RECORDED:. OCTOBER 6, 1978 AS INSTRUMENT NO. 78-0425959, OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

(12) AN EXISTING EASEMENT TO WILLIAM B. BUCK, ET AL
PURPOSE:. ROAD AND UTILITY PURPOSES
RECORDED:. OCTOBER 31, 1978 AS INSTRUMENT NO. 78-471499, OF OFFICIAL RECORDS
QUITCLAIM DEED RECORDED JANUARY 9, 1981 AS FILE NO. 81-006489, WILLIAM B. BUCK ET AL, QUITCLAIM OF INTEREST OF THE HEREIN ABOVE DESCRIBED EASEMENT.

(13) AN EXISTING EASEMENT TO PAKEY RANCH
PURPOSE:. ROAD AND PUBLIC UTILITY
RECORDED:. DECEMBER 4, 1979 AS INSTRUMENT NO. 79-508977, OF OFFICIAL RECORDS (TO BE QUITCLAIMED)

(14) AN EXISTING EASEMENT TO ROBERT H. PANKEY AND ROSEMARY R. PANKEY, HUSBAND AND WIFE AS COMMUNITY PROPERTY, ET AL
PURPOSE:. ROAD AND UTILITY PURPOSES
RECORDED:. JANUARY 8, 1981 AS INSTRUMENT NO. 81-006490, OF OFFICIAL RECORDS (TO BE QUITCLAIMED)
AND RE-RECORDED JUNE 10, 1981 AS INSTRUMENT NO. 81-181138, OF OFFICIAL RECORDS. (TO BE QUITCLAIMED)

(15) AN EXISTING EASEMENT FOR ROAD AND UTILITIES
RECORDED:. MARCH 27, 1981 AS INSTRUMENT NO. 81-092782 (TO BE QUITCLAIMED)

16 AN EXISTING EASEMENT TO THE SAN LUIS REY MUNICIPAL WATER DISTRICT
PURPOSE:. ACCESS AND DEVELOPMENT OF WATERS, WELLSITES, AND WATER WORKS
RECORDED:. JULY 26, 1984 AS INSTRUMENT NO. 84-284008, OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

19 EXISTING EASEMENTS FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SHOWN OR AS OFFERED FOR DEDICATION ON THE RECORDED PARCEL MAP 13703. (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

21 A DOCUMENT ENTITLED 'AGREEMENT FOR GRANT OF EASEMENTS', DATED, JUNE 15, 2007, EXECUTED BY PASSERELLE, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY AND PALOMAR COMMUNITY COLLEGE DISTRICT, SUBJECT TO ALL THE TERMS, PROVISIONS AND CONDITIONS THEREIN CONTAINED, RECORDED JUNE 14, 2007 AS INSTRUMENT NO. 2007-0403365, OF OFFICIAL RECORDS. A DOCUMENT ENTITLED 'AGREEMENT FOR GRANT OF EASEMENTS', DATED, JUNE 15, 2007, EXECUTED BY PASSERELLE, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY AND PALOMAR COMMUNITY COLLEGE DISTRICT, SUBJECT TO ALL THE TERMS, PROVISIONS AND CONDITIONS THEREIN CONTAINED, RECORDED JUNE 14, 2007 AS INSTRUMENT NO. 2007-0403364, OF OFFICIAL RECORDS. (EASEMENT IS NOT PLOTABLE)

22 AN EXISTING EASEMENT TO SAN DIEGO GAS & ELECTRIC COMPANY, A CORPORATION
PURPOSE:. UTILITIES, INGRESS & EGRESS
RECORDED:. JANUARY 7, 2011, AS INSTRUMENT NO. 2011-0013745 OF OFFICIAL RECORDS (EASEMENT NOT LOCATED ON SUBJECT PROPERTY)

(23) AN EXISTING EASEMENT TO THE COUNTY OF SAN DIEGO
PURPOSE:. PUBLIC HIGHWAY
RECORDED:. JANUARY 10, 2011, AS INSTRUMENT NO. 2011-0017036 OF OFFICIAL RECORDS

(30) AN EXISTING EASEMENT TO THE COUNTY OF SAN DIEGO, A POLITICAL SUBDIVISION OF THE STATE OF CALIFORNIA
PURPOSE: COUNTY HIGHWAY
RECORDING DATE: DECEMBER 05, 2013
RECORDING NO: 2013-0706899 OF OFFICIAL RECORDS

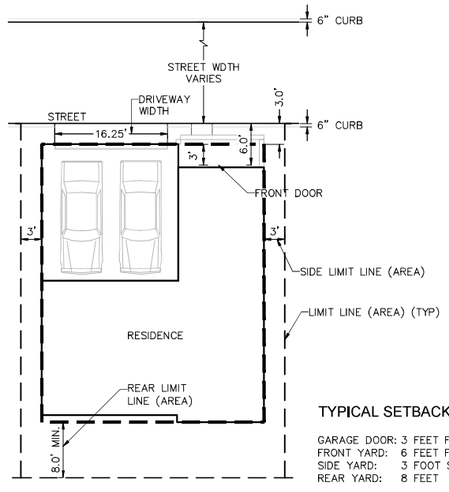
(33) AN EXISTING EASEMENT TO RAINBOW MUNICIPAL WATER DISTRICT, A MUNICIPAL WATER DISTRICT
PURPOSE: PUBLIC UTILITIES, INGRESS, EGRESS
RECORDING DATE: MARCH 26, 2014
RECORDING NO: 2014-0117990 OF OFFICIAL RECORDS

(34) EXISTING EASEMENTS CONTAINED IN THAT CERTAIN DOCUMENT
ENTITLED: EASEMENT AGREEMENT
RECORDING DATE: MAY 26, 2015
RECORDING NO: 2015-0265828 OF OFFICIAL RECORDS

35 AN EXISTING EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY, A CORPORATION
PURPOSE: PUBLIC UTILITIES, INGRESS, EGRESS
RECORDING DATE: MARCH 18, 2016
RECORDING NO: 2016-0120629 OF OFFICIAL RECORDS
(EASEMENT IS NOT PLOTABLE)

(36) EXISTING MATTERS CONTAINED IN THAT CERTAIN DOCUMENT
ENTITLED: TEMPORARY FUEL MANAGEMENT EASEMENT AGREEMENT
RECORDING DATE: MARCH 22, 2016
RECORDING NO: 2016-0126290 OF OFFICIAL RECORDS

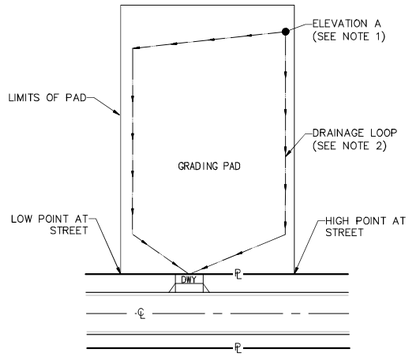
(37) EXISTING MATTERS CONTAINED IN THAT CERTAIN DOCUMENT
ENTITLED: WALLS AND FENCES EASEMENT AND COST-SHARING AGREEMENT
RECORDING DATE: DECEMBER 07, 2016
RECORDING NO: 2016-0671680 OF OFFICIAL RECORDS



TYPICAL SETBACKS:

GARAGE DOOR: 3 FEET FROM STREET
FRONT YARD: 6 FEET FROM LIMIT LINE
SIDE YARD: 3 FOOT SIDE YARD LIMIT
REAR YARD: 8 FEET

2 TYP. MIN. RESIDENTIAL LOT CONFIGURATION
NOT TO SCALE



NOTES:
1. ELEVATION "A" IS LOCATED AT THE MOST REMOTE CORNER OF THE PAD FROM THE DRIVEWAY.
2. MINIMUM 1% SWALE TO STREET OR OTHER DISCHARGE POINT.
3. ALL SLOPE SURFACES SHALL BE PROTECTED BY APPROVED EROSION CONTROL MATERIAL.
4. ALL PADS TO BE BERMED TO PREVENT RUN-OFF TO ADJACENT PADS.

3 TYPICAL RESIDENTIAL PAD DRAINAGE
NOT TO SCALE

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R.E.C Consultants, Inc.

REVISIONS	BY	DATE	DESCRIPTION

JOB NO. 1581

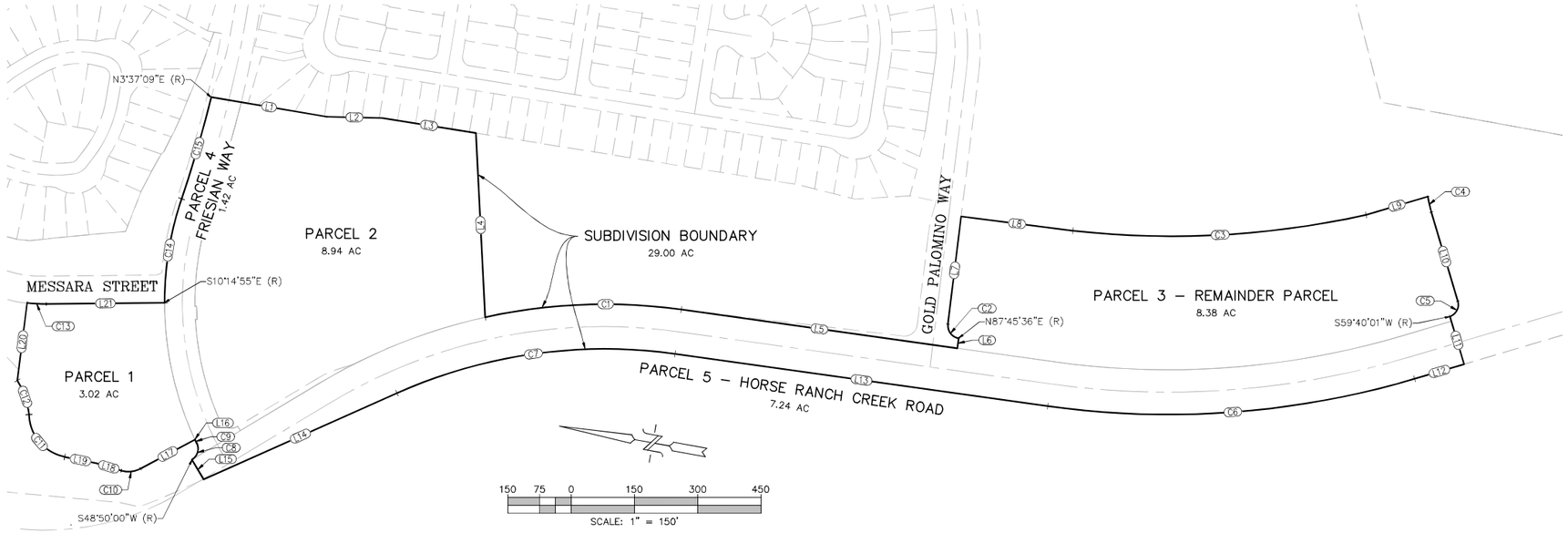
PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

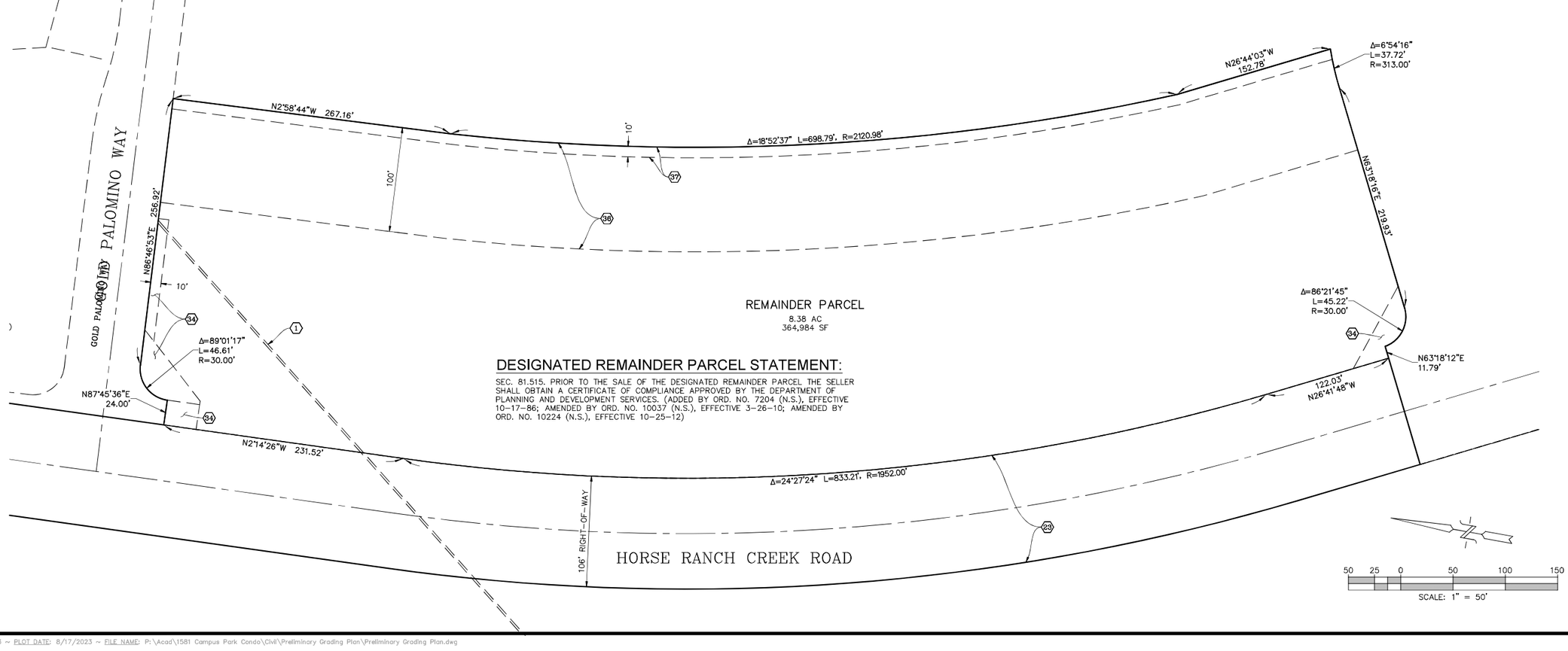
SHEET NO.
2 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

DATA TABLE			
#	BEARING/DELTA	RADIUS	LENGTH
C1	Δ = 20°24'20"	1313.00'	467.62'
C2	Δ = 89°01'17"	30.00'	46.61'
C3	Δ = 18°52'37"	2120.98'	698.79'
C4	Δ = 6°54'16"	313.00'	37.72'
C5	Δ = 86°21'45"	30.00'	45.22'
C6	Δ = 24°27'24"	2058.00'	878.46'
C7	Δ = 32°00'00"	1207.00'	674.12'
C8	Δ = 84°50'41"	30.00'	44.42'
C9	Δ = 0°44'03"	767.00'	9.83'
C10	Δ = 44°39'42"	60.00'	46.77'
C11	Δ = 77°32'54"	104.66'	141.65'
C12	Δ = 24°47'25"	199.02'	86.11'
C13	Δ = 7°21'11"	355.00'	45.56'
C14	Δ = 18°44'01"	767.00'	250.78'
C15	Δ = 4°51'57"	2958.00'	251.21'
L1	N 00°33'32" W		277.64'
L2	N 08°59'44" W		131.04'
L3	N 01°05'43" W		225.35'
L4	N 76°53'58" E		437.11'
L5	N 02°14'26" W		660.87'

DATA TABLE			
#	BEARING/DELTA	RADIUS	LENGTH
L6	N 87°45'36" E		24.00'
L7	N 86°46'53" E		256.92'
L8	N 02°58'44" W		267.16'
L9	N 26°44'03" W		152.78'
L10	N 63°18'16" E		219.93'
L11	N 63°18'12" E		117.79'
L12	N 26°41'48" W		122.03'
L13	N 02°14'24" W		892.40'
L14	N 34°14'24" W		502.01'
L15	N 48°50'34" E		54.30'
L16	N 54°45'17" E		0.26'
L17	N 38°25'37" W		146.38'
L18	N 06°14'05" E		62.22'
L19	N 01°11'58" E		76.23'
L20	N 86°59'34" E		185.12'
L21	N 10°47'30" W		280.22'





DESIGNATED REMAINDER PARCEL STATEMENT:

SEC. 81.515. PRIOR TO THE SALE OF THE DESIGNATED REMAINDER PARCEL THE SELLER SHALL OBTAIN A CERTIFICATE OF COMPLIANCE APPROVED BY THE DEPARTMENT OF PLANNING AND DEVELOPMENT SERVICES. (ADDED BY ORD. NO. 7204 (N.S.), EFFECTIVE 10-17-86; AMENDED BY ORD. NO. 10037 (N.S.), EFFECTIVE 3-26-10; AMENDED BY ORD. NO. 10224 (N.S.), EFFECTIVE 10-25-12)

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

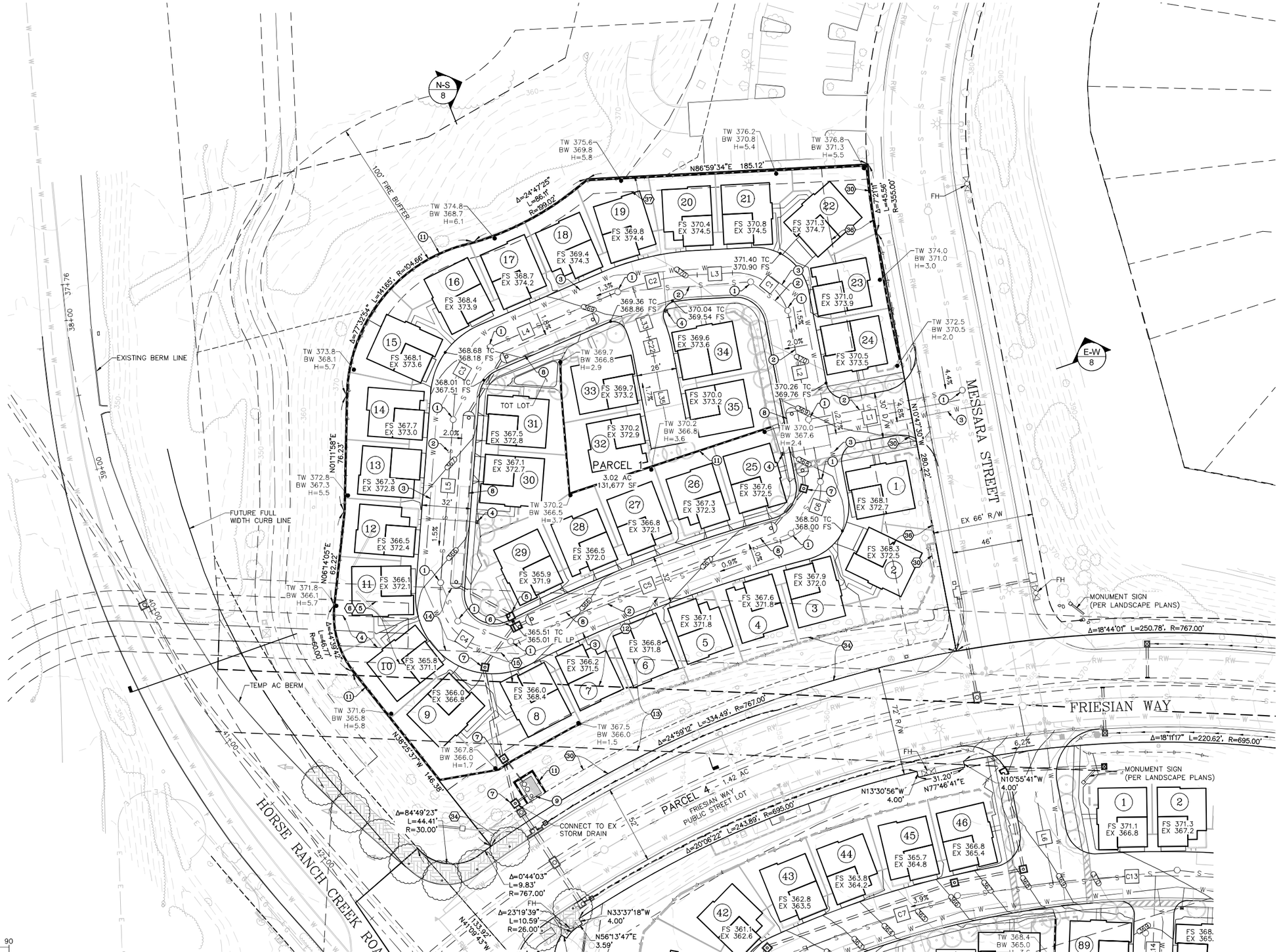
SHEET NO.
3 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

PRIVATE ROAD CENTERLINE			
#	BEARING/DELTA	RADIUS	LENGTH
C1	Δ = 82°12'56"	36.00'	51.66'
C2	Δ = 20°20'40"	166.00'	58.94'
C3	Δ = 62°17'18"	36.00'	39.14'
C4	Δ = 121°15'00"	36.00'	76.18'
C5	Δ = 11°29'20"	920.05'	184.49'
C6	Δ = 85°23'25"	36.00'	53.65'
C22	Δ = 7°11'32"	103.00'	12.93'
L1	S 79°12'30" W		100.03'
L2	N 10°47'30" W		107.85'
L3	S 86°59'34" W		23.25'
L4	S 66°38'54" W		87.77'
L5	S 04°21'35" W		128.88'
L33	S 17°59'03" E		34.76'
L35	S 10°47'30" E		56.16'

LEGEND

1. PROPOSED SEWER MAIN HOLE
2. PROPOSED SEWER MAIN
3. PROPOSED WATER MAIN
4. PROPOSED FIRE HYDRANT
5. PROPOSED CURB INLET
6. PROPOSED DIVERSION CHAMBER (SEE SHEET ___ FOR DETAILS)
7. PROPOSED STORM DRAIN CLEANOUT
8. PROPOSED UNDERGROUND STORAGE TANK (SEE SHEET ___ FOR DETAILS)
9. PROPOSED MODULAR WETLAND STRUCTURE (SEE SHEET ___ FOR DETAILS)
11. PROPOSED RETAINING WALL



Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS		
BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
4 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

PRIVATE ROAD CENTERLINE			
#	BEARING/DELTA	RADIUS	LENGTH
C7	Δ = 15°52'38"	606.00'	167.93'
C8	Δ = 108°21'01"	38.00'	71.86'
C9	Δ = 8°14'56"	616.00'	88.69'
C10	Δ = 2°55'06"	1216.00'	61.94'
C11	Δ = 7°31'15"	919.61'	120.71'
C12	Δ = 85°20'43"	31.00'	46.18'
C13	Δ = 13°32'33"	606.00'	143.24'
C14	Δ = 2°55'55"	1416.53'	72.48'
C15	Δ = 58°00'57"	28.00'	28.35'
C16	Δ = 7°31'15"	1184.00'	155.41'
L6	S 10°47'30" E		117.95'

PRIVATE ROAD CENTERLINE			
#	BEARING/DELTA	RADIUS	LENGTH
L7	N 41°09'35" W		87.32'
L8	N 32°54'39" W		91.04'
L9	S 05°33'55" E		228.71'
L10	S 01°57'20" W		17.87'
L11	S 83°23'23" E		160.92'
L12	N 00°08'23" E		42.57'
L13	N 55°29'31" E		23.50'
L14	N 01°57'20" E		63.25'
L15	N 05°33'55" W		175.76'
L16	S 01°57'20" W		57.50'

LEGEND

1. PROPOSED SEWER MAIN HOLE
2. PROPOSED SEWER MAIN
3. PROPOSED WATER MAIN
4. PROPOSED FIRE HYDRANT
5. PROPOSED CURB INLET
6. PROPOSED DIVERSION CHAMBER (SEE SHEET __ FOR DETAILS)
7. PROPOSED STORM DRAIN CLEANOUT
8. PROPOSED UNDERGROUND STORAGE TANK (SEE SHEET ____ FOR DETAILS)
9. PROPOSED MODULAR WETLAND STRUCTURE (SEE SHEET ____ FOR DETAILS)
10. PROPOSED STORM DRAIN INLET
11. PROPOSED RETAINING WALL

SCALE: 1" = 30'

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
5 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

LEGEND

1. PROPOSED SEWER MAIN HOLE
2. PROPOSED SEWER MAIN
3. PROPOSED WATER MAIN
4. PROPOSED FIRE HYDRANT
5. PROPOSED CURB INLET
6. PROPOSED DIVERSION CHAMBER (SEE SHEET __ FOR DETAILS)
7. PROPOSED STORM DRAIN CLEANOUT
8. PROPOSED UNDERGROUND STORAGE TANK (SEE SHEET ____ FOR DETAILS)
9. PROPOSED MODULAR WETLAND STRUCTURE (SEE SHEET ____ FOR DETAILS)
10. PROPOSED STORM DRAIN INLET
11. PROPOSED RETAINING WALL

PRIVATE ROAD CENTERLINE			
#	BEARING/DELTA	RADIUS	LENGTH
C9	Δ = 8°14'56"	616.00'	88.69'
C10	Δ = 2°55'06"	1216.00'	61.94'
C11	Δ = 7°31'15"	919.61'	120.71'
C14	Δ = 2°55'55"	1416.53'	72.48'
C15	Δ = 58°00'57"	28.00'	28.35'
C16	Δ = 7°31'15"	1184.00'	155.41'
C17	Δ = 7°31'15"	1055.33'	138.52'
C18	Δ = 73°06'29"	36.00'	45.94'
C19	Δ = 82°27'53"	31.00'	44.62'
C20	Δ = 65°34'22"	23.00'	26.32'
C21	Δ = 12°41'00"	164.00'	36.30'
L7	N 41°09'35" W		87.32'

PRIVATE ROAD CENTERLINE			
#	BEARING/DELTA	RADIUS	LENGTH
L8	N 32°54'39" W		91.04'
L9	S 05°33'55" E		228.71'
L13	N 55°29'31" E		23.50'
L15	N 05°33'55" W		175.76'
L17	S 05°33'55" E		273.83'
L18	N 29°59'33" W		129.80'
L19	S 76°53'58" W		216.15'
L20	N 60°00'27" E		29.83'
L21	N 76°53'58" E		54.33'
L22	N 64°12'58" E		82.33'

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

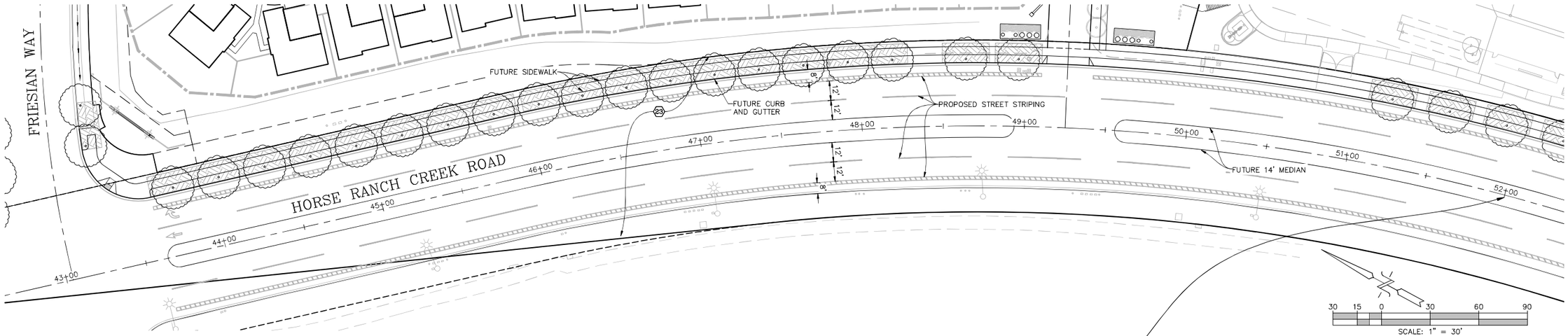
REVISIONS		
BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
6 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg



DRAFT CONDITION FOR PUBLIC IMPROVEMENTS BASED ON ORIGINAL TENTATIVE MAP DESIGN.

PRIOR TO THE APPROVAL OF THE FINAL MAP, IMPROVE OR AGREE TO IMPROVE AND PROVIDE SECURITY FOR ON- AND OFF-SITE HORSE RANCH CREEK ROAD FROM AN ACCEPTABLE INTERSECTION WITH GOLD PALOMINO WAY NORTHERLY TO FRIESIAN WAY AS FOLLOWS:

1) THE ROAD SHALL BE IMPROVED TO THE FOLLOWING STANDARD: PUBLIC BOULEVARD ROAD WITH RAISED MEDIAN STANDARDS TO A GRADED WIDTH OF ONE HUNDRED SIX FEET (106') WITH SEVENTY-EIGHT FEET (78') OF ASPHALT CONCRETE PAVEMENT OVER APPROVED BASE WITH PORTLAND CEMENT CONCRETE CURB, GUTTER AND SIDEWALK WITH FACE OF CURB AT THIRTY-NINE FEET (39') FROM CENTERLINE.

2) CONSTRUCT A FOURTEEN FOOT (14') WIDE RAISED MEDIAN WITH CONCRETE CURBS WITH FACE OF MEDIAN CURB AT SEVEN FEET (7') FROM CENTERLINE, INCLUDING TRANSITION NORTHERLY TO EXISTING PANKEY ROAD IMPROVEMENTS. 9HORSE CREEK RANCH RD. BECOMES PANKEY RD AFTER FRIESIAN WAY.

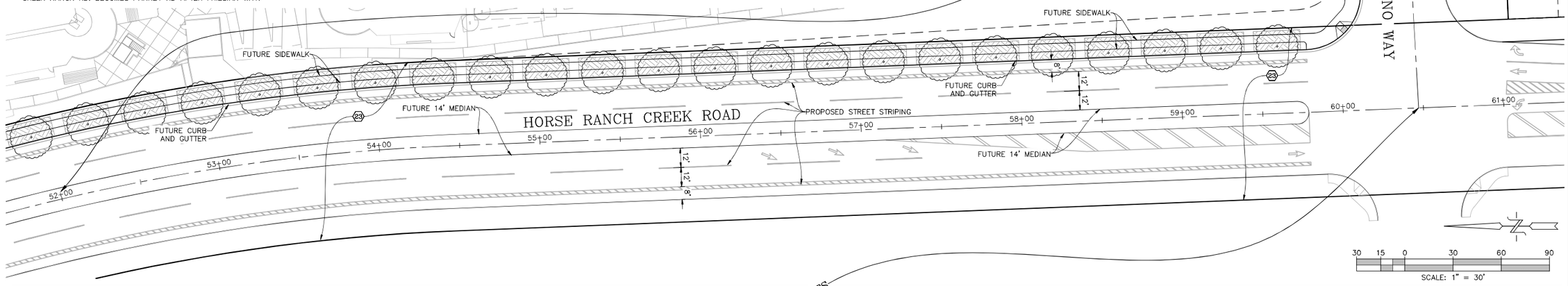
3) PROVIDE ADDITIONAL GRADING AND PAVING AS REQUIRED TO PROVIDE ADDITIONAL LEFT- AND RIGHT TURN LANES, AND PATHWAYS OR TRAILS ALONG THE IMPROVEMENTS AS NECESSARY.

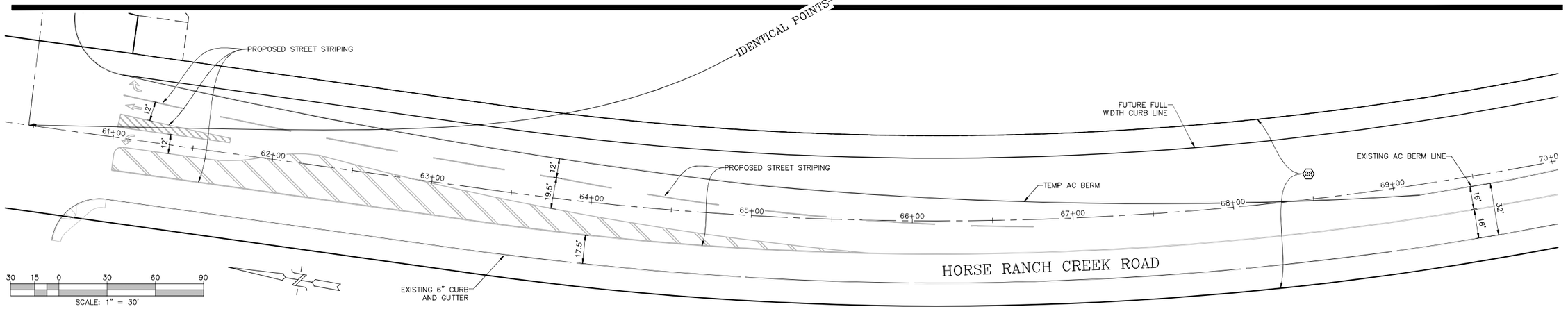
4) PROVIDE TRAFFIC SIGNALS WHEN TRAFFIC WARRANTS ARE MET AND PROVIDE TRANSITIONS ON- AND OFF-SITE.

5) SHOW THE PROPOSED ACCESS LOCATIONS FOR PALOMAR COLLEGE NORTH EDUCATION CENTER (WHICH HAS A CERTIFIED EIR) AND PROVIDE INTERSECTIONAL SEPARATIONS AND OPERATIONS WITH THE VTM 5338 RPL7 (AND VTM 5354RPL4) ACCESSES ACCORDING TO THE PUBLIC ROAD STANDARDS.

6) PROVIDE TRANSITIONS TO EXISTING PANKEY ROAD TO THE NORTH.

ALL OF THE ABOVE SHALL BE TO THE SATISFACTION OF CALTRANS AND THE DIRECTOR OF PUBLIC WORKS.





Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R.E.C
Consultants, Inc.

REVISIONS

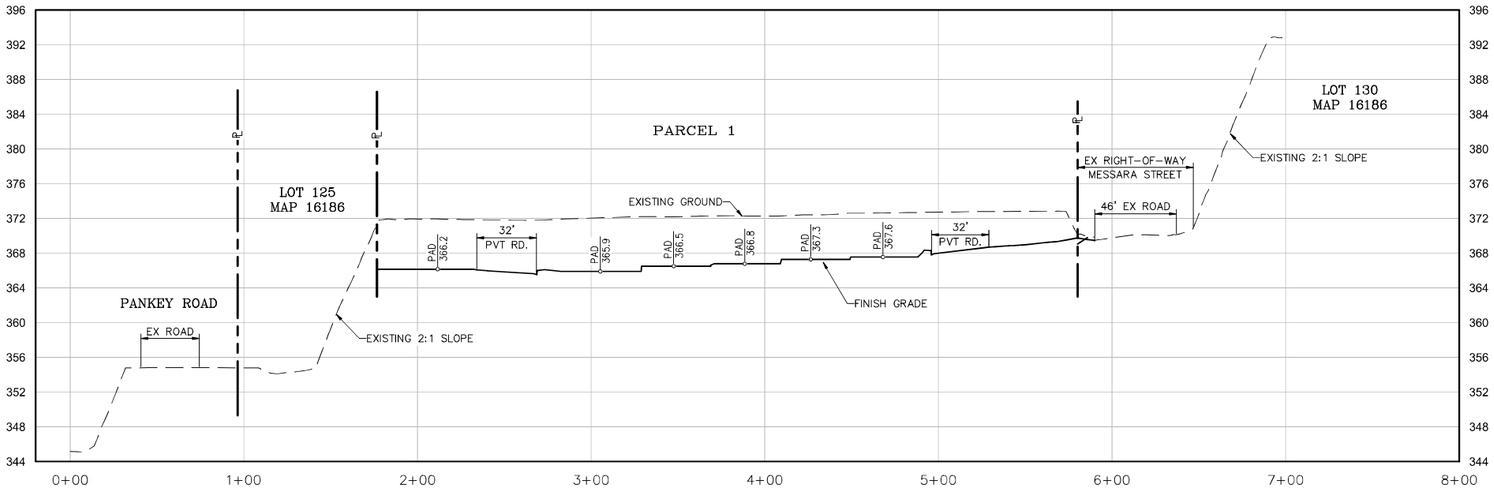
BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

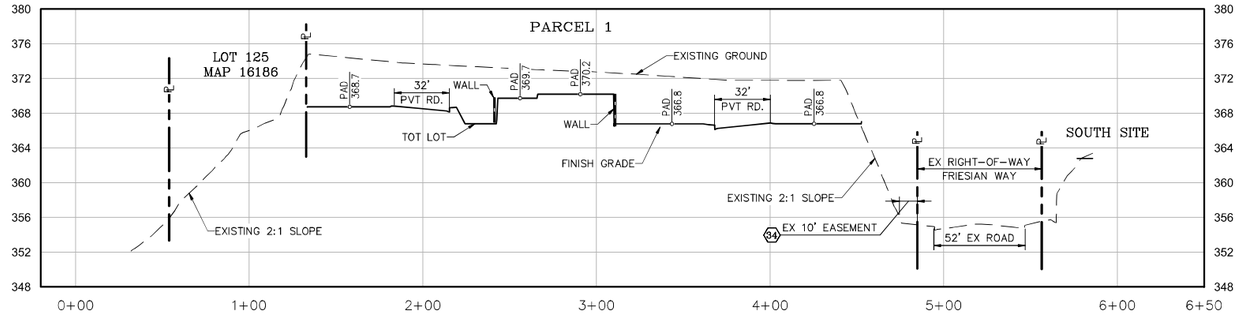
SHEET NO.
7 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg



NORTH SITE - E-W SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



NORTH SITE - N-S SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R.E.C
Consultants, Inc.

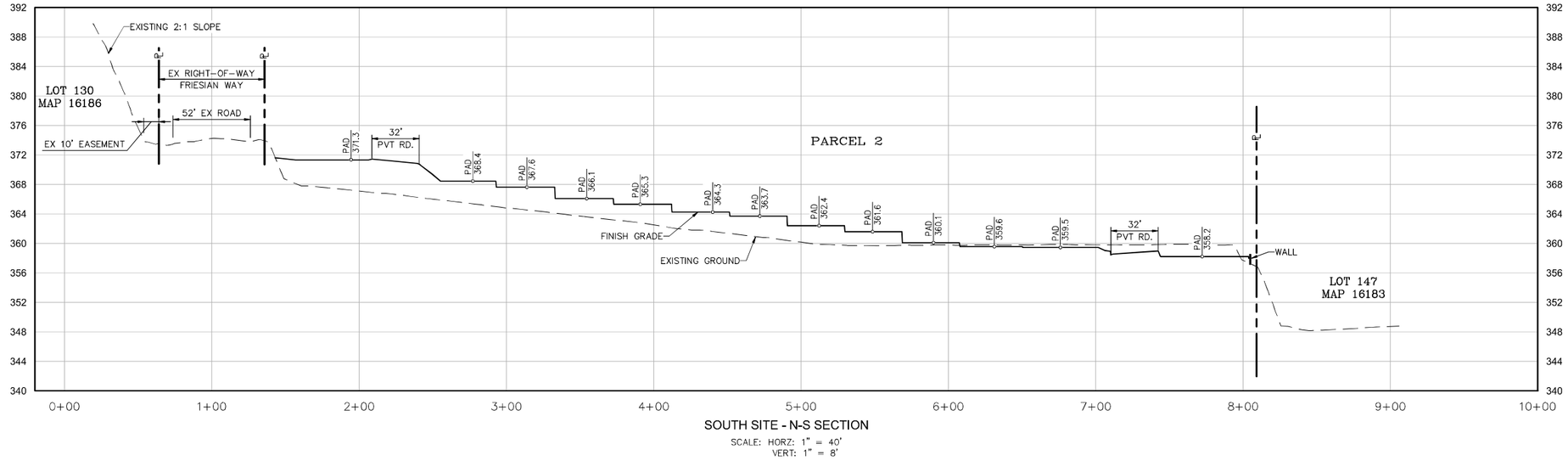
REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

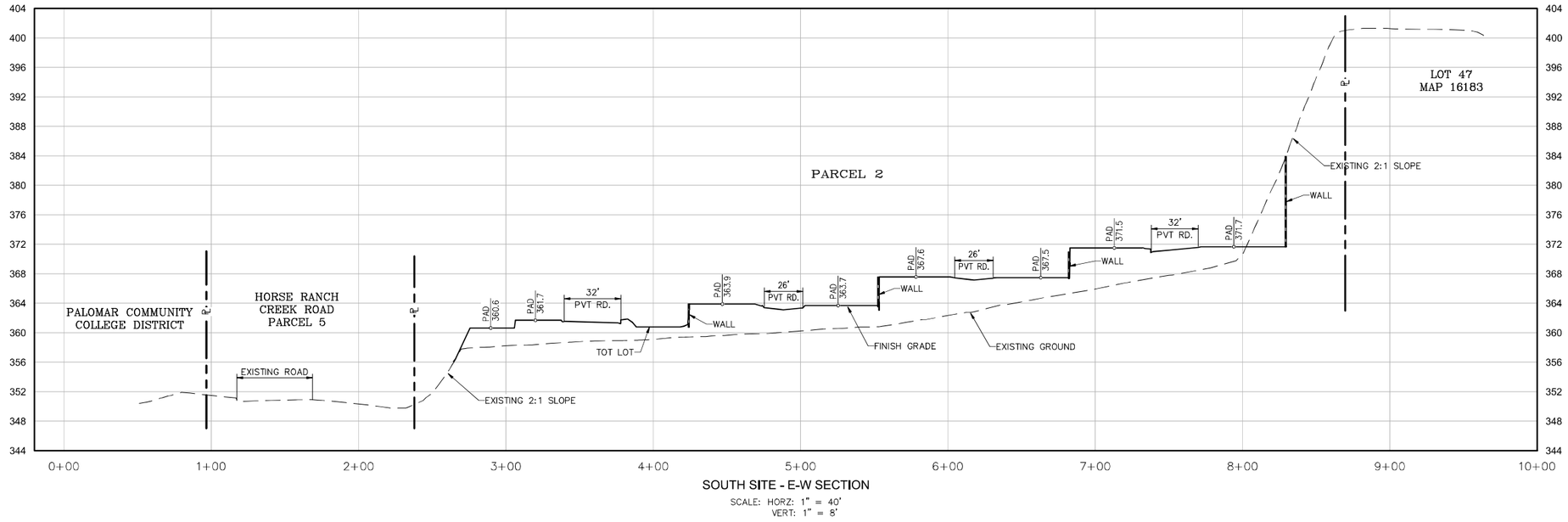
PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. _____
County of San Diego, California

SHEET NO.
8 OF 18



SOUTH SITE - N-S SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



SOUTH SITE - E-W SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

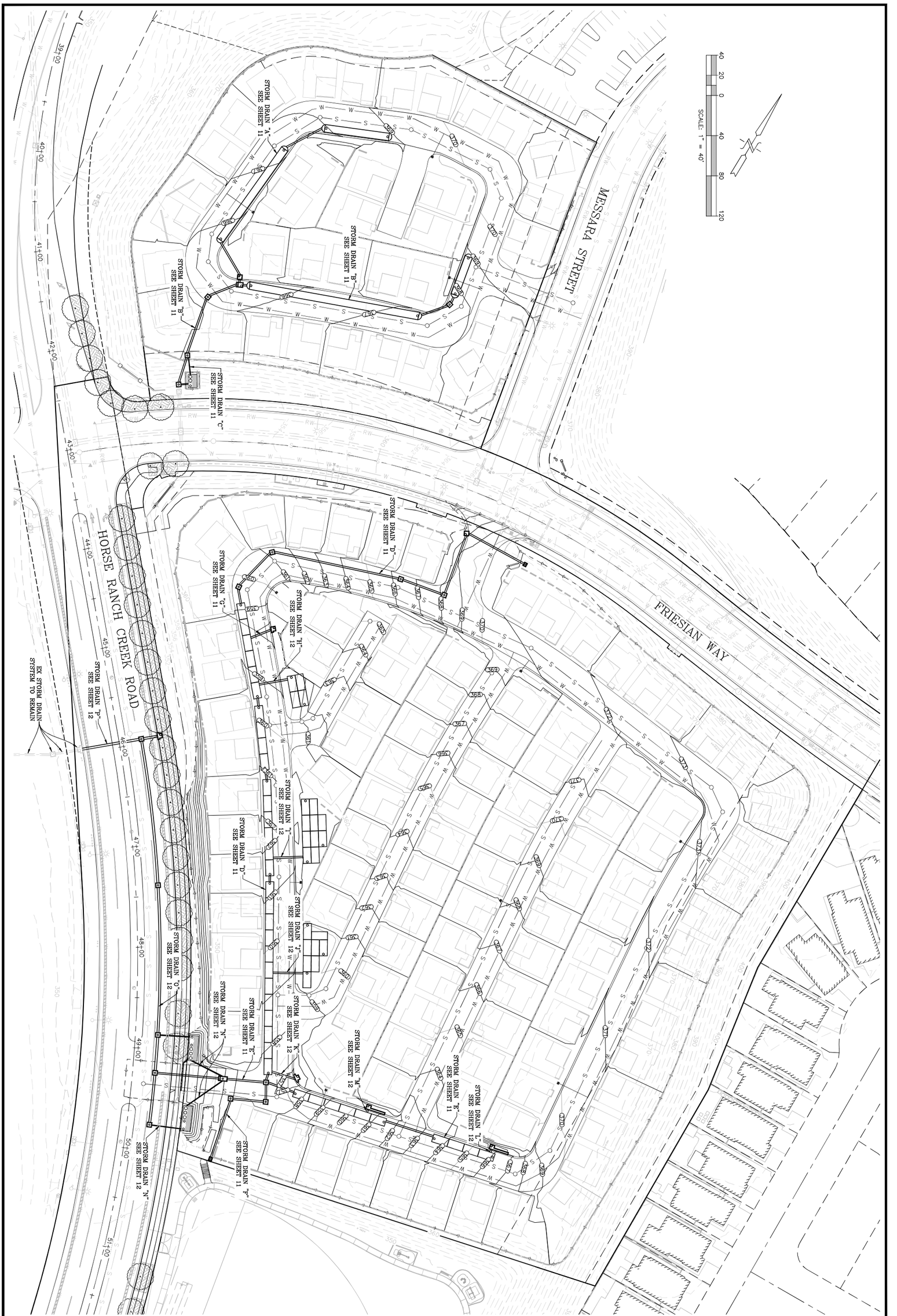
Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R.E.C
Consultants, Inc.

REVISIONS		
BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg



SAVE DATE: 8/11/2023 - PLOT DATE: 8/11/2023 - FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

SHEET NO. 10 OF 18

PRELIMINARY GRADING PLAN

PASSERELLE

COUNTY OF SAN DIEGO TRACT NO. ____

County of San Diego, California

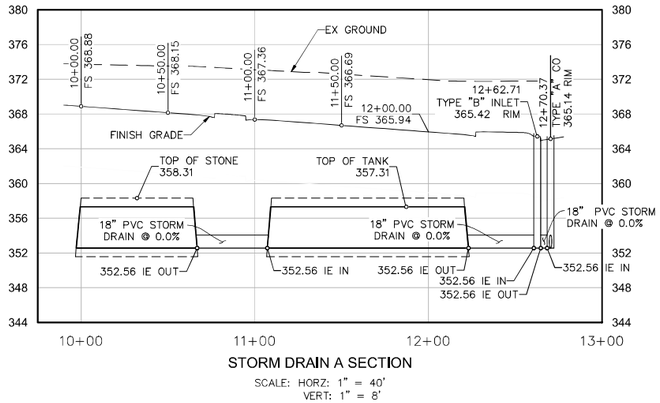
JOB NO. 1581

REVISIONS		
BY	DATE	DESCRIPTION

R·E·C Consultants, Inc.

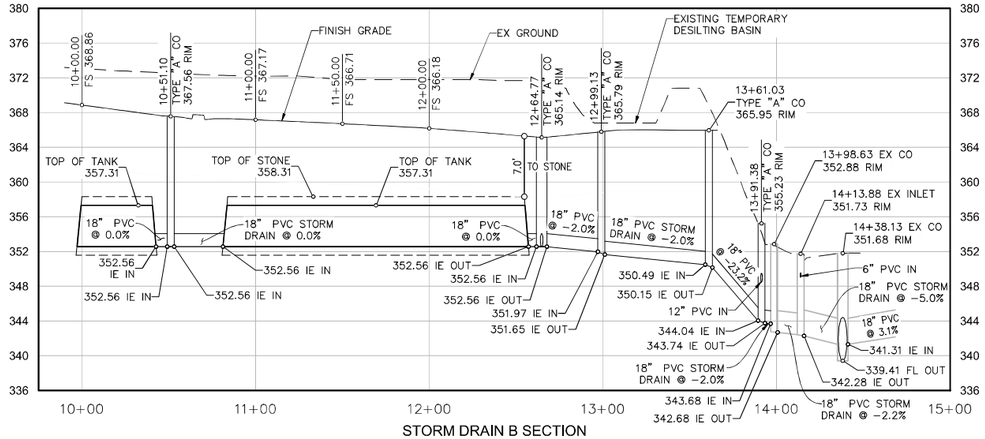
Civil Engineering • Environmental

2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax



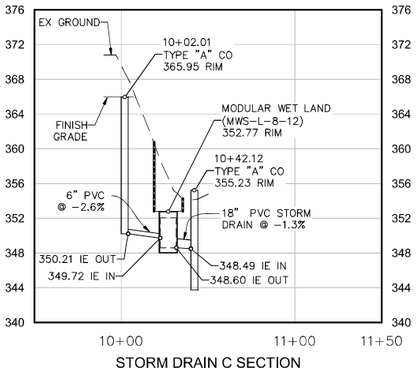
STORM DRAIN A SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



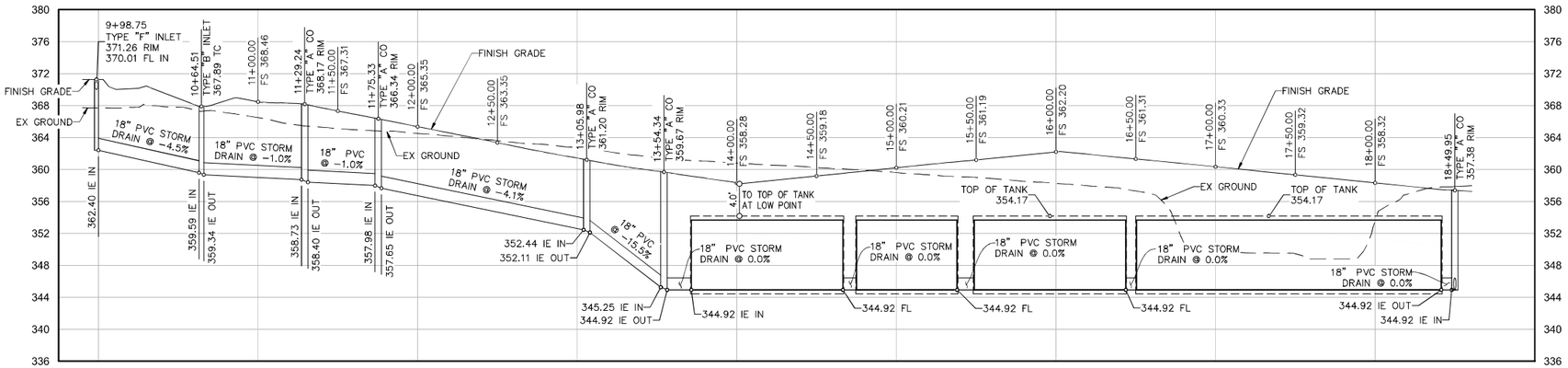
STORM DRAIN B SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



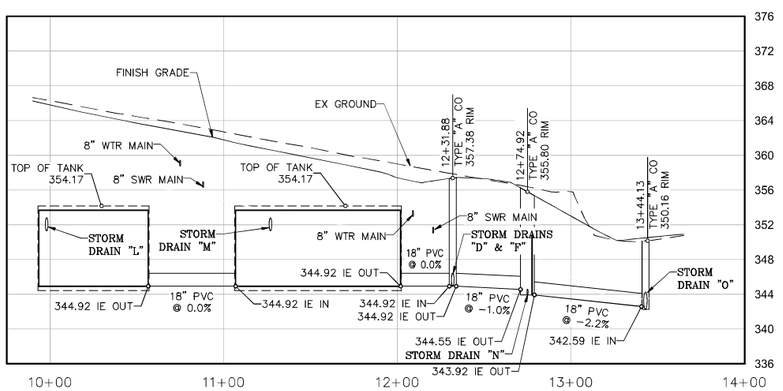
STORM DRAIN C SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



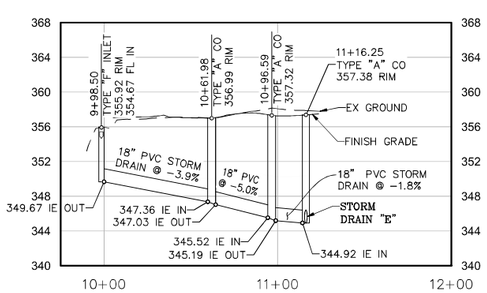
STORM DRAIN D SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



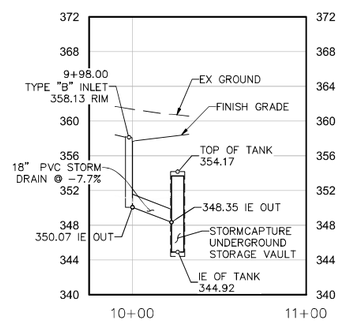
STORM DRAIN E SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



STORM DRAIN F SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



STORM DRAIN G SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R.E.C Consultants, Inc.

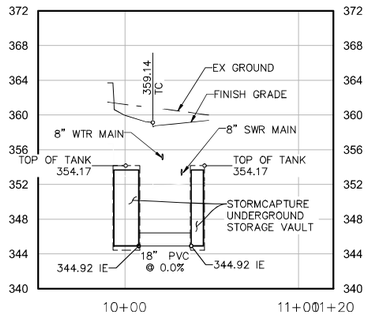
REVISIONS		
BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. _____
County of San Diego, California

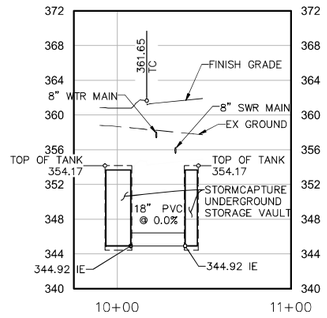
SHEET NO.
11 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg



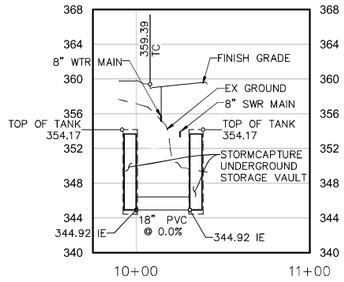
STORM DRAIN H SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



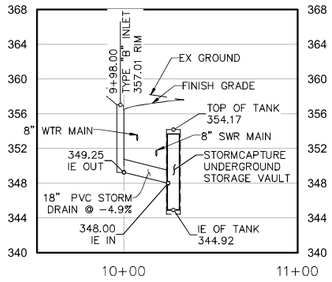
STORM DRAIN I SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



STORM DRAIN J SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'



STORM DRAIN K SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

STORM DRAIN L SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

STORM DRAIN M SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

STORM DRAIN N SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

STORM DRAIN O SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

STORM DRAIN P SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 8'

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C
Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
12 OF 18

LEGEND

ITEM	CALTRANS #	SYMBOL
RIPRAP ENERGY DISSIPATOR	SS-10	
SILT FENCE	SE-1	
STORM DRAIN INLET PROTECTION	SE-10	
GRAVEL BAGS	SE-6, SE-8	
DRAINAGE SWALE		
STABILIZED CONSTRUCTION ENTRANCE	TC-1	
FIBER ROLL:	SE-5	FR FR

ITEM	CALTRANS #	SYMBOL
MATERIAL DELIVERY & STORAGE:	WM-1	WM-1
STOCKPILE MANAGEMENT:	WM-3	WM-3
SPILL PREVENTION AND CONTROL:	WM-4	WM-4
SOLID WASTE MANAGEMENT:	WM-5	WM-5
HAZARDOUS WASTE MANAGEMENT:	WM-6	WM-6
CONCRETE WASTE MANAGEMENT:	WM-8	WM-8
SANITARY WASTE MANAGEMENT:	WM-9	WM-9
WATER CONSERVATION PRACTICES:	NS-1	NS-1
PAVING AND GRINDING OPERATIONS:	NS-3	NS-3
VEHICLE AND EQUIPMENT MAINT.	NS-10	NS-10
STREET SWEEPING AND VACUUMING:	SE-7	SE-7
HYDRAULIC MULCH:	SS-3	SS-3
HYDROSEEDING:	SS-4	SS-4
PAD STABILIZATION:	SS-5	SS-5

40 20 0 40 80 120

SCALE: 1" = 40'

MESSARA STREET

FRIESIAN WAY

HORSE RANCH CREEK ROAD

STABILIZED CONSTRUCTION ENTRANCE TC-1

STABILIZED CONSTRUCTION ENTRANCE TC-1

UNDERGROUND STORM WATER STORAGE TANK

UNDERGROUND STORM WATER STORAGE TANK

WATER QUALITY MODULAR WETLAND

CONNECT TO EXISTING STORM DRAIN SYSTEM

WATER QUALITY MODULAR WETLAND

STABILIZED CONSTRUCTION ENTRANCE TC-1

CONNECT TO EXISTING STORM DRAIN SYSTEM

Civil Engineering • Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R.E.C
Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

PRELIMINARY GRADING PLAN ~ BMP PLAN

PASSERELLE

COUNTY OF SAN DIEGO TRACT NO. _____
County of San Diego, California

SHEET NO.
13 OF 18

SAVE DATE: 8/17/2023 ~ PLOT DATE: 8/17/2023 ~ FILE NAME: P:\Acad\1581 Campus Park Condo\Civil\Preliminary Grading Plan\Preliminary Grading Plan.dwg

LEGEND

- EX. STORM DRAIN
- PROP. STORM DRAIN
- EX. INLET/CATCHBASIN/CLEANOUT
- DRAINAGE MANAGEMENT AREA BOUNDARY
- DRAINAGE DIRECTION
- PROP. INLET/CATCHBASIN/CLEANOUT

SITE DESIGN BMPS

- [SC-1] PREVENTION OF ILLICIT DISCHARGES INTO THE MS4
- [SC-5] PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
- [SC-6D1] NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- [SC-6D2] LANDSCAPE/OUTDOOR PESTICIDE USE
- [SC-6G] REFUSE AREAS
- [SC-6N] FIRE SPRINKLER TEST WATER
- [SC-6O] MISCELLANEOUS DRAIN OR WASH WATER
- [SC-6Q] PLAZAS, SIDEWALKS, AND PARKING LOTS

SOURCE CONTROL BMPS

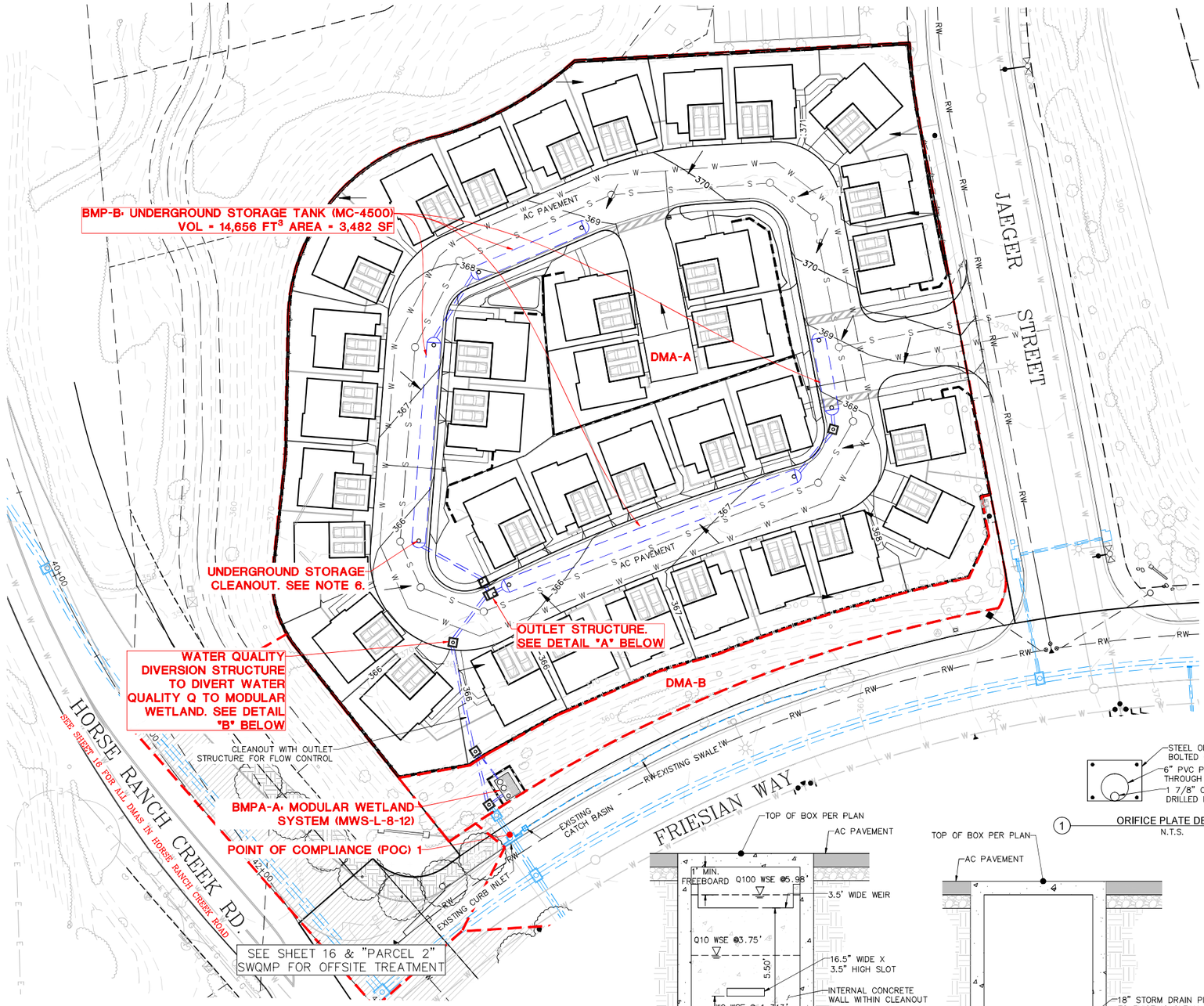
- [SD-3] MINIMIZE IMPERVIOUS AREA
- [SD-4] MINIMIZE SOIL COMPACTION
- [SD-5] IMPERVIOUS AREA DISPERSION
- [SD-6] RUNOFF COLLECTION
- [SD-7] LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

POST-CONSTRUCTION BMPS

- MODULAR WETLAND SYSTEM (BF-3)
- UNDERGROUND STORAGE TANK

NOTES

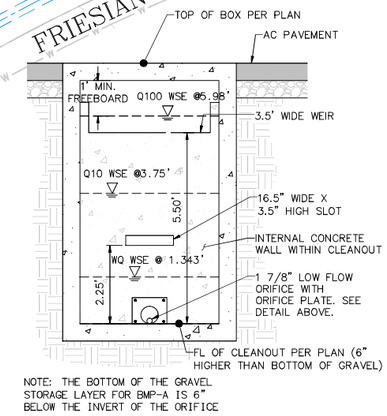
1. CCSYA: NONE. SEE EXHIBIT IN ATTACHMENT 9
2. HYDROLOGIC SOIL GROUP: TYPE C PER COUNTY SOIL MAP
3. APPROXIMATE DEPTH TO GROUNDWATER: >10' (PREGRADED LOT)
4. EXISTING HYDRAULIC FEATURES: NONE
5. EACH UNIT ASSUMED TO HAVE A 32'X10' MINIMUM IMPERVIOUS PATIO (NOT SHOWN)
6. UNDERGROUND STORAGE MAINTENANCE ACCESS VIA CLEANOUT.



30 15 0 30 60 90

SCALE: 1" = 30'

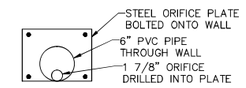
DMA & BMP SUMMARY TABLE								
DMA	DMA TYPE	BMP	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)
A	DRAINS TO BMP	BMP-A: MODULAR WETLAND SYSTEM (BF-2) & BMP-B: UNDERGROUND STORAGE TANK	119,764	2.749	91,623	2.103	28,141	0.646
B	SELF-MITIGATING	N/A	8,497	0.195	0	0.000	8,497	0.195
TOTAL			128,261	2.944	91,623	2.103	36,638	0.841



NOTE: THE BOTTOM OF THE GRAVEL STORAGE LAYER FOR BMP-A IS 6" BELOW THE INVERT OF THE ORIFICE

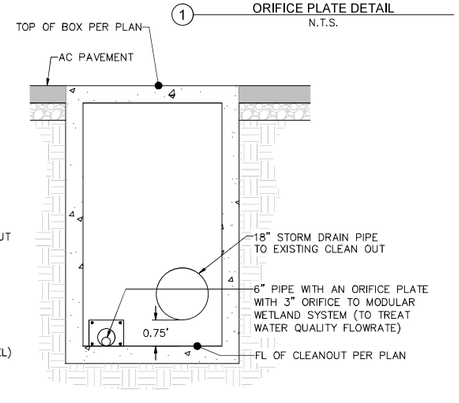
A OUTLET STRUCTURE

SCALE: 1"=2'



1 ORIFICE PLATE DETAIL

N.T.S.



B WQ DIVERSION STRUCTURE

SCALE: 1"=2'

Civil Engineering • Environmental
2970 FIFTHE AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R.E.C Consultants, Inc.

REVISIONS

BY	DATE	DESCRIPTION

JOB NO. 1581

POST DEVELOPED DMA & HMP EXHIBIT
PASSERELLE (PARCEL 1)
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

LEGEND

- EX. STORM DRAIN
- PROP. STORM DRAIN
- EX. INLET/CATCHBASIN/CLEANOUT
- DRAINAGE MANAGEMENT AREA BOUNDARY

SITE DESIGN BMPS

- SC-1 PREVENTION OF ILLICIT DISCHARGES INTO THE MS4
- SC-2 STORM DRAIN STENCILING OR SIGNAGE
- SC-5 PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
- SC-6A ON-SITE STORM DRAIN INLETS
- SC-6D NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- SC-6E LANDSCAPE/OUTDOOR PESTICIDE USE
- SC-6H REFUSE AREAS
- SC-6O FIRE SPRINKLER TEST WATER
- SC-6P MISCELLANEOUS DRAIN OR WASH WATER
- SC-6Q PLAZAS, SIDEWALKS, AND PARKING LOTS

SOURCE CONTROL BMPS

- SD-1 MAINTAIN NATURAL DRAINAGE PATHWAYS AND HYDROLOGIC FEATURES
- SD-3 MINIMIZE IMPERVIOUS AREA
- SD-4 MINIMIZE SOIL COMPACTION
- SD-5 IMPERVIOUS AREA DISPERSION
- SD-6 RUNOFF COLLECTION
- SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

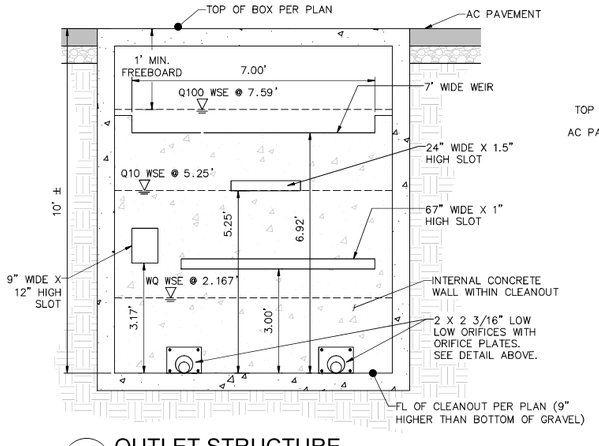
POLLUTANT CONTROL BMPS

- MODULAR WETLAND SYSTEM (BF-3)
- STORMDRAIN PIPE
- UNDERGROUND DETENTION TANK

NOTES

1. CCSYA: NONE. SEE EXHIBIT IN ATTACHMENT 9
2. HYDROLOGIC SOIL GROUP: TYPE C PER COUNTY SOIL MAP
3. THE UNDERGROUND DETENTION SYSTEM (BMP-A) IS COMPRISED OR A SERIES OF OLDCASTLE STORMCAPTURE TANKS (A = 3,072 SF, VOL = 52,704 CFT)
4. APPROXIMATE DEPTH TO GROUNDWATER: >10' (PREGRADED LOT)
5. EXISTING HYDRAULIC FEATURES: NONE
6. EACH UNIT ASSUMED TO HAVE A 32'X10' MINIMUM IMPERVIOUS PATIO (NOT SHOWN)
7. UNDERGROUND STORAGE MAINTENANCE ACCESS VIA CLEANOUT.

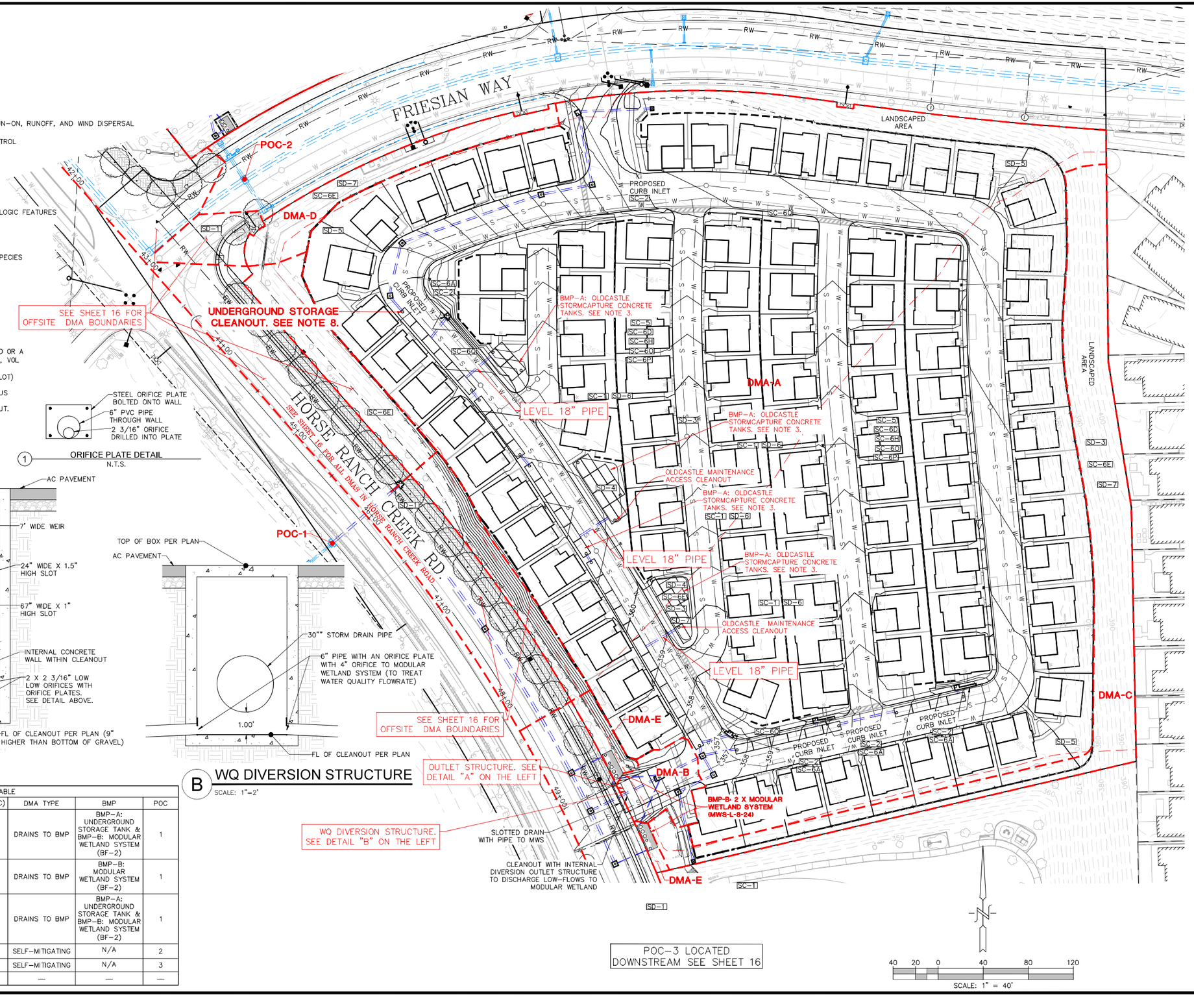
1 ORIFICE PLATE DETAIL
N.T.S.



A OUTLET STRUCTURE
SCALE: 1"=2'

B WQ DIVERSION STRUCTURE
SCALE: 1"=2'

DMA & BMP SUMMARY TABLE						
AREA	IMPERVIOUS (AC)	PERVIOUS (AC)	TOTAL AREA (AC)	DMA TYPE	BMP	POC
DM-A	5.947	1.758	7.705	DRAINS TO BMP	BMP-A: UNDERGROUND STORAGE TANK & BMP-B: MODULAR WETLAND SYSTEM (BF-2)	1
DM-B	0.061	0.030	0.091	DRAINS TO BMP	BMP-B: MODULAR WETLAND SYSTEM (BF-2)	1
DMA-C	0.003	0.615	0.618	DRAINS TO BMP	BMP-A: UNDERGROUND STORAGE TANK & BMP-B: MODULAR WETLAND SYSTEM (BF-2)	1
DMA-D	0.000	0.165	0.165	SELF-MITIGATING	N/A	2
DMA-E	0.000	0.050	0.050	SELF-MITIGATING	N/A	3
TOTAL	6.011	2.618	8.629	—	—	—



Civil Engineering • Environmental
2970 FIFTHE AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R.E.C Consultants, Inc.

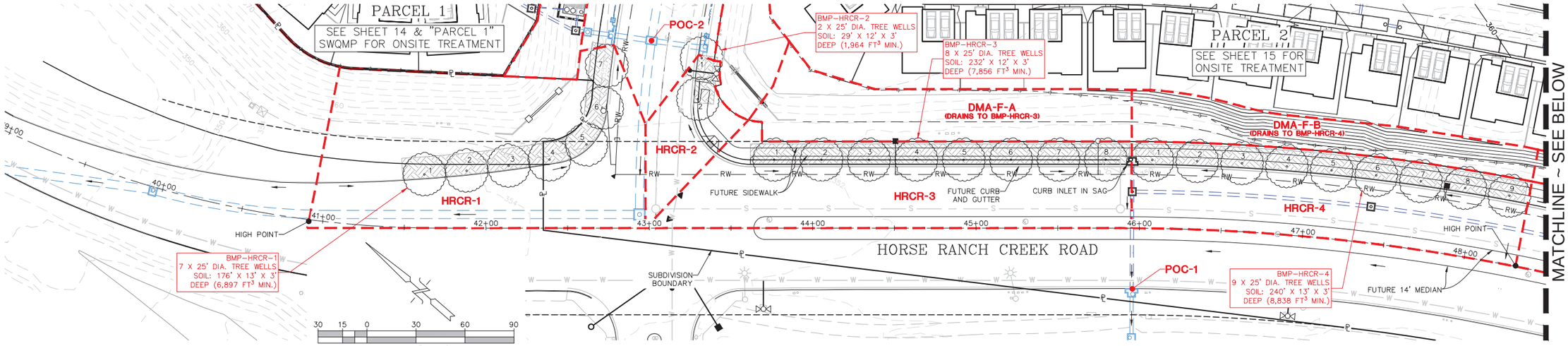
REVISIONS

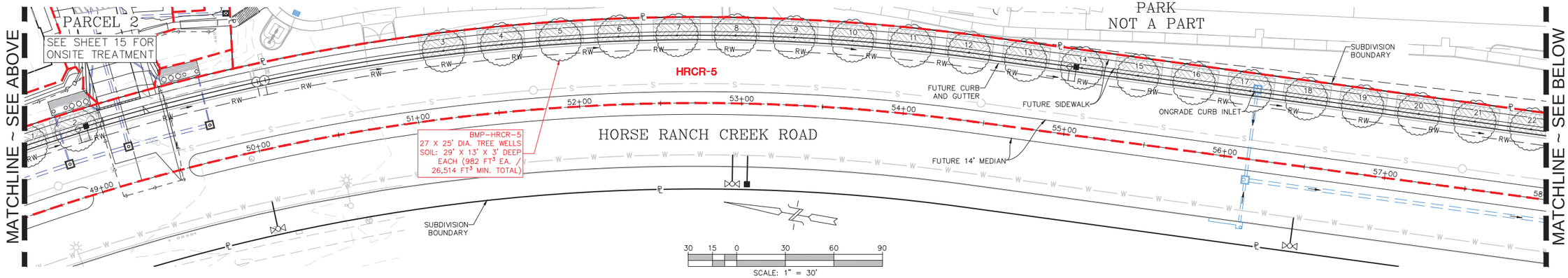
BY	DATE	DESCRIPTION

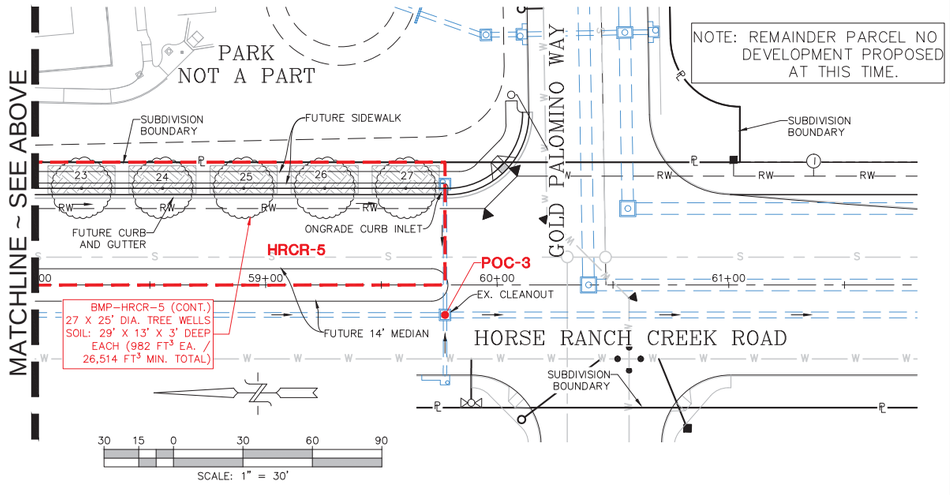
JOB NO. 1581

POST DEVELOPED DMA & HMP EXHIBIT
PASSERELLE (PARCEL 2)
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
15 OF 18







DMA & BMP SUMMARY TABLE

DMA	POC	DMA TYPE	BMP	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)
HRCR-1	1	DRAINS TO BMP	BMP-HRCR-1: Tree Well (SD-A)	18,827	0.432	8,300	0.191	10,527	0.242
HRCR-2	1	DRAINS TO BMP	BMP-HRCR-2: Tree Well (SD-A)	3,254	0.075	2,577	0.059	677	0.016
HRCR-3	2	DRAINS TO BMP	BMP-HRCR-3: Tree Well (SD-A)	14,616	0.336	10,681	0.245	3,935	0.090
DMA-F-A	2	DRAINS TO BMP	BMP-HRCR-3: Tree Well (SD-A)	7,931	0.182	0	0.000	7,931	0.182
HRCR-4	2	DRAINS TO BMP	BMP-HRCR-4: Tree Well (SD-A)	12,802	0.294	8,935	0.205	3,867	0.089
DMA-F-B	2	DRAINS TO BMP	BMP-HRCR-4: Tree Well (SD-A)	5,565	0.128	0	0.000	5,565	0.128
HRCR-5	3	DRAINS TO BMP	BMP-HRCR-5: Tree Well (SD-A)	61,406	1.410	43,575	1.000	17,831	0.409
			TOTAL	124,401	2.856	74,068	1.700	50,333	1.155

LEGEND

- EX. STORM DRAIN
- PROP. STORM DRAIN
- EX. INLET/CATCHBASIN/CLEANOUT
- DRAINAGE MANAGEMENT AREA BOUNDARY
- DIRECTION OF FLOW
- TREE WELL (SD-A)

NOTES

1. ALL TREE WELLS ARE PER SAN DIEGO COUNTY DEPARTMENT OF PUBLIC WORKS GREEN STREET STANDARD DRAWING GS-1.02. SEE DETAIL ON SHEET 18
2. TREE WELLS TO HAVE STRUCTURAL SOIL.
3. THE ULTIMATE ROAD IMPROVEMENTS AND STORMWATER TREATMENT OF THE ROAD WILL BE SHOWN IN FUTURE DEVELOPMENT PROPOSALS FOR THE REMAINDER PARCEL.

Civil Engineering • Environmental
2970 FIFTH AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS

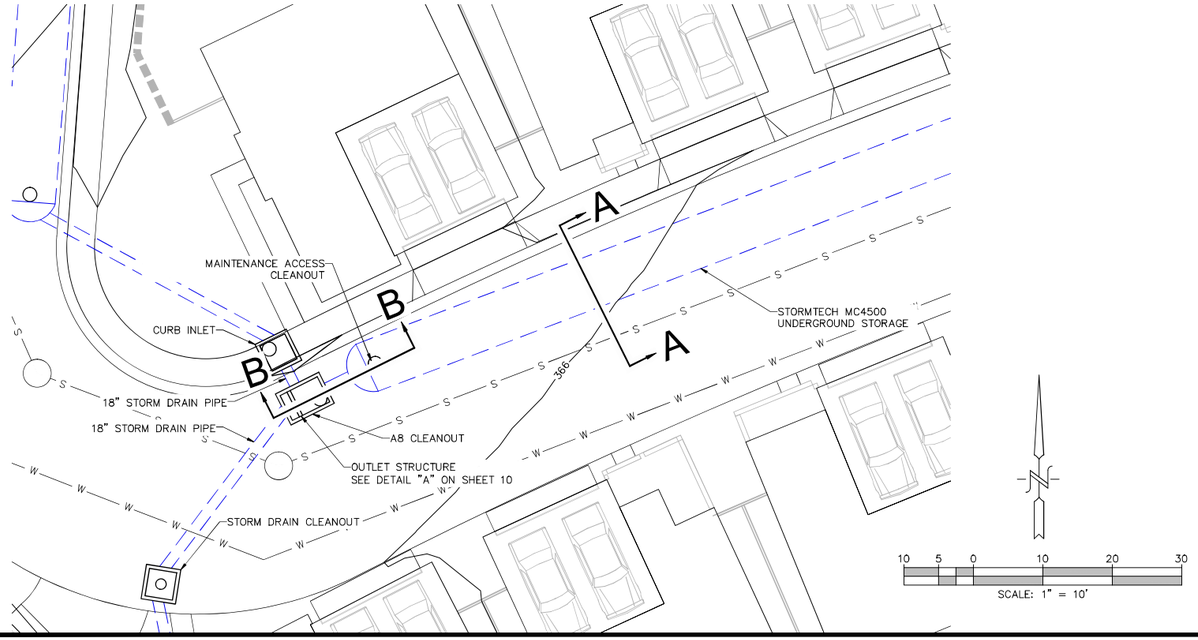
BY	DATE	DESCRIPTION

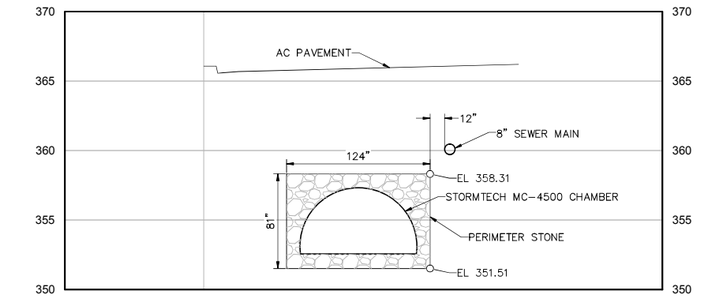
JOB NO. 1581

POST DEVELOPED DMA & HMP EXHIBIT
PASSERELLE
COUNTY OF SAN DIEGO TRACT NO. _____
County of San Diego, California

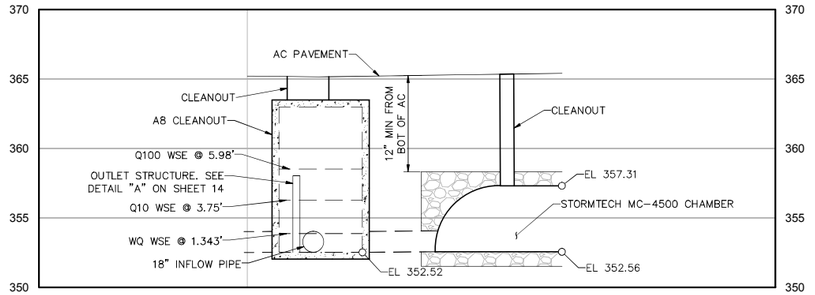
SHEET NO.
16 OF 18

PARCEL 1 ~ BMP SECTIONS

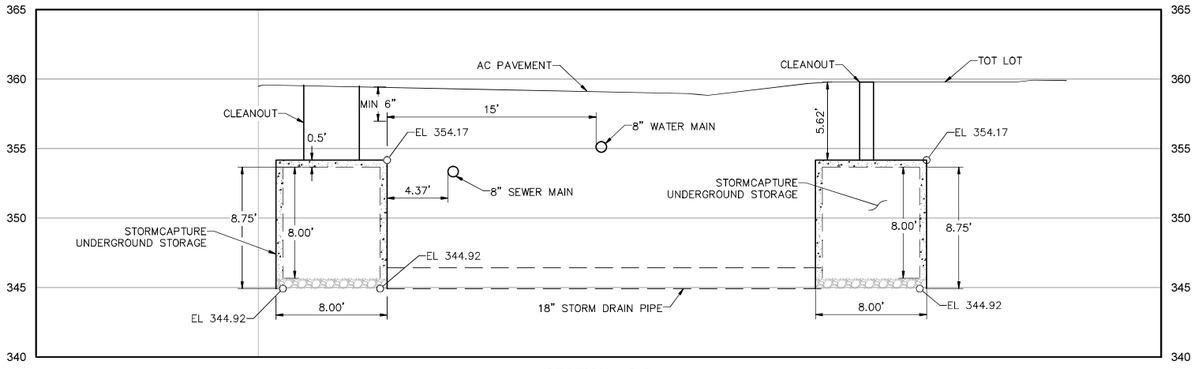




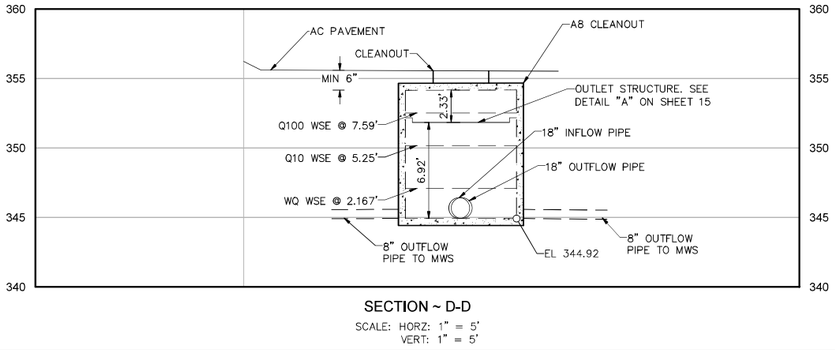
SECTION ~ A-A
SCALE: HORZ: 1" = 5'
VERT: 1" = 5'



SECTION ~ B-B
SCALE: HORZ: 1" = 5'
VERT: 1" = 5'



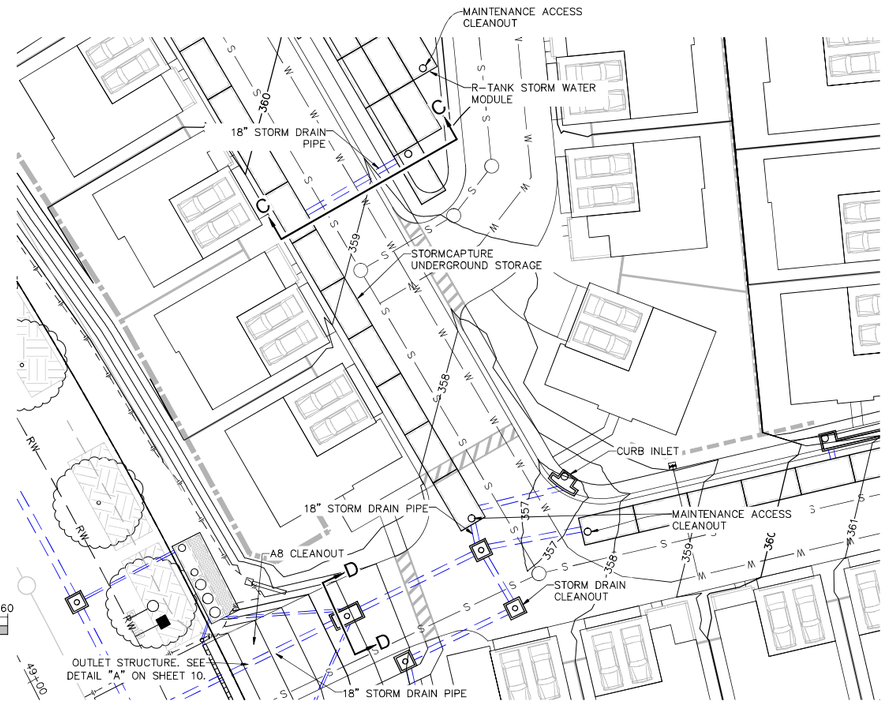
SECTION ~ C-C
SCALE: HORZ: 1" = 5'
VERT: 1" = 5'



SECTION ~ D-D
SCALE: HORZ: 1" = 5'
VERT: 1" = 5'

20 10 0 20 40 60
SCALE: 1" = 20'

PARCEL 2 ~ BMP SECTIONS



Civil Engineering • Environmental
2970 FIFTHE AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R.E.C Consultants, Inc.

REVISIONS | BY | DATE | DESCRIPTION

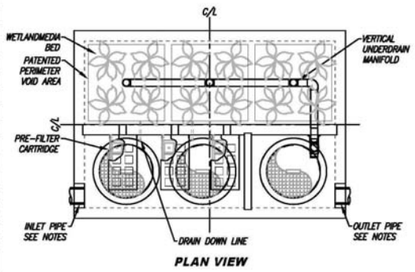
JOB NO. 1581

POST DEVELOPED CROSS SECTION DETAILS
PASSERELLE (PARCELS 1&2)
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

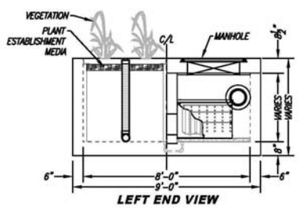
SHEET NO.
17 OF 18

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
FLOW BASED (CFS)			
0.345			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
NOTES:			

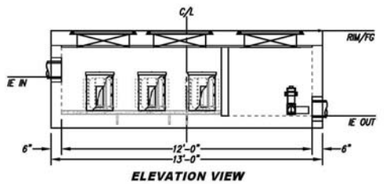
* PRELIMINARY NOT FOR CONSTRUCTION



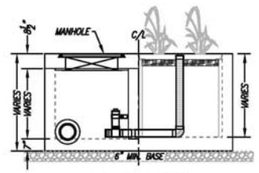
PLAN VIEW



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 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

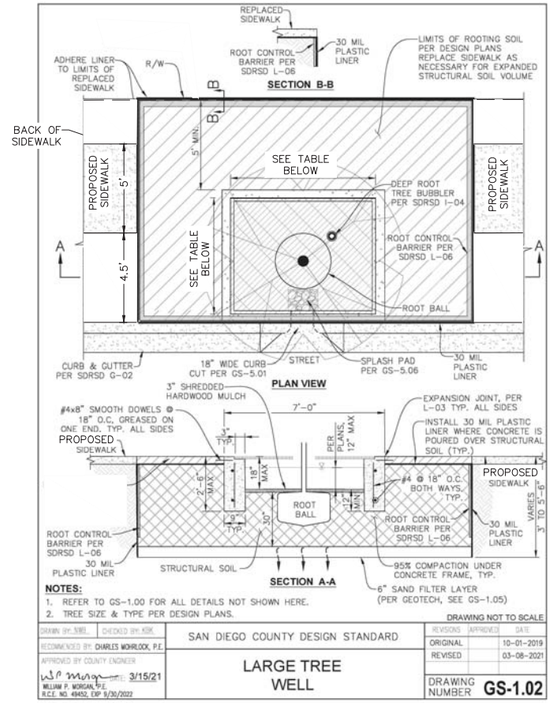
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT CONTECH.

TREATMENT FLOW (CFS)	0.345
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.9

MODULAR WETLANDS — FOR PROJECT SPECIFIC INFORMATION, GO TO www.ContechES.com/mws

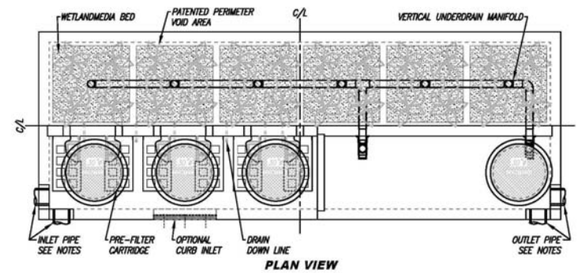
CONTECH ENGINEERED SOLUTIONS LLC www.ContechES.com

MWS-L-8-12-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

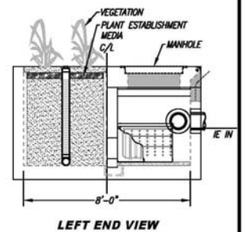


TREE WELL DIMENSIONS					
DMA	HRCR-1	HRCR-2	HRCR-3	HRCR-4	HRCR-5
LENGTH (FT)	26.0	20.0	29.0	29.0	29.0
WIDTH (FT)	13.0	16.5	12.0	12.0	12.0
DEPTH (FT)	3.0	3.0	3.0	3.0	3.0

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



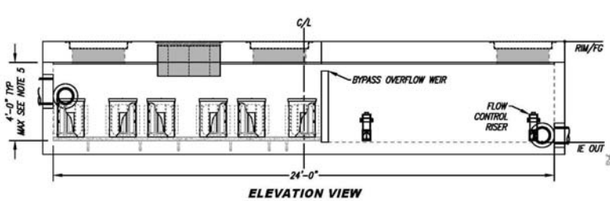
PLAN VIEW



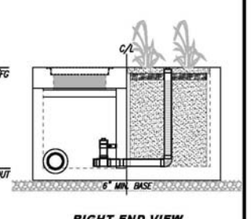
LEFT END VIEW

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 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.



ELEVATION VIEW



RIGHT END VIEW

MODULAR WETLANDS — FOR PROJECT SPECIFIC INFORMATION, GO TO www.ContechES.com/mws

CONTECH ENGINEERED SOLUTIONS LLC www.ContechES.com

MWS-L-8-24-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

Civil Engineering • Environmental
2970 FIFTH AVENUE, SUITE 340
SAN DIEGO, CA 92103
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

REVISIONS | BY | DATE | DESCRIPTION

JOB NO. 1581

MODULAR WETLANDS STANDARD DETAILS
PASSERELLE (PARCELS 1&2)
COUNTY OF SAN DIEGO TRACT NO. ____
County of San Diego, California

SHEET NO.
18 OF 18

5.0 General Requirements

- Each Priority Development Project (PDP) must provide a description of existing site conditions and proposed changes to them, including changes to topography and drainage.
- Has a **Drainage Report** has been prepared for the PDP?

  ☒ **Yes**

  - Review of the Drainage Report must be concurrent with the PDP SWQMP.
  - Include the summary page of the Drainage Report with this cover page, and provide the following information:

    Title: Preliminary Drainage Study For Passerelle Tentative Map (Parcel 1)

    Prepared By: REC Consultants, Inc.

    Date: March 1, 2021

  - Do not complete the rest of this attachment (also exclude these additional pages from your submittal). Additional documentation of site and drainage conditions is not required unless requested by County staff.

  ☐ **No** -- Complete and submit the remainder of this attachment below.

PRELIMINARY DRAINAGE STUDY
FOR
Passerelle Tentative Map (Parcel 1)

TM _____

(Vacant) Horse Ranch Creek Road

Fallbrook, CA 92028

(APN 108-120-62)

Prepared for:

Passerelle, LLC

10531 4S Commons Dr # 700

San Diego, CA 92127

Prepared by:

REC Consultants, Inc.

2970 Fifth Avenue, Suite 340

San Diego, CA 92103

(619) 232-9200

Prepared March 1, 2021

Revised: September 30, 2022

Table of Contents

Declaration of Responsible Charge

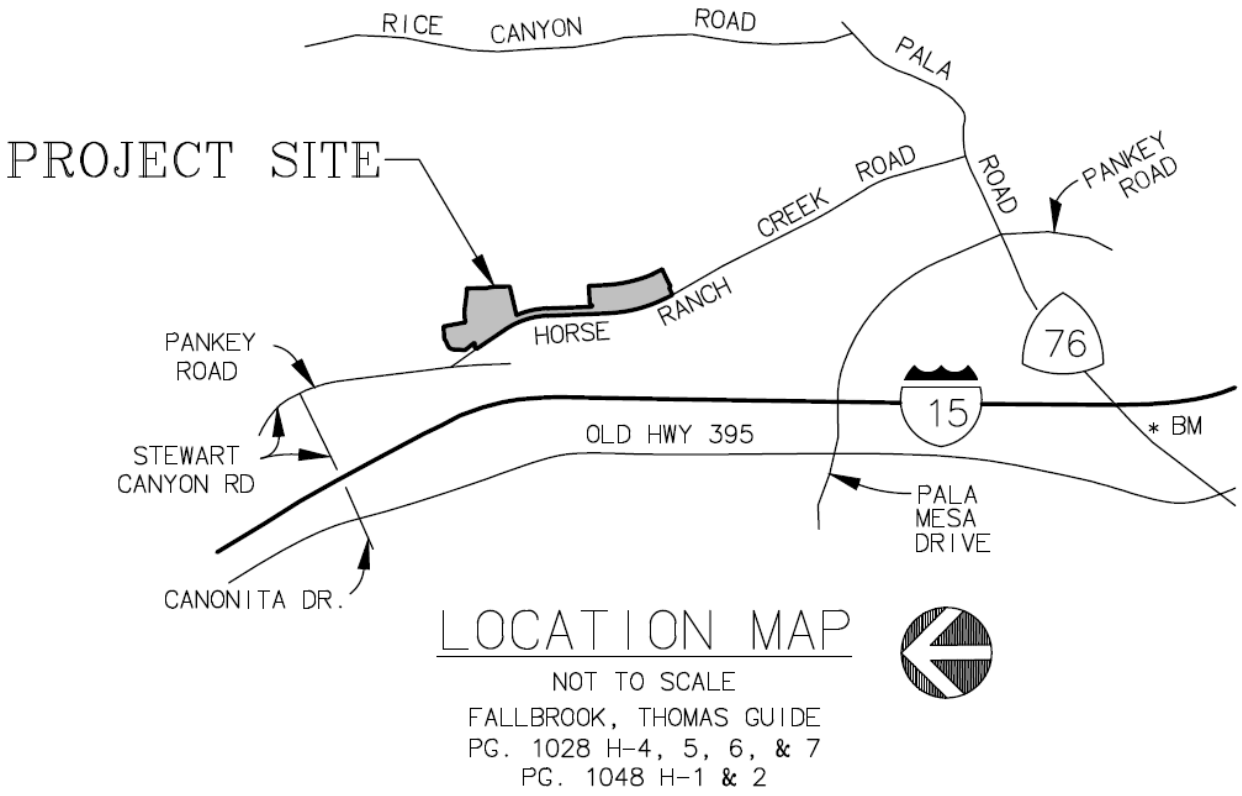
I, declare that I am the Civil Engineer of Work for this Drainage Study, that I have exercised responsible charge over the preparation of said study as defined in section 6703 of the Business and Professions Code, and that the recommendations are consistent with current standards.

I understand the check of this Drainage Study by the County of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities.

_____

William O'Gorman, RCE 88286, EXP. 3-31-23 Date

Vicinity Map



1.0 Introduction

The original approved Campus Park project (Vesting Tentative Map 5338 RPL-7) is a 416.1-acre planned community composed of multi-family and single family residential neighborhoods, a neighborhood commercial town center, professional office uses, parks and recreational facilities, and preservation of open space areas and trails. The Campus Park Multi-Family project will amend the Campus Park project to allow for the development of two multi-family condominium lots (Parcel 1 and Parcel 2). Parcel 1, located on Assessor's Parcel Number (APN) 108-120-62, is comprised of 3.02 acres and Parcel 2, located on APN 108-120-61, is comprised of 8.94 acres and were both originally designated for professional office (PO-1 and PO-2) uses in the Specific Plan. Only Parcel 1 will be analyzed herein while Parcel 2 will be analyzed in a separate Preliminary Drainage Study. Parcel 1 is bound to the west by Horse Ranch Creek Road, to the east by Jaeger Street and to the south by Friesian Way. Thirty five detached multi-family residences with a drive aisle is proposed. See the Tentative Map in **Appendix A.**

2.0 Hydrologic Description

2.1 Pre-Developed Condition

The pad has been previously graded and the improvements on Friesian Way and Jaeger Street built as part of the original Campus Park project. The site is mostly dirt with the entire pad gently sloping (approximately 1% slope) to the south west corner to a desilting basin. The entire site is type-C soil according the USGS Web Soil Survey. There will only drainage basin in the predeveloped condition. Basin 1 contains the entirety of the existing pad as well as the vegetated slope on the south and east side of the pad. Runoff from the desilting basin flows to an existing curb inlet located on Frisian way via a storm drain pipe. The Point of Comparison (POC) will be located at the curb inlet.

2.2 Post-Developed Condition

As mentioned above, the owner is proposing to build 35 single family residences and a drive aisle on a previously graded lot. The existing desilting basin will be removed and an underground storage tank will be constructed. This underground storage tank will be used for hydromodification flow control and peak 100-year flow attenuation. The site will be broken into two drainage basins in the post-developed condition. Basin 1 consists of all onsite areas flowing

to the underground storage tank. Runoff within basin 1 will flow southerly to a to a curb inlet located at a low point prior to discharging into the underground tank. Basin 2 consists of the existing vegetated slopes on the south, east, and west sides of the pad that will largely remain unchanged. Drainage patterns will remain relatively the same and the Point of Comparison for the site will continue to be at the outlet of this storm drain pipe as it discharges into the curb inlet. See the attached Hydrology Maps in **Appendix B**.

3.0 Hydrologic Methodology and Results

The hydrologic analysis is done to assess the impact of the proposed improvements on the existing drainage patterns and any increase to 100-year peak flowrates that will require mitigation. The projects major drainage basins are divided into minor sub basins based on changes in grade, conveyance geometry and run-off coefficients along the drainage paths. The project's 100-year peak flowrates for the existing and unmitigated post-developed conditions were analyzed using CIVILCADD/CIVILDESIGN Engineering Software Version 7.9 (CivilD) developed by CivilDesign Corporation. The software is a computer application of the modified rational method in accordance with the County of San Diego Flood Control District's Hydrology Manual (2003).

3. 1 100-Year Existing Condition

The below table summarizes the pre-developed runoff at key points. The full computer output file is titled "1581Parcel1Pre" and is found in **Appendix C.**

Table 1: 100-Year Existing Condition Summary Table

Node	Description	Effective C	Tc (min.)	I (in/hr)	Area (ac)	Q_{peak} (cfs)
1.031	Runoff at POC 1	-	14.342	4.673	2.94	**4.132**

3.2 100-Year Unmitigated Developed Condition

The below table summarizes the unmitigated post-developed runoff at key points. The full computer output file is titled "1581Parcel1Post" and is found in **Appendix D.**

Table 2: 100-Year Unmitigated Developed Condition Summary Table

Nodes	Description	Effective C	Tc (min.)	I (in/hr)	Area (ac)	Q_{peak} (cfs)
1.023	Runoff to underground storage (BMP-B)	0.83	7.15	7.33	2.750	15.71
1.025	Runoff at POC 1	-	7.314	7.215	2.95	**16.144**

4.0 Detention Routing & Mitigated Condition Analysis

4.1 Modified Puls Detention Routing

The Modified Puls Method (also called Storage Indication Method) has been used to determine the resulting hydrograph after routing takes place in the underground tank. The Modified Puls Method (including infiltration) can be written as:

$$\frac{(I_1+I_2)}{2}\Delta t - \frac{(O_1+O_2)}{2}\Delta t - \frac{(f_1+f_2)}{2}\Delta t = S_2 - S_1 \quad (4)$$

which is equivalent to:

$$2\frac{S_2}{\Delta t} + O_2 = 2\frac{S_1}{\Delta t} - O_1 + I_1 + I_2 - f_1 - f_2 \quad (5)$$

In equation (5) all the right hand side terms are known. I_1 , I_2 are the inflow are the start and end of the time interval (cfs), O_1, O_2 are the outflow at the start and end of the time interval (cfs), f1, f2 are the infiltration values at the start and end of the time interval (cfs), and S_1, S_2 are the stage values at the start and end of the time interval (cu-ft). The time interval is 2 min for the 6 hr storm.

The Modified Green-Ampt Equation to model infiltration has been used (including influence of ponding water to increase infiltration). To simplify the modeling effort, Green-Ampt has been limited to the bottom area only, and the suction front effect has been ignored. The resulting equation is:

$$f = \frac{K}{43200}\left[1 + (\phi - \theta_i)\left(\frac{h - S_f}{F}\right)A_i\right] \quad (6)$$

The suction front influence has been neglected (Sf = 0); the saturated hydraulic conductivity of the natural soil (K, in/hr) has been assumed equal to 0.1875 in/hr (0.075 in/hr for compacted type c soil divided by the void ratio of 0.4). The effect of the depth of the water over the infiltrating soil (h, ft) multiplied by the area of infiltration (Ai) which is equal to the bottom of the gravel

multiplied by the void ratio and divided by the total accumulated infiltration volume F, enhances the saturated hydraulic conductivity effect. Finally the difference between porosity φ and initial moisture content θi has been assumed as 0.2 for modeling purposes.

The Modified Puls routing also requires the stage vs. elevation table, and the discharge vs. elevation table. Volume vs elevation is calculated with the datum h = 0 corresponding to the bottom of the gravel layer. Note that the routing was started with an initial depth of 0.5' (elevation of the lowest outlet) to allow for ponding for water quality. Discharge vs elevation considers orifices & slots (using the weir or orifice equation depending if the outlet is working as a weir or as an orifice) and the riser (using the weir equation as the depth of the water at crest elevation does not floods the riser and it always works as a weir).

The runoff from the project site will be detained in an ADS MC-4500 placed under the proposed drive aisle. The full modified puls routing can be found in **Appendix E**. A summary of the BMP routing results is below:

Table 3: BMP Summary Table

BMP	BMP Area (ft^2)	Max. Depth (ft)	Peak Depth (ft)	Max. Storage (ac-ft)	Peak Storage (ac-ft)	Q_{in} (cfs)	Q_{out} (cfs)
BMP-B: Underground Tank (1.023)	4,180(1)	6.75	5.97	0.404	0.375	15.71	3.66

(1) The BMP area corresponds to the bottom area of the gravel.

Table 4: BMP Outlet Summary

BMP	Orifice		Slot 1		Overflow Weir	
	Diam. (in)	Elev. (ft)	Size (in)	Elev. (ft)	Width (ft)	Elev. (ft)
BMP-B	1.875	0	16.5 (W) x 3.5 (H)	2.25	3.5	5.5

4.2 100-Year Mitigated Post-Developed Condition

The 100-year mitigated post-developed condition analysis was created by copying the unmitigated post-developed condition CivilD file and replacing all nodes upstream from the proposed underground tank with a user-defined flow with a 100-year peak flow rate and time of concentration of the underground tank discharge. The full computer output file is titled "1581Parcel1Mit" and is found in **Appendix F.**

Table 5: 100-Year Mitigated Developed Condition Summary Table

Nodes	Description	Effective C	Tc (min.)	I (in/hr)	Area (ac)	Q_{peak} (cfs)
1.023	Outflow from underground storage (BMP-B)	0.83	14.29	4.68	2.750	3.66
1.025	Runoff at POC 1	-	14.33	4.676	2.95	**3.94**

4.3 Outlet Structure Emergency Overflow

An outlet structure is proposed downstream of the underground storage tanks. Inside the outlet structure, there is a 3.5 ft wide weir to control flows. In case of an emergency the weir is designed for the unmitigated developed flow rate of 15.71 cfs. The weir equation can be utilized to ensure there is sufficient head above the weir to convey the bypass flow:

$$Q = C\ x\ L\ x\ H^{1.5}$$

Where Q is flow rate (cfs), C is the weir coefficient of 3.1, L is the weir width (ft) and H is the head above the weir (ft). Since Q and L are known, solving for the height above the crest of the weir is:

$$H = \sqrt[1.5]{\frac{Q}{C\ x\ L}} = \sqrt[1.5]{\frac{15.71\ cfs}{3.1\ x3.5\ ft}} = 1.28\ ft\ above\ the\ crest\ of\ the\ weir$$

The proposed height above the crest of the weir is 1.67 ft which is greater than the required 1.28 ft calculated above. Therefore, in case of an emergency situation, the outlet structure has the necessary capacity. Downstream of the cleanout, the flow enters a storm drain pipe which will be adequately sized in final engineering for the calculated unmitigated Q100 using Civil-D.

5.0 Hydraulic Analysis

Nodes were placed at the upstream and downstream ends of any proposed storm drains, brow ditches and gutters in the unmitigated post-developed CivilD file in order for each facility to be sized within the program. As evident from the output file, all proposed drainage features are adequately sized to convey all flows from the project.

6.0 Conclusion

With the increase in impervious ground cover, the addition of road pavement, building roofs and hardscape, the unmitigated post-development peak 100-year flow rate has increased compared to the pre-development condition. However, this increased can be mitigated through the use of an underground storage tank. A summary of the pre-developed and post-developed condition at the POC is below:

Table 6: Hydrology Summary Table

POC	POC Location	Drainage Area (ac)			Peak 100-year flowrate (cfs)		
		Existing	Developed	Change	Existing	Developed	Change
1	Existing curb inlet on Frisian Way	2.94	2.95	0.01*	4.13	3.94	-0.19

* = Minor rounding error between sub-basin areas. Actual drainage areas are the same.

As can be seen in the table above, the project will reduce the peak 100-year flow rate from 4.13 cfs in the pre-developed condition to 3.94 cfs in the mitigated post-developed condition. This reduction sufficiently demonstrates there will be no impacts downstream as a result of this development. Questions for CEQA purposes are answered below. Would the project:

A. Substantially alter the existing drainage patterns of the site or area, including through the alteration if the course of a stream or river, in a manner which would result in substantial erosion or siltation on – or off-site?

The project does not substantially alter the existing drainage pattern of the area and does not alter the course of a stream or river. The storm drain system is designed to route all resulting runoff to existing points of discharge.

B. Substantially alter the existing drainage patterns of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The project will not substantially alter the existing drainage pattern of the area as it will not alter the course of a stream or river, and also will not substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding.

C. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems?

The project will not create or contribute runoff water which would exceed the capacity of the existing storm water drainage system. All project discharge points release water at rates less than or equal to existing conditions.

D. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood insurance Rate Map or other flood hazard delineation map, including County Floodplain Maps? For example; research the foregoing and provide same (to indicate applicability or not) in the study?

The project does not place any housing within a 100-year flood hazard area.

E. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

There are no structures proposed within a 100-year flood hazard area.

F. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam on-sit or off-site?

N/A

6.0 General Requirements

- Use this attachment to document all proposed (1) self-mitigating, (2) de minimis, and (3) self-retaining DMAs. Indicate under "DMA Compliance Option" below which design options will be used to satisfy structural performance requirements for one or more DMA.

DMA Compliance Option	Required Sub-attachments	BMPDM Design Resources
☒ **Self-mitigating**	• Sub-attachment 6.1	• BMPDM Section 5.2.1
☐ **De minimis**	• Sub-attachment 6.2	• BMPDM Section 5.2.2
☐ **Self-retaining**[1]	• Sub-attachment 6.3	• BMPDM Section 5.2.3 (all options)
SSD-BMP Type(s)		
☐ **Impervious Area Dispersion**	• Sub-attachment 6.3.1	• Fact Sheet SD-B (Appendix E.8)
☐ **Tree Wells**	• Sub-attachment 6.3.2	• Fact Sheet SD-A (Appendix E.7)

- Submit this cover page and all "Required Sub-attachments" listed for each selected DMA compliance option.
- See the BMPDM sections and appendices listed under "BMPDM Design Resources" for additional explanation of design requirements. Each constructed feature must fully satisfy the requirements described in these resources, and any other guidance identified by the County.
- DMA Exhibits and Construction Plans: DMAs, features, and BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.

[1] If "Self-retaining" is selected, also choose the types of Significant Site Design BMPs (SSD-BMPs) to be used. SSD-BMPs are Site Design BMPs that are sized and constructed to fully satisfy all applicable Structural Performance Standards for a DMA.

6.1 Self-mitigating DMAs (complete this page once for ALL self-mitigating DMAs)

Self-mitigating DMAs consist of natural or landscaped areas that drain directly offsite or to the public storm drain system. These DMAs are excluded from DCV calculations.

- Provide the information requested below for each proposed self-mitigating DMA. Add rows or copy the table if additional entries are needed.

DMA #	*a. DMA Area (ft^2)*	*Incidental Impervious Area*		*Permit # and Sheet #*
		b. Size(ft^2)	*c. % (b/a*100)*	
B	8,497	0	0	Tentative Map Sheet 4

- "DMA #", "DMA Area", and "Permit # and Sheet #" are required for all DMAs listed.
- "Incidental Impervious Area" calculations are required only where applicable (see below).
- Each self-mitigating DMA must <u>fully</u> satisfy all design requirements and restrictions described in BMPDM Section 5.2.1 and any other guidance or instruction identified by the County. Check the boxes below to confirm that all required conditions are satisfied <u>for every DMA listed</u>.

☒ Each DMA is hydraulically separate from other DMAs that contain permanent storm water pollutant control BMPs.

<u>Natural and Landscaped Areas</u>

☒ Each DMA consists solely of natural or landscaped areas, except for incidental impervious areas (see below).

☒ Each area drains directly offsite or to the public storm drain system.

☒ Soils are undisturbed native topsoil, or disturbed soils that have been amended and aerated to promote water retention characteristics equivalent to undisturbed native topsoil.

☒ Vegetation is native and/or non-native/non-invasive drought tolerant species that do not require regular application of fertilizers and pesticides.

<u>Incidental Impervious Areas (if applicable; see above)</u>

Minor impervious areas may be permitted within the DMA if they satisfy the following criteria:

☐ They are not hydraulically connected to other impervious areas (unless it is a storm water conveyance system such as a brow ditch).

☐ They comprise less than 5% of the total DMA. Calculate the % incidental impervious area in the table above (c= b/a). DMAs are <u>not</u> self-mitigating if this area is 5% or greater.

7.0 General Requirements

- Submit this cover page and all required Sub-attachments for all structural BMPs proposed for the project.
- See the BMPDM sections and appendices listed under "BMPDM Design Resources" in the table below for additional explanation of design requirements. Constructed features must fully satisfy the requirements described in these resources, and any other guidance identified by the County.
- PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management. Completion of SWQMP Attachment 8 is also required for these BMPs.
- DMA Exhibits and Construction Plans: DMAs, features, and BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.
- Structural BMP Certification. All structural BMPs documented this attachment and in Attachment 8 must be certified by a registered engineer in Sub-attachment 7.1.
- Structural BMP Verification. Structural BMP installation must be verified by the County at the completion of construction. Applicants must complete an Installation Verification Form (Attachment 10).

Sub-attachments (check all that are completed)	**Requirement**	**BMPDM Design Resources**
☒ **7.1: Preparer's Certification**	Required	• N/A
☒ **7.2: Structural BMP Strategy**	Required	• BMPDM Sections 5.1., 5.3, 5.4, and Chapter 6 • BMPDM Appendix E (pages E-78 through E-210)
☒ **7.3: Structural BMP Checklist(s)**	Required	
☒ **7.4: Stormwater Pollutant Control Worksheet Calculations**	Required	• BMPDM Appendix B
☐ **7.5: Identification and Narrative of Receiving Water and Pollutants of Concern**	Required if flow-thru BMPs are proposed	• N/A

7.1 Engineer of Work Certification for Structural BMPs

Project Name Passerelle Tentative Map Parcel 1

Permit Application Number

CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of structural 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 County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management. I have read and understand that the County of San Diego 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 County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of structural storm water BMPs for this project, of my responsibilities for their design.

☒ In addition to the structural pollutant control BMPs described in this attachment, this certification applies to the Structural Hydromodification Management BMPs described in Attachment 8 (check if applicable).

William O'Gorman RCE 88286, Exp 3/31/2024

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

William O'Gorman

Print Name

REC Consultants, Inc.

Company

8-22-23

Date

Engineer's Seal:

7.2 Structural BMP Strategy

7.2.1 Narrative Strategy (Continue description on subsequent pages as necessary)

Describe the general strategy for structural BMP implementation at the project site. For pollutant control BMPs, your description must address the key points outlined in Section 5.1 of the BMP Design Manual, and the type of BMPs selected. For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

In the existing condition, the site a previously graded undeveloped pad. In the proposed condition, thirty five single family residences with a drive aisle will be constructed.

DMA A consists of all onsite developed areas. Runoff will flow to an underground storage tank (BMP-B) for hydromodification flow control before discharge to a Modular Wetland System proprietary biofiltration BMP (BF-3) for pollutant control.

DMA B is a self-mitigating DMA that consist of the existing landscaped slope along the east, south, and west of the site to remain.

Runoff from DMA A and DMA B will drain to an existing curb inlet on Friesian Way (Point of Comparison 1).

7.2.2 Structural BMP Summary Table (Complete for all proposed structural BMPs)

- List and provide the information requested below for all pollutant control and hydromodification management BMPs proposed for the project.
- For each BMP listed, complete the Structural BMP Checklist on the next page. Copy the Checklist as many times as needed.

BMP ID #	DMA #	DMA Area (ft²)	Structural BMP Type							Permit # and Sheet #
			Harvest and Use	Infiltration	Unlined Biofiltration	Lined Biofiltration	Flow-thru treatment	Hydromodification Management [1]	Other	
A	A	119,764	☐	☐	☐	☒	☐	☐	☐	Tentative Map, Sheet 4
B	A	119,764	☐	☐	☐	☐	☐	☒	☐	Tentative Map, Sheet 4
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	

Copy and Paste table here for additional BMPs

[1] Hydromodification Management BMPs must be accompanied by BMPs that provide pollutant control.

7.3 Structural BMP Checklist (Complete once for each proposed structural BMP)

Structural BMP ID # BMP-A	**Permit # and Sheet #** Tentative Map, Sheet 4

BMP Type

Infiltration

☐ Infiltration basin (INF-1)
☐ Bioretention (INF-2)
☐ Permeable pavement (INF-3)

Unlined Biofiltration

☐ Biofiltration with partial retention (PR-1)

Lined Biofiltration

☐ Biofiltration (BF-1)
☐ Nutrient Sensitive Media Design (BF-2)
☒ Proprietary Biofiltration (BF-3)

Harvest and Use

☐ Cistern (HU-1)

Flow-thru Treatment (describe below)

☐ With prior lawful approval to meet earlier PDP requirements
☐ Pre-treatment/forebay for an onsite retention or biofiltration BMP[2]
☐ With alternative compliance

Hydromodification Management[3]

☐ Detention pond or vault

☐ **Other** (describe below)

BMP Purpose

☒ Pollutant control only
☐ Hydromodification control only
☐ Combined pollutant control and hydromodification
☐ Pre-treatment/forebay for another BMP
☐ Other (describe below)

BMP Verification (See BMPDM Section 8.3)

Provide name and contact information for the party responsible to sign BMP verification forms	REC Consultants, Inc. 2970 5th Ave, Suite 340 San Diego, CA 92103 (619) 232-9200

BMP Ownership and Maintenance (See BMPDM Section 7.3 and Attachment 11)

BMP Maintenance Category	Cat. 1 ☐	Cat. 2 ☒	Cat. 3 ☐	Cat. 4 ☐
Final owner of BMP	☒ HOA	☐ Property Owner	☐ County	☐ Other (describe):
Maintenance of BMP into perpetuity	☒ HOA	☐ Property Owner	☐ County	☐ Other (describe):

Discussion (As needed; Continue on subsequent pages as necessary)

BMP-A is a Modular Wetland System (MWS-L-8-12)

[2] Indicate which onsite retention or biofiltration BMP the pre-treatment/forebay serves.
[3] Hydromodification Management BMPs must be accompanied by BMPs that provide pollutant control.

Structural BMP ID # BMP-B	**Permit # and Sheet #** Tentative Map, Sheet 4

BMP Type

Infiltration
- ☐ Infiltration basin (INF-1)
- ☐ Bioretention (INF-2)
- ☐ Permeable pavement (INF-3)

Unlined Biofiltration
- ☐ Biofiltration with partial retention (PR-1)

Lined Biofiltration
- ☐ Biofiltration (BF-1)
- ☐ Nutrient Sensitive Media Design (BF-2)
- ☐ Proprietary Biofiltration (BF-3)

Harvest and Use
- ☐ Cistern (HU-1)

Flow-thru Treatment (describe below)
- ☐ With prior lawful approval to meet earlier PDP requirements
- ☐ Pre-treatment/forebay for an onsite retention or biofiltration BMP[2]
- ☐ With alternative compliance

Hydromodification Management[3]
- ☒ Detention pond or vault
- ☐ **Other** (describe below)

BMP Purpose
- ☐ Pollutant control only
- ☒ Hydromodification control only
- ☐ Combined pollutant control and hydromodification
- ☐ Pre-treatment/forebay for another BMP
- ☐ Other (describe below)

BMP Verification (See BMPDM Section 8.3)

Provide name and contact information for the party responsible to sign BMP verification forms	REC Consultants, Inc. 2970 5th Ave, Suite 340 San Diego, CA 92103 (619) 232-9200

BMP Ownership and Maintenance (See BMPDM Section 7.3 and Attachment 11)

BMP Maintenance Category	Cat. 1 ☐	Cat. 2 ☒	Cat. 3 ☐	Cat. 4 ☐
Final owner of BMP	☐ HOA	☐ Property Owner	☒ County	☐ Other (describe):
Maintenance of BMP into perpetuity	☐ HOA	☐ Property Owner	☒ County	☐ Other (describe):

Discussion (As needed; Continue on subsequent pages as necessary)
BMP-B is an underground stormtech MC-4500 Chamber.

[2] Indicate which onsite retention or biofiltration BMP the pre-treatment/forebay serves.
[3] Hydromodification Management BMPs must be accompanied by BMPs that provide pollutant control.

7.4 Storm Water Pollutant Control Worksheet Calculations

- Use this page as a cover sheet for the submittal of any required worksheets below.
- Complete the checklist to identify which BMPDM Appendix B (Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods) worksheets are included with this attachment.
- See BMPDM Appendix B for an explanation of the applicability of individual worksheets and detailed guidance on their completion.

Worksheet	Requirement
☒ Worksheet B.1 Calculation of Design Capture Volume (DCV)	Required
☒ Worksheet B.2 Retention Requirements	Required
☒ Worksheet B.3 BMP Performance	Required
☐ Worksheet B.4 Major Maintenance Intervals for Reduced-sized BMPs	If applicable
☐ Other worksheets	As required

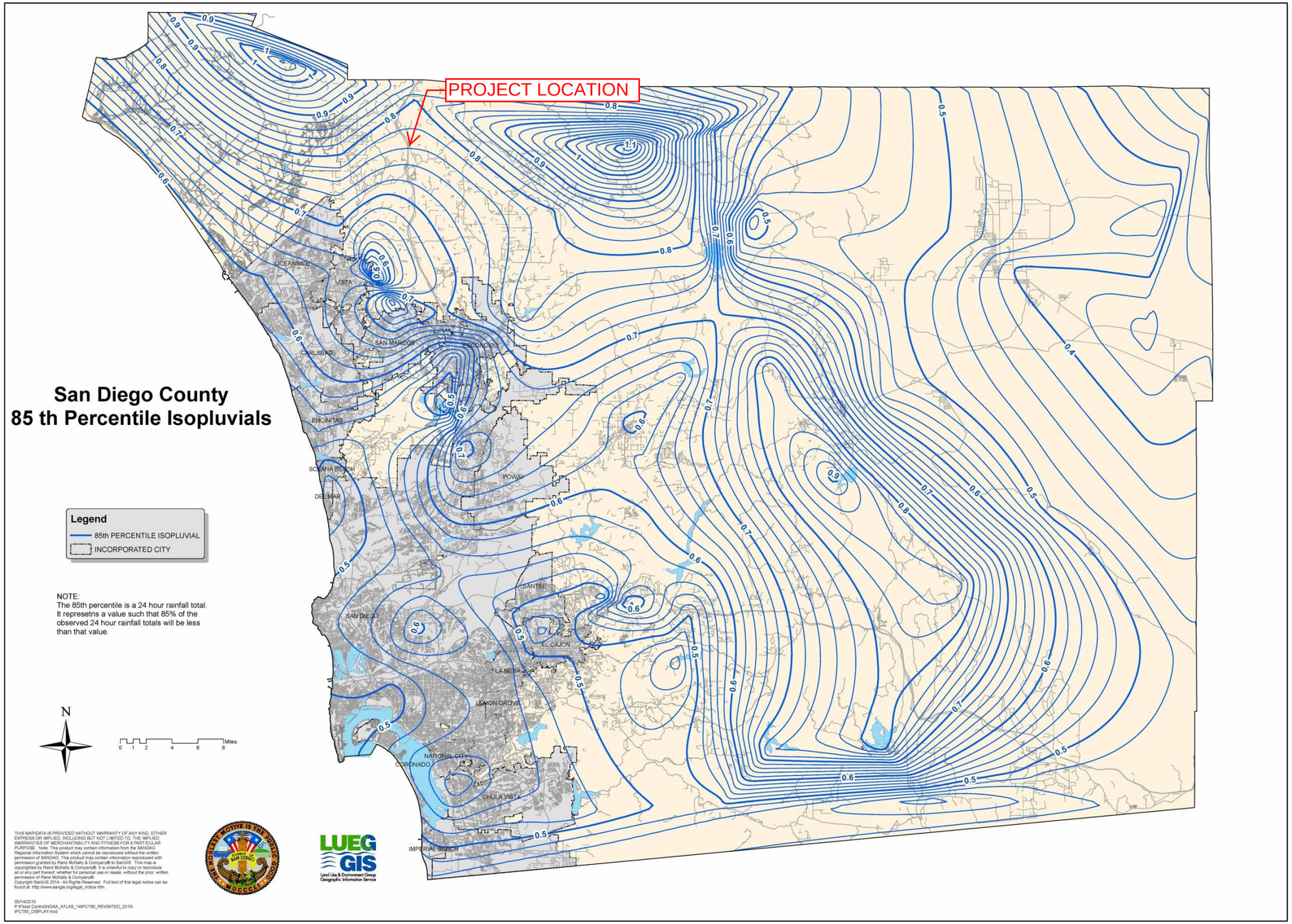


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

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

Category	#	Description	*i*	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA A	unitless
	2	85th Percentile 24-hr Storm Depth	0.76	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	91,623	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)	28,141	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?		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	119,764	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.74	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	unitless
	25	Initial Weighted Runoff Factor	0.74	unitless
	26	Initial Design Capture Volume	5,613	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	sq-ft
	28	Total Pervious Dispersion Area	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.74	unitless
	32	Design Capture Volume After Dispersion Techniques	5,613	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.74	unitless
	36	Final Effective Tributary Area	88,625	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	5,613	cubic-feet

No Warning Messages

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

Category	#	Description	*i*	Units
Basic Analysis	1	Drainage Basin ID or Name	DMA A	unitless
	2	85th Percentile Rainfall Depth	0.76	inches
	3	Predominant NRCS Soil Type Within BMP Location	C	unitless
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Unrestricted	unitless
	5	Nature of Restriction	n/a	unitless
	6	Do Minimum Retention Requirements Apply to this Project?	Yes	yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No	yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	No	yes/no
	9	Design Infiltration Rate Recommended by Geotechnical Engineer		in/hr
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.100	in/hr
	11	Percent of Average Annual Runoff that Must be Retained within DMA	16.3%	percentage
	12	Fraction of DCV Requiring Retention	0.10	ratio
	13	Required Retention Volume	561	cubic-feet

No Warning Messages

Bio Clean

A Forterra Company

Modular Wetlands® Linear

A Stormwater Biofiltration Solution

SPECIFICATIONS

FLOW-BASED DESIGNS

The Modular Wetlands® System Linear can be used in stand-alone applications to meet treatment flow requirements, and since it 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.

MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4′ x 4′	23	0.052
MWS-L-4-6	4′ x 6′	32	0.073
MWS-L-4-8	4′ x 8′	50	0.115
MWS-L-4-13	4′ x 13′	63	0.144
MWS-L-4-15	4′ x 15′	76	0.175
MWS-L-4-17	4′ x 17′	90	0.206
MWS-L-4-19	4′ x 19′	103	0.237
MWS-L-4-21	4′ x 21′	117	0.268
MWS-L-6-8	7′ x 9′	64	0.147
MWS-L-8-8	8′ x 8′	100	0.230
MWS-L-8-12	8′ x 12′	151	0.346
MWS-L-8-16	8′ x 16′	201	0.462
MWS-L-8-20	9′ x 21′	252	0.577
MWS-L-8-24	9′ x 25′	302	0.693
MWS-L-10-20	10' x 20'	302	0.693

CONSIDERATIONS ABOUT PERCENTAGE OF RUNOFF BIO-FILTERED BY MODULAR WETLANDS LOCATED DOWNSTREAM OF UNDERGROUND DETENTION SYSTEM – PARCEL 1.

In this project the proprietary BMP (Modular Wetland) is located downstream of an underground system. From information directly gathered from the SWMM Continuous simulation of Parcel 1, the following volumes can be obtained:

DESCRIPTION	VOLUME (gals 10^6)	VOLUME (acre-ft)	% Volume
Runoff into Underground System (Runoff out of DMA-1-C)	**46.445**	**142.53**	**100%**
Runoff out of Underground System (Runoff into Div-UND)	30.814	94.56	66%
Infiltrated Runoff (Runoff into basin – Runoff exit basin)	15.631 (46.445 – 30.814)	47.97	34%
Low-Flow to MW BMP (diversion volume of low flows)	27.177	83.4	59% (27.177/46.445)
Overflow(diversion volume of high flows) = ***NOT TREATED RUNOFF***	3.637 (30.814 – 27.177)	11.16	***7.8% (11.16/142.53)***

From the total volume entering the underground (100%), 66% leaves the system, meaning that 34% of the volume infiltrates at the bottom of the underground system. Of the remaining 66%, 59% is treated by the modular wetlands and 7.8% by-passes the modular wetlands. Therefore, 92.2% of the runoff is treated (either infiltrated or treated by the MW) and only 7.8% is by-passed, satisfying the 92% treatment requirement.

The Continuous simulation model shows a diversion structure: Flows 0.190 cfs or lower are 100% treated, while flows higher than 0.190 cfs are partially treated and partially by-passed (for example, for a runoff of 0.937 cfs, 0.245 cfs goes to treatment while 0.692 cfs by-passes).

The diversion structure consist of a 3" orifice at elevation 0.00, (a plate with a 3" orifice to separate low flows, to be conveyed by a downstream 6" PVC pipe draining into the MW), and an 18" pipe at invert elevation 0.75 ft. The discharge vs elevation (attached after this page) allows the inclusion of the diversion table in the HMP model. The diversion table is only for accountability purposes of treatment, as it plays no role in hydromodification (all runoff reach the same POC as runoff is only partitioned to account for treated portion and by-passed portion).

Finally, the MW must have a design capacity of about 0.293 cfs (maximum diverted low flow per the continuous simulation model on 1/16/1978). Therefore, a MW with treatment capacity of 0.3 cfs will be specified.

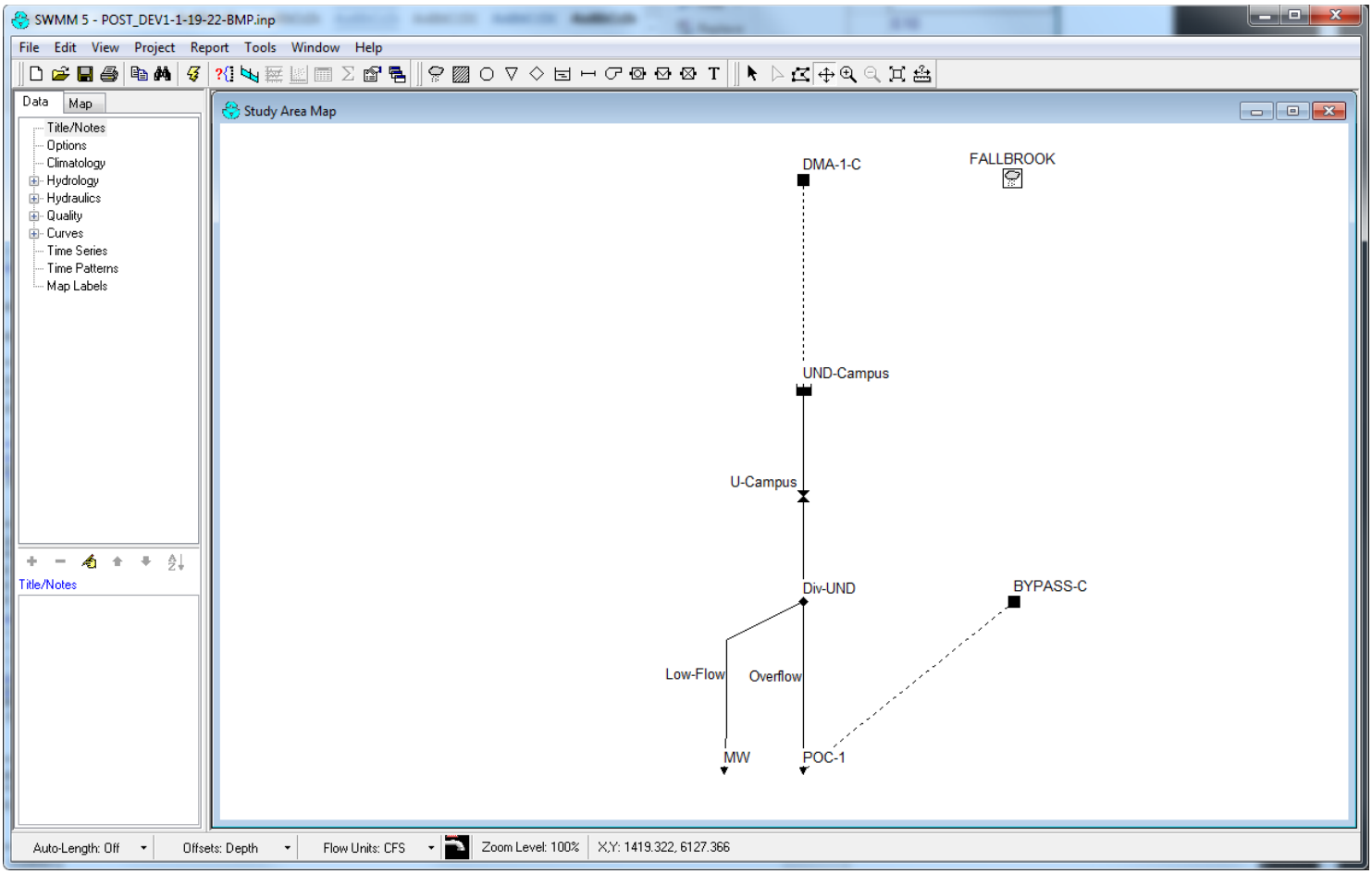
Diversion Structure: 2 pipes - PARCEL 1

Discharge vs Elevation Table

Low orifice	3.000	"	Lower slot			Lower Weir	
Number of orif:	1		# of slots:	0		Number of weirs:	0
Cg-low:	0.61		Invert:	2.25	ft	Invert:	3.75
			B	0.000	ft	B:	0.000
Middle orifice	18.000	"	h_{slot}	0.000	ft		
Number of orif:	1						
Cg-middle:	0.61		Upper slot			Emergency weir	
invert elev:	0.750	ft	# of slots:	0		Invert:	5.500
			Invert:	2.500	ft	W:	0.000 ft
			B:	0.000	ft		
*Note: h = head above the invert of the lowest surface discharge opening.			h_{slot}	0.000	ft		

h* (ft)	H/D-low -	H/D-mid -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qslot-low (cfs)	Qslot-upp (cfs)	Qweir (cfs)	Qemerg (cfs)	Qtot (cfs)
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	0.000
0.083	0.333	0.000	0.000	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
0.167	0.667	0.000	0.049	0.041	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
0.250	1.000	0.000	0.085	0.081	0.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081
0.333	1.333	0.000	0.110	0.125	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110
0.417	1.667	0.000	0.130	0.165	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.130
0.500	2.000	0.000	0.147	0.195	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147
0.583	2.333	0.000	0.163	0.213	0.163	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.163
0.667	2.667	0.000	0.177	0.219	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.177
0.750	3.000	0.000	0.190	0.221	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.190
0.833	3.333	0.056	0.202	0.230	0.202	0.000	0.030	0.030	0.000	0.000	0.000	0.000	0.232
0.917	3.667	0.111	0.214	0.270	0.214	0.000	0.116	0.116	0.000	0.000	0.000	0.000	0.330
1.000	4.000	0.167	0.225	0.369	0.225	0.000	0.256	0.256	0.000	0.000	0.000	0.000	0.481
1.083	4.333	0.222	0.235	0.568	0.235	0.000	0.449	0.449	0.000	0.000	0.000	0.000	0.684
1.167	4.667	0.278	0.245	0.919	0.245	0.000	0.691	0.691	0.000	0.000	0.000	0.000	0.937
1.250	5.000	0.333	0.255	1.488	0.255	0.000	0.982	0.982	0.000	0.000	0.000	0.000	1.236
1.333	5.333	0.389	0.264	2.351	0.264	0.000	1.317	1.317	0.000	0.000	0.000	0.000	1.581
1.417	5.667	0.444	0.273	2.731	0.273	0.000	1.695	1.695	0.000	0.000	0.000	0.000	1.968
1.500	6.000	0.500	0.282	2.818	0.282	0.000	2.112	2.112	0.000	0.000	0.000	0.000	2.394
1.583	6.333	0.556	0.290	2.902	0.290	2.497	2.567	2.567	0.000	0.000	0.000	0.000	2.857
1.667	6.667	0.611	0.298	2.984	0.298	3.532	3.055	3.055	0.000	0.000	0.000	0.000	3.353
1.750	7.000	0.667	0.306	3.063	0.306	4.325	3.574	3.574	0.000	0.000	0.000	0.000	3.880
1.833	7.333	0.722	0.314	3.141	0.314	4.994	4.121	4.121	0.000	0.000	0.000	0.000	4.435
1.917	7.667	0.778	0.322	3.216	0.322	5.584	4.692	4.692	0.000	0.000	0.000	0.000	5.014
2.000	8.000	0.833	0.329	3.290	0.329	6.117	5.285	5.285	0.000	0.000	0.000	0.000	5.614
2.083	8.333	0.889	0.336	3.363	0.336	6.607	5.895	5.895	0.000	0.000	0.000	0.000	6.232
2.167	8.667	0.944	0.343	3.433	0.343	7.063	6.521	6.521	0.000	0.000	0.000	0.000	6.864
2.250	9.000	1.000	0.350	3.503	0.350	7.492	7.158	7.158	0.000	0.000	0.000	0.000	7.508
2.333	9.333	1.056	0.357	3.571	0.357	7.897	7.803	7.803	0.000	0.000	0.000	0.000	8.160
2.417	9.667	1.111	0.364	3.638	0.364	8.282	8.453	8.282	0.000	0.000	0.000	0.000	8.646
2.500	10.000	1.167	0.370	3.703	0.370	8.651	9.105	8.651	0.000	0.000	0.000	0.000	9.021
2.583	10.333	1.222	0.377	3.768	0.377	9.004	9.755	9.004	0.000	0.000	0.000	0.000	9.381
2.667	10.667	1.278	0.383	3.831	0.383	9.344	10.401	9.344	0.000	0.000	0.000	0.000	9.727
2.750	11.000	1.333	0.389	3.893	0.389	9.672	11.040	9.672	0.000	0.000	0.000	0.000	10.061
2.833	11.333	1.389	0.395	3.955	0.395	9.989	11.669	9.989	0.000	0.000	0.000	0.000	10.384
2.917	11.667	1.444	0.401	4.015	0.401	10.296	12.285	10.296	0.000	0.000	0.000	0.000	10.698
3.000	12.000	1.500	0.407	4.074	0.407	10.595	12.885	10.595	0.000	0.000	0.000	0.000	11.002
3.083	12.333	1.556	0.413	4.133	0.413	10.885	13.467	10.885	0.000	0.000	0.000	0.000	11.298
3.167	12.667	1.611	0.419	4.191	0.419	11.168	14.029	11.168	0.000	0.000	0.000	0.000	11.587
3.250	13.000	1.667	0.425	4.248	0.425	11.444	14.568	11.444	0.000	0.000	0.000	0.000	11.868
3.333	13.333	1.722	0.430	4.304	0.430	11.713	15.083	11.713	0.000	0.000	0.000	0.000	12.143
3.417	13.667	1.778	0.436	4.360	0.436	11.976	15.571	11.976	0.000	0.000	0.000	0.000	12.412
3.500	14.000	1.833	0.441	4.414	0.441	12.234	16.032	12.234	0.000	0.000	0.000	0.000	12.675

POST_DEV-BMP




```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------


**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************

***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ JUL-24-1951 00:00:00
Ending Date .............. MAY-24-2008 23:00:00
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
```

```
WARNING 04: minimum elevation drop used for Conduit Low-Flow

WARNING 04: minimum elevation drop used for Conduit Overflow

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......       213.734       871.080
Evaporation Loss .........        19.541        79.640
Infiltration Loss ........        52.432       213.688
Surface Runoff ...........       144.444       588.687
Final Surface Storage ....         0.000         0.000
Continuity Error (%) .....        -1.255


**************************        Volume         Volume
Flow Routing Continuity        acre-feet      10^6 gal
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......       144.444        47.069
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........        96.474        31.437
Internal Outflow .........         0.000         0.000
Storage Losses ...........        47.933        15.620
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.004         0.001
Continuity Error (%) .....         0.023


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


************************
Routing Time Step Summary
************************
Minimum Time Step           :    60.00 sec
Average Time Step           :    60.00 sec
Maximum Time Step           :    60.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00


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

-----------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total       Total     Peak  Runoff
                        Precip      Runon       Evap      Infil     Runoff      Runoff   Runoff   Coeff
Subcatchment                in         in         in         in         in    10^6 gal      CFS
-----------------------------------------------------------------------------------------------------------
DMA-1-C                 871.08       0.00      84.84     175.26     622.12       46.44     3.81   0.714
BYPASS-C                871.08       0.00       6.34     755.48     117.33        0.62     0.26   0.135


******************
Node Depth Summary
******************

-------------------------------------------------------------------
                            Average  Maximum  Maximum  Time of Max
                              Depth    Depth      HGL   Occurrence
Node                 Type      Feet     Feet     Feet  days hr:min
-------------------------------------------------------------------
```

POC-1	OUTFALL	0.00	0.00	0.00	0	00:00
MW	OUTFALL	0.00	0.00	0.00	0	00:00
Div-UND	DIVIDER	0.00	0.00	0.00	0	00:00
UND-Campus	STORAGE	0.05	5.03	5.03	9673	21:03

****
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
POC-1	OUTFALL	0.26	3.01	9673	21:00	0.621	4.258
MW	OUTFALL	0.00	0.29	9673	21:03	0.000	27.177
Div-UND	DIVIDER	0.00	3.07	9673	21:03	0.000	30.814
UND-Campus	STORAGE	3.81	3.81	9673	21:00	46.445	46.445

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
Div-UND	DIVIDER	498239.02	0.000	0.000
UND-Campus	STORAGE	498239.02	5.030	1.720

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min		Maximum Outflow CFS
UND-Campus	0.112	1	34	14.547	83	9673	21:03	3.07

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal
POC-1	0.16	0.20	3.01	4.258
MW	3.45	0.06	0.29	27.177
System	1.80	0.26	3.30	31.435

****

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
Low-Flow	DUMMY	0.29	9673	21:03			
Overflow	DUMMY	2.77	9673	21:03			
U-Campus	DUMMY	3.07	9673	21:03			

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
Low-Flow	0.01	0.01	0.01	498239.02	0.01
Overflow	0.01	0.01	0.01	498239.02	0.01

Analysis begun on: Tue Aug 22 15:11:07 2023
Analysis ended on: Tue Aug 22 15:11:55 2023
Total elapsed time: 00:00:48

POST_DEV_BMP

```
[TITLE]

[OPTIONS]
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         KINWAVE
START_DATE           07/24/1951
START_TIME           00:00:00
REPORT_START_DATE    07/24/1951
REPORT_START_TIME    00:00:00
END_DATE             05/24/2008
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             04:00:00
ROUTING_STEP         0:01:00
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0

[EVAPORATION]
;;Type       Parameters
;;---------- ----------
MONTHLY      0.06   0.08   0.11   0.16   0.18   0.21   0.21   0.20   0.16   0.12   0.08   0.06
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
FALLBROOK        INTENSITY 1:00   1.0    TIMESERIES FALLBROOK

[SUBCATCHMENTS]
;;                                          Total    Pcnt.             Pcnt.    Curb     Snow
;;Name           Raingage         Outlet     Area     Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- ---------- -------- -------- -------- -------- -------- --------
DMA-1-C          FALLBROOK        UND-Campus 2.7494   76.50    614      2.0      0
BYPASS-C         FALLBROOK        POC-1      0.195    0        305      33       0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
DMA-1-C          0.012      0.05       0.05       0.10       25         OUTLET
BYPASS-C         0.012      0.05       0.05       0.10       25         OUTLET

[INFILTRATION]
;;Subcatchment   Suction    HydCon     IMDmax
;;-------------- ---------- ---------- ----------
DMA-1-C          6          0.075      0.31
BYPASS-C         6          0.10       0.31

[LID_CONTROLS]
;;               Type/Layer Parameters
;;-------------- ---------- ----------
LID-1            BC
LID-1            SURFACE    10.2       0.05       0          0          5
LID-1            SOIL       18         0.4        0.2        0.1        5          5          1.5
LID-1            STORAGE    21         0.67       0          0
LID-1            DRAIN      0.3642     0.5        3          6

[LID_USAGE]
;;Subcatchment   LID Process      Number  Area       Width      InitSatur  FromImprv  ToPerv     Report File
;;-------------- ---------------- ------- ---------- ---------- ---------- ---------- ---------- -----------

[OUTFALLS]
;;               Invert     Outfall    Stage/Table      Tide
;;Name           Elev.      Type       Time Series      Gate
```

POST_DEV_BMP

```
;;-------------- ---------- ---------- ---------------- ----
POC-1            0          FREE                        NO
MW               0          FREE                        NO

[DIVIDERS]
;;               Invert     Diverted         Divider
;;Name           Elev.      Link             Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
Div-UND          0          Low-Flow         TABULAR    Und-Div         0          0          0          0

[STORAGE]
;;               Invert   Max.     Init.    Storage    Curve                    Ponded   Evap.
;;Name           Elev.    Depth    Depth    Curve      Params                   Area     Frac.    Infiltration
Parameters
;;-------------- -------- -------- -------- ---------- -------- -------- -------- -------- -----------------
------
UND-Campus       0        6.75     0        TABULAR    UND-Campus               1672     0        6        0.1875
0.31

[CONDUITS]
;;               Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Max.
;;Name           Node             Node             Length     N          Offset     Offset     Flow       Flow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
Low-Flow         Div-UND          MW               100        0.01       0          0          0          0
Overflow         Div-UND          POC-1            100        0.01       0          0          0          0

[OUTLETS]
;;               Inlet            Outlet           Outflow    Outlet          Qcoeff/                    Flap
;;Name           Node             Node             Height     Type            QTable           Qexpon    Gate
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- ----
U-Campus         UND-Campus       Div-UND          0          TABULAR/HEAD    U-Out-Campus               NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;-------------- ------------ ---------------- ---------- ---------- ---------- ----------
Low-Flow         DUMMY        0                0          0          0          1
Overflow         DUMMY        0                0          0          0          1

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate
;;-------------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
Und-Div          Diversion  0          0
Und-Div                     0.190      0.190
Und-Div                     0.232      0.202
Und-Div                     0.330      0.214
Und-Div                     0.481      0.225
Und-Div                     0.684      0.235
Und-Div                     0.937      0.245
Und-Div                     1.236      0.255
Und-Div                     1.581      0.264
Und-Div                     1.968      0.273
Und-Div                     2.394      0.282
Und-Div                     2.857      0.290
Und-Div                     3.353      0.298
Und-Div                     3.880      0.306
Und-Div                     4.435      0.314
Und-Div                     5.014      0.322
Und-Div                     5.614      0.329
Und-Div                     6.232      0.336
Und-Div                     6.864      0.343
Und-Div                     7.508      0.350
Und-Div                     8.160      0.357
Und-Div                     8.646      0.364
Und-Div                     9.021      0.370
Und-Div                     9.381      0.377
Und-Div                     9.727      0.383
Und-Div                     10.061     0.389
Und-Div                     10.384     0.395
Und-Div                     10.698     0.401
Und-Div                     11.002     0.407
Und-Div                     11.298     0.413
Und-Div                     11.587     0.419
Und-Div                     11.868     0.425
```

POST_DEV_BMP

Und-Div		12.143	0.430
Und-Div		12.412	0.436
Und-Div		12.675	0.441
U-Out-Campus	Rating	0	0.000
U-Out-Campus		0.50	0.000
U-Out-Campus		0.58	0.008
U-Out-Campus		0.67	0.028
U-Out-Campus		0.75	0.039
U-Out-Campus		0.83	0.047
U-Out-Campus		0.92	0.055
U-Out-Campus		1.00	0.061
U-Out-Campus		1.08	0.067
U-Out-Campus		1.17	0.072
U-Out-Campus		1.25	0.077
U-Out-Campus		1.33	0.082
U-Out-Campus		1.42	0.086
U-Out-Campus		1.50	0.090
U-Out-Campus		1.58	0.094
U-Out-Campus		1.67	0.098
U-Out-Campus		1.75	0.102
U-Out-Campus		1.83	0.105
U-Out-Campus		1.92	0.109
U-Out-Campus		2.00	0.112
U-Out-Campus		2.08	0.115
U-Out-Campus		2.17	0.118
U-Out-Campus		2.25	0.121
U-Out-Campus		2.33	0.124
U-Out-Campus		2.42	0.127
U-Out-Campus		2.50	0.130
U-Out-Campus		2.58	0.133
U-Out-Campus		2.67	0.136
U-Out-Campus		2.75	0.138
U-Out-Campus		2.83	0.243
U-Out-Campus		2.92	0.434
U-Out-Campus		3.00	0.679
U-Out-Campus		3.08	0.969
U-Out-Campus		3.17	1.173
U-Out-Campus		3.25	1.322
U-Out-Campus		3.33	1.454
U-Out-Campus		3.42	1.575
U-Out-Campus		3.50	1.686
U-Out-Campus		3.58	1.790
U-Out-Campus		3.67	1.889
U-Out-Campus		3.75	1.982
U-Out-Campus		3.83	2.070
U-Out-Campus		3.92	2.155
U-Out-Campus		4.00	2.237
U-Out-Campus		4.08	2.315
U-Out-Campus		4.17	2.391
U-Out-Campus		4.25	2.464
U-Out-Campus		4.33	2.536
U-Out-Campus		4.42	2.605
U-Out-Campus		4.50	2.672
U-Out-Campus		4.58	2.738
U-Out-Campus		4.67	2.802
U-Out-Campus		4.75	2.865
U-Out-Campus		4.83	2.926
U-Out-Campus		4.92	2.986
U-Out-Campus		5.00	3.045
U-Out-Campus		5.08	3.103
U-Out-Campus		5.17	3.159
U-Out-Campus		5.25	3.215
U-Out-Campus		5.33	3.270
U-Out-Campus		5.42	3.323
U-Out-Campus		5.50	3.376
U-Out-Campus		5.58	3.428
U-Out-Campus		5.67	3.480
U-Out-Campus		5.75	3.530
U-Out-Campus		5.83	3.580
U-Out-Campus		5.92	3.629
U-Out-Campus		6.00	3.677
U-Out-Campus		6.08	3.986
U-Out-Campus		6.17	4.511
U-Out-Campus		6.25	5.175
U-Out-Campus		6.33	5.953
U-Out-Campus		6.42	6.829

U-Out-Campus		6.50	7.792
U-Out-Campus		6.58	8.834
U-Out-Campus		6.67	9.950
U-Out-Campus		6.75	11.135
UND-Campus	Storage	0.000	1672.0
UND-Campus		0.500	1672.0
UND-Campus		0.583	1672.0
UND-Campus		0.667	1672.0
UND-Campus		0.750	1672.0
UND-Campus		0.7501	3466.7
UND-Campus		0.833	3484.8
UND-Campus		0.917	3476.3
UND-Campus		1.000	3457.5
UND-Campus		1.083	3463.2
UND-Campus		1.167	3442.3
UND-Campus		1.250	3448.7
UND-Campus		1.333	3428.2
UND-Campus		1.417	3432.4
UND-Campus		1.500	3411.0
UND-Campus		1.583	3414.2
UND-Campus		1.667	3391.7
UND-Campus		1.750	3394.1
UND-Campus		1.833	3370.8
UND-Campus		1.917	3369.4
UND-Campus		2.000	3350.0
UND-Campus		2.083	3345.0
UND-Campus		2.167	3324.6
UND-Campus		2.250	3318.5
UND-Campus		2.333	3295.8
UND-Campus		2.417	3291.0
UND-Campus		2.500	3266.0
UND-Campus		2.583	3260.0
UND-Campus		2.667	3231.9
UND-Campus		2.750	3227.3
UND-Campus		2.833	3197.5
UND-Campus		2.917	3190.8
UND-Campus		3.000	3159.9
UND-Campus		3.083	3152.1
UND-Campus		3.167	3119.1
UND-Campus		3.250	3109.9
UND-Campus		3.333	3075.3
UND-Campus		3.417	3064.4
UND-Campus		3.500	3028.2
UND-Campus		3.583	3014.1
UND-Campus		3.667	2978.7
UND-Campus		3.750	2961.5
UND-Campus		3.833	2923.8
UND-Campus		3.917	2904.8
UND-Campus		4.000	2864.6
UND-Campus		4.083	2842.8
UND-Campus		4.167	2799.7
UND-Campus		4.250	2774.9
UND-Campus		4.333	2728.3
UND-Campus		4.417	2699.6
UND-Campus		4.500	2649.8
UND-Campus		4.583	2616.5
UND-Campus		4.667	2561.9
UND-Campus		4.750	2522.7
UND-Campus		4.833	2461.4
UND-Campus		4.917	2414.2
UND-Campus		5.000	2341.4
UND-Campus		5.083	2279.8
UND-Campus		5.167	2187.3
UND-Campus		5.250	2091.6
UND-Campus		5.333	1890.5
UND-Campus		5.417	1834.0
UND-Campus		5.500	1806.1
UND-Campus		5.583	1771.6
UND-Campus		5.667	1733.6
UND-Campus		5.750	1672.0
UND-Campus		5.833	1672.0
UND-Campus		5.917	1672.0
UND-Campus		6.000	1672.0
UND-Campus		6.083	1672.0
UND-Campus		6.167	1672.0
UND-Campus		6.250	1672.0

```
UND-Campus                 6.333      1672.0
UND-Campus                 6.417      1672.0
UND-Campus                 6.500      1672.0
UND-Campus                 6.583      1672.0
UND-Campus                 6.667      1672.0
UND-Campus                 6.750      1672.0

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
FALLBROOK        FILE "Fallbrook.txt"

[REPORT]
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 950.000 4925.000 2050.000 6575.000
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
POC-1            1500.000           4600.000
MW               1313.552           4600.849
Div-UND          1500.000           5000.000
UND-Campus       1500.000           5500.000

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Low-Flow         1319.024           4910.023
Low-Flow         1319.024           4700.340

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
DMA-1-C          1500.000           6000.000
BYPASS-C         2000.000           5000.000

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
FALLBROOK        2000.000           6000.000
```

Project: **CAMPUS PARK, PARCEL 1**

Chamber Model -	MC-4500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	96	
Number of End Caps -	8	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	4180	sf Min. Area - 3781 sf min. area

☑ Include Perimeter Stone in Calculations

StormTech MC-4500 Cumulative Storage Volumes

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
81	0.00	0.00	0.00	0.00	139.33	139.33	17610.59	6.75
80	0.00	0.00	0.00	0.00	139.33	139.33	17471.26	6.67
79	0.00	0.00	0.00	0.00	139.33	139.33	17331.93	6.58
78	0.00	0.00	0.00	0.00	139.33	139.33	17192.59	6.50
77	0.00	0.00	0.00	0.00	139.33	139.33	17053.26	6.42
76	0.00	0.00	0.00	0.00	139.33	139.33	16913.93	6.33
75	0.00	0.00	0.00	0.00	139.33	139.33	16774.59	6.25
74	0.00	0.00	0.00	0.00	139.33	139.33	16635.26	6.17
73	0.00	0.00	0.00	0.00	139.33	139.33	16495.93	6.08
72	0.00	0.00	0.00	0.00	139.33	139.33	16356.59	6.00
71	0.00	0.00	0.00	0.00	139.33	139.33	16217.26	5.92
70	0.00	0.00	0.00	0.00	139.33	139.33	16077.93	5.83
69	0.04	0.01	3.93	0.10	137.72	141.76	15938.59	5.75
68	0.12	0.03	11.15	0.27	134.77	146.18	15796.84	5.67
67	0.16	0.05	15.81	0.41	132.84	149.07	15650.65	5.58
66	0.21	0.07	20.04	0.53	131.11	151.67	15501.58	5.50
65	0.27	0.08	25.76	0.66	128.76	155.19	15349.91	5.42
64	0.45	0.11	43.47	0.84	121.61	165.92	15194.72	5.33
63	0.67	0.13	63.87	1.06	113.36	178.29	15028.80	5.25
62	0.80	0.16	76.71	1.29	108.14	186.13	14850.51	5.17
61	0.91	0.19	87.18	1.51	103.86	192.55	14664.39	5.08
60	1.00	0.22	96.28	1.75	100.12	198.15	14471.84	5.00
59	1.09	0.25	104.38	1.98	96.79	203.15	14273.69	4.92
58	1.16	0.28	111.69	2.20	93.77	207.67	14070.54	4.83
57	1.23	0.30	118.46	2.41	90.98	211.86	13862.87	4.75
56	1.30	0.33	124.77	2.62	88.38	215.77	13651.01	4.67
55	1.36	0.35	130.66	2.84	85.94	219.43	13435.24	4.58
54	1.42	0.38	136.20	3.07	83.63	222.89	13215.81	4.50
53	1.47	0.41	141.44	3.27	81.45	226.16	12992.92	4.42
52	1.53	0.44	146.41	3.53	79.36	229.30	12766.76	4.33
51	1.57	0.47	151.15	3.75	77.37	232.27	12537.46	4.25
50	1.62	0.50	155.65	3.96	75.49	235.10	12305.18	4.17
49	1.67	0.52	159.96	4.17	73.68	237.81	12070.08	4.08
48	1.71	0.54	164.07	4.36	71.96	240.39	11832.27	4.00
47	1.75	0.57	168.01	4.53	70.32	242.86	11591.88	3.92
46	1.79	0.59	171.77	4.71	68.74	245.22	11349.02	3.83
45	1.83	0.61	175.41	4.88	67.22	247.51	11103.80	3.75
44	1.86	0.63	178.89	5.06	65.75	249.70	10856.29	3.67
43	1.90	0.64	182.24	5.14	64.38	251.76	10606.59	3.58
42	1.93	0.68	185.46	5.42	62.98	253.86	10354.83	3.50
41	1.96	0.70	188.55	5.60	61.67	255.82	10100.97	3.42
40	2.00	0.72	191.53	5.78	60.41	257.72	9845.15	3.33
39	2.03	0.74	194.40	5.95	59.19	259.54	9587.43	3.25
38	2.05	0.76	197.16	6.12	58.02	261.30	9327.88	3.17
37	2.08	0.79	199.82	6.28	56.89	263.00	9066.58	3.08
36	2.11	0.80	202.38	6.42	55.81	264.61	8803.58	3.00
35	2.13	0.82	204.85	6.56	54.77	266.18	8538.97	2.92
34	2.16	0.84	207.23	6.71	53.76	267.70	8272.79	2.83
33	2.18	0.85	209.52	6.81	52.80	269.13	8005.10	2.75
32	2.21	0.86	211.73	6.88	51.89	270.50	7735.96	2.67
31	2.23	0.89	213.85	7.12	50.95	271.92	7465.47	2.58
30	2.25	0.90	215.89	7.23	50.08	273.21	7193.55	2.50
29	2.27	0.92	217.86	7.34	49.26	274.45	6920.34	2.42
28	2.29	0.92	219.74	7.36	48.49	275.59	6645.89	2.33
27	2.31	0.94	221.55	7.55	47.69	276.79	6370.30	2.25
26	2.33	0.96	223.29	7.65	46.96	277.90	6093.50	2.17
25	2.34	0.97	224.96	7.75	46.25	278.96	5815.60	2.08
24	2.36	0.98	226.55	7.85	45.57	279.97	5536.65	2.00
23	2.38	0.97	228.08	7.77	45.00	280.84	5256.67	1.92
22	2.39	1.00	229.53	8.03	44.31	281.87	4975.83	1.83
21	2.41	1.01	230.92	8.09	43.73	282.74	4693.96	1.75
20	2.42	1.02	232.25	8.16	43.17	283.58	4411.22	1.67
19	2.43	1.03	233.51	8.24	42.63	284.38	4127.64	1.58
18	2.44	1.04	234.70	8.31	42.13	285.14	3843.26	1.50
17	2.46	1.05	235.84	8.37	41.65	285.86	3558.12	1.42
16	2.47	1.05	236.91	8.43	41.20	286.54	3272.26	1.33
15	2.48	1.05	237.92	8.40	40.81	287.12	2985.72	1.25
14	2.49	1.06	238.87	8.45	40.40	287.73	2698.60	1.17
13	2.50	1.08	239.78	8.60	39.98	288.36	2410.87	1.08
12	2.51	1.08	240.62	8.66	39.62	288.91	2122.50	1.00
11	2.51	1.09	241.41	8.70	39.29	289.40	1833.60	0.92
10	2.53	1.11	242.59	8.85	38.76	290.20	1544.20	0.83
9	0.00	0.00	0.00	0.00	139.33	139.33	1254.00	0.75
8	0.00	0.00	0.00	0.00	139.33	139.33	1114.67	0.67
7	0.00	0.00	0.00	0.00	139.33	139.33	975.33	0.58
6	0.00	0.00	0.00	0.00	139.33	139.33	836.00	0.50
5	0.00	0.00	0.00	0.00	139.33	139.33	696.67	0.42
4	0.00	0.00	0.00	0.00	139.33	139.33	557.33	0.33
3	0.00	0.00	0.00	0.00	139.33	139.33	418.00	0.25
2	0.00	0.00	0.00	0.00	139.33	139.33	278.67	0.17
1	0.00	0.00	0.00	0.00	139.33	139.33	139.33	0.08

CUMULATIVE SYSTEM RETENTION (836) IS GREATER THAN REQUIRED RETENTION VOLUME (561)

WASHINGTON STATE DEPARTMENT OF ECOLOGY

July 2017

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

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 MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment

    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment

    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment

    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

4. Ecology approves the MWS - Linear Modular Wetland 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 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 flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
   - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. These use level designations have no expiration date but may be revoked or amended 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 MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. The applicant tested the MWS – Linear Modular Wetland 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 MWS – Linear Modular Wetland 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 manufactured filter treatment device.

   - Typically, Modular Wetland Systems, Inc. designs MWS - Linear 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 MWS - Linear 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 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 MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant:	Modular Wetland Systems, Inc.
Applicant's Address:	*PO. Box 869* *Oceanside, CA 92054*

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 MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland 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 MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:

<u>Laboratory Testing</u>

The MWS-Linear Modular wetland 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. Modular Wetland Systems, Inc. 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. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:
Download at http://www.modularwetlands.com/

Contact Information:

Applicant: Zach Kent
BioClean A Forterra Company.
398 Vi9a El Centro
Oceanside, CA 92058
zach.kent@forterrabp.com

Applicant website: http://www.modularwetlands.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) 407-6444
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)

8.0 General Requirements

- Completion of this attachment is required for all PDPs subject to hydromodification management requirements (see PDP SWQMP Form Table 5). Do not submit this attachment if exempt from Hydromodification Management requirements. Document the PDP exemption in Attachment 9.
- Submit this cover page and all required Sub-attachments for all structural hydromodification management BMPs proposed for the project.
- Constructed features must fully satisfy the requirements described in applicable BMPDM sections and appendices, and any other guidance identified by the County.
- DMA Exhibits and Construction Plans: DMAs, features, and BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.
- Structural BMP Certification. All structural hydromodification management BMPs documented this attachment must be certified by a registered engineer in Attachment 7, Sub-attachment 7.1.
- Structural BMP Verification. BMP installation must be verified by the County at the completion of construction. Applicants must complete an Installation Verification Form (Attachment 10).

Sub-attachments (check all that are completed)
☒ **8.1: Flow Control Facility Design** (required)[1] Submit using ☐ the Sub-attachment 8.1 cover sheet provided, or ☒ as a separate stand-alone document labeled Sub-attachment 8.1.
☒ **8.2: Hydromodification Management Points of Compliance** (required) Complete the table provided in Sub-attachment 8.2.
8.3: Geomorphic Assessment of Receiving Channels 1. Has a geomorphic assessment been performed for the receiving channel(s)? ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold)
☐ Yes (provide the information below): Low flow threshold: ☐ 0.1Q2 ☐ 0.3Q2 ☐ 0.5Q2
Title: Date: Preparer:
Submit using ☐ the Sub-attachment 8.3 cover sheet provided, or ☐ as a separate stand-alone document labeled Sub-attachment 8.3.
8.4: Vector Control Plan (required if BMPs will not drain in less than 96 hours) ☐ Included with this attachment ☒ Not required

[1] Including Structural BMP Drawdown Calculations and Overflow Design Summary. See BMPDM Chapter 6 and Appendix G for additional design guidance.

8.2 Hydromodification Management Points of Compliance

- List and describe all points of compliance (POCs) for flow control for hydromodification management.
- For each POC, provide a POC identification name or number, and a receiving channel identification name or number correlating to the project's HMP Exhibit (see Attachment 2).

POC name or #	Channel name or #	POC Description
1	1	Existing curb inlet on Friesian Way

9.0 General Requirements

- Complete the table below to indicate which compliance pathway was selected in PDP SWQMP Table 6. Include the corresponding sub-attachment with your SWQMP submittal. Other sub-attachments do not need to be included.
- See the BMPDM sections and appendices listed under "BMPDM Design Resources" for additional explanation of design requirements. Constructed features must fully satisfy the requirements described in these resources, and any other guidance identified by the County.
- DMA Exhibits and Construction Plans: CCSYAs and applicable BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.

Sub-attachments	BMPDM Design Resources
☐ **9.1: Documentation of Hydromodification Management Exemption**[1]	Section 1.6
☒ **9.2: Watershed Management Area Analysis (WMAA) Mapping**[1]	Appendix H.1.1.2
☐ **9.3: Resource Protection Ordinance (RPO) Methods**	Appendix H.1.1.1
☐ **9.4: No Net Impact Analysis**	Appendix H.4

[1] The San Diego County Regional comprehensive WMAA mapping data can be found on the Project Clean Water website here: http://www.projectcleanwater.org/download/wmaa_attc_data/

9.2 Watershed Management Area Analysis (WMAA) Mapping (BMPDM Appendix H.1.1.2)

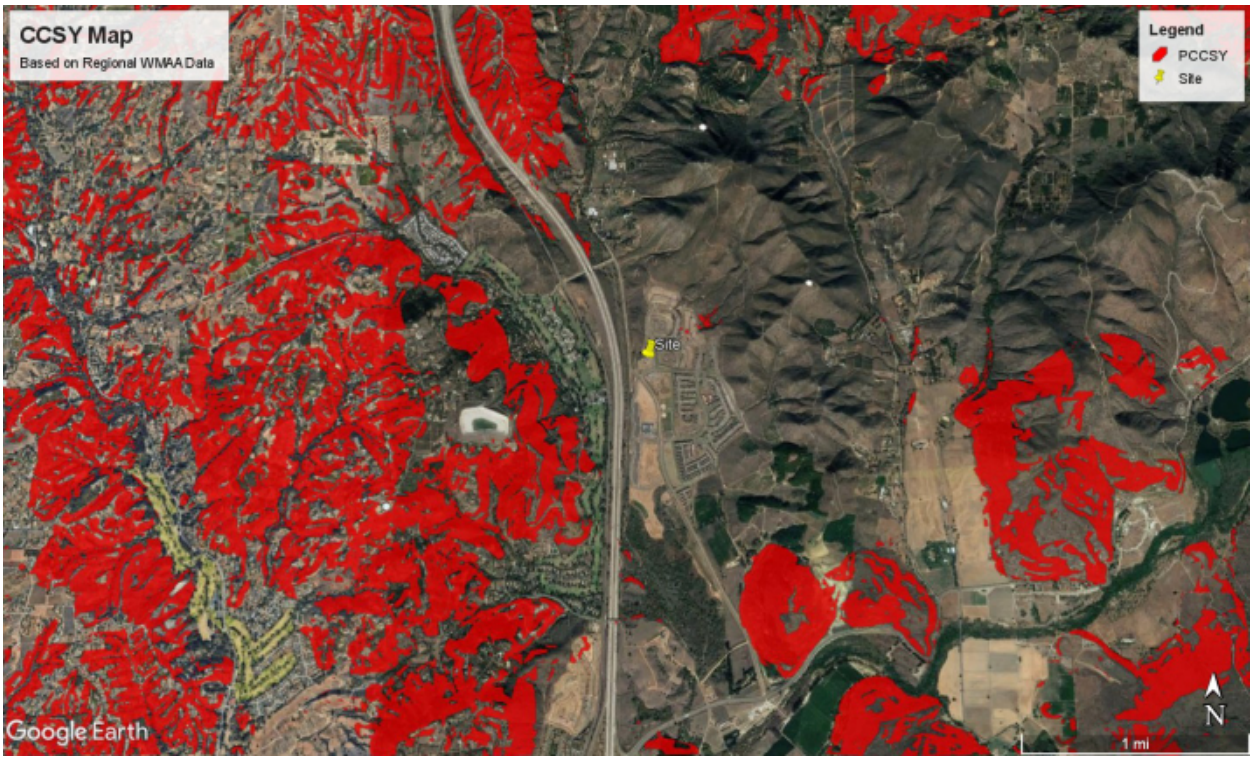
Watershed Management Area Analysis (WMAA) mapping is a simple way to screen projects to determine the presence of onsite or offsite upstream Potential Critical Coarse Sediment Yield Areas (PCCSYAs). The San Diego County Regional WMAA mapping data can be found on the Project Clean Water website here: http://www.projectcleanwater.org/download/wmaa_attc_data/ .[3]

- Based on the WMAA map and the proposed project design, demonstrate below that both of the following conditions apply to the PDP:

  (a) Less than 5% of PCCSYAs will be impacted (built on or obstructed) by the PDP, and

  (b) All upstream offsite PCCYSAs will be bypassed (see BMPDM Appendix H.3).

A. Mapping Results -- At a minimum, show: (1) the project footprint, (2) areas of proposed development, (3) impacted onsite PCCSYAs, (4) offsite tributary areas[4], and (5) bypass of upstream offsite PCCSYAs.



[3] Applicants may refine initial mapping results using options identified in BMPDM Appendix H.1.2.
[4] Tributary areas must be shown to demonstrate that upstream offsite PCCSYAs do not exist. If bypassing these areas, only the bypass should be shown.

B. Explanation -- Provide documentation as needed to demonstrate that (1) impacts to PCCSYAs are below 5%, and (2) upstream offsite PCCYSAs are effectively bypassed. Add pages as necessary.

As shown in the map above, all PCCYSA areas are offsite and out of the surrounding areas, preventing impacts to all PCCYSAs. Additionally, no bypass systems are necessary..

This form must be accepted by the County prior to the release of construction permits or granting of occupancy for applicable portions of a Priority Development Project (PDP). Its purpose is to provide documentation of the final installation of permanent Best Management Practices (BMPs) used to satisfy Structural Performance Standards for the development project. Compliance with these standards reduces the discharge of pollutants and flows from the completed project site. Applicable standards may be satisfied using Structural BMPs (S-BMPs), Significant Site Design BMPs (SSD-BMPs), or both. Applicants are responsible for providing all requested information. Do not leave any fields blank; indicate *N/A* for any requested item that is not applicable.

PART 1 General Project and Applicant Information

Table 1: Project and Applicant Information

A. Project Summary Information	**ID No. IVF-20___-____ To be assigned by DPW-WPP**
Project Name	Passerelle TM Parcel 1
Record ID (e.g. grading/improvement plan number, building permit)	Click here to enter text.
Project Address	(Vacant) Horse Ranch Creek Road, Fallbrook, CA 92028
Assessor's Parcel Number(s) APN(s)	108-120-61 & 63
Project Watershed (complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	903.12 - San Luis Rey HU, Lower San Luis HA, Bonsall HSA
B. Owner Information	
Name	D.R. Horton
Address	10531 4S Commons Dr # 700, San Diego, CA 92127
Email Address	monty@mddhomes.com
Phone Number	(858) 431-9622

****THIS PAGE IS FOR PARTIAL RECORD PLAN VERIFICATIONS ONLY ****

If this is a partial Installation Verification Form submittal, list ALL DMAs and BMPs for the Priority Development Project in **Table 2**. Provide acceptance information where applicable.

Table 2: Information for Partial IVF Submittals

A: DMA and BMP Information

DMA #	Structural and Significant Site Design BMPs	WPP Acceptance Date	IVF ID No. (e.g. 2018-001)

B: DMA and BMP Map

Please attach a map showing (1) all DMAs for the project site, (2) the DMAs and/or lots accepted under previous Verification Forms, and (3) the locations of Structural BMPs and Significant Site Design BMPs previously accepted.

PART 2 DMA and BMP Inventory Information

Use this table to document Structural BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) for the PDP. All DMAs that are not self-mitigating or de minimis must have at least one Structural BMP or Significant Site Design BMP.

- In **Part A**, list all Structural BMPs (including both Pollutant Control and/or Hydromodification as applicable) by DMA.
- Complete **Part B** for all DMAs that contain only Significant Site Design BMPs. SSD-BMPs are Site Design BMPs (SD-BMPs) that are sized and constructed to satisfy Structural Performance Standards for a DMA.
- Documentation of SD-BMPs is not required in this table for any DMA that also contains S-BMPs.
- The information provided for each BMP in the table must match that provided in the Stormwater Quality Management Plan (SWQMP), construction plans, maintenance agreements, and other relevant project documentation.

Table 3: Required Information for Structural BMPs and Significant Site Design BMPs

DMA #	BMP Information			Maintenance Category	Maintenance Agreement or Maintenance Notification Recorded Doc. #	Construction Plan Sheet #	Landscape Plan # & Sheet # (For Vegetated BMPs Only)	FOR DPW-WPP USE ONLY *Reviewer concurs that the BMP(s) may be accepted into inventory (date and initial)*
	Quantity	Description/Type of Structural BMP	BMP ID #(s)					
Part A Structural BMPs (S-BMPs)								
A	1	Modular Wetland System (BF-3)	BMP-A	2				
A	1	Underground Storage Tank	BMP-B	2				
Add rows as needed								
Part B Significant Site Design BMPs (SSD-BMPs)								
				---	---			
		Choose an item.		---	---			
		Choose an item.		---	---			
Add rows as needed								

PART 3 Required Attachments for All BMPs Listed in Table 3

For ALL projects, submit the following to the County inspector (check all that are attached):

☐ Photographs: Labeled photographs illustrating proper construction of each S-BMP or SSD-BMP.

☐ Maintenance Agreements: Copies of all approved and recorded Storm Water Maintenance Agreements (SWMAs) or Maintenance Notifications (MNs) for all S-BMPs.

Note: All BMPs proposed for County ownership will remain the responsibility of the owner listed on **Page 1** until a signed Letter of Acceptance of Completion is received by the DPW Watershed Protection Program.

For Grading and Improvement projects only, ALSO submit:

☐ Construction Plans: An 11" X 17" copy of the most current applicable approved Construction Plan sheets:

- ☐ Grading Plans, AND/OR
- ☐ Improvement Plans, AND/OR
- ☐ Precise Grading Plan(s) (only for residential subdivisions with tract homes), AND/OR
- ☐ Other (Please specify) Click here to enter text.

Note: For each Construction Plan, the sheets submitted must incorporate all of the following:

- ☐ A BMP Table, AND
- ☐ A plan/cross-section of each verified as-built BMP, AND
- ☐ The location of each verified as-built BMP

☐ Landscape Plans: An 11" X 17" copy of the most current applicable Landscape Plan sheets where the BMPs are required to be vegetated, including:

- ☐ The Certification of Completion (Form 407), AND
- ☐ The Certificate of Approval from PDS Landscape Architect

Note: For each Landscape Plan, the sheets submitted must show the location of each verified as-built BMP.

Required only for Verifications for Partial Record Plans

☐ If this is a partial record plan verification, please include the following:

- ☐ A list of previously submitted Verification Forms (**Table 2, A**)
- ☐ A map of DMAs and BMPs (**Table 2, B**)

PART 4 Preparer's Certification

By signing below, I certify that the BMP(s) listed in Table 3 of this Verification Form have been constructed and all are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Note: Structural BMPs (Table 3, Part A) must be certified by a licensed professional engineer.

Please sign and, if applicable, provide your seal below.

[SEAL]

Preparer's Printed Name:

_____

Email: _____

Phone Number: _____

Preparer's Signed Name:

_____

Date: _____

COUNTY - OFFICIAL USE ONLY:

For County Inspectors

County Department: _____

Date verification received from EOW: _____

By signing below, County Inspector concurs that every noted BMP has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

For Building Division Only

Inspection Supervisor Name: _____

Inspector Supervisor's Signature: _____ Date: _____

PDCI & Building, along with the rest of this package, please provide to DPW WPP:

☐ A copy of the final accepted SWQMP and any accepted addendum

For Watershed Protection Program Only

Date Received: _____

WPP Reviewer: _____

WPP Reviewer concurs that the BMPs accepted in **Part 2** above may be entered into inventory.

WPP Reviewer's Signature: _____ Date: _____

11.0 Cover Sheet and General Requirements

- All Structural BMPs must have a plan and mechanism to ensure on-going maintenance. Use the table below to document the types of agreements to be submitted for the PDP and submit them under cover of this sheet.
- See BMPDM Section 7.3 for a description of maintenance categories and responsibilities. Note that since Category 3 and 4 BMPs are County-maintained, they do not require maintenance agreements.

a. Applicability of Maintenance Agreements

Check the boxes below to indicate which types of agreements are included with this attachment.

☒ Maintenance Notification (Category 1 BMPs)

- Exhibit A: Project Site Vicinity; Project Site Map; and a map for each BMP and its Drainage Management Area
- Exhibit B: BMP Maintenance Plan (see below)

☐ Stormwater Maintenance Agreement (Category 2 BMPs)

- Exhibit A: Legal Description of Property
- Exhibit B: BMP Maintenance Plan (see below)
- Exhibit C: Project Site Vicinity Map

Maintenance agreement templates and instructions are provided on the County's website:

www.sandiegocounty.gov/stormwater under the Development Resources tab.

PDP applicants contact County staff to ensure they have the most current forms.

b. Maintenance Plan Requirements

Use this checklist to confirm that each maintenance plan includes the following that as applicable.

☒ Specific **maintenance indicators and actions** for proposed structural BMP(s). These must be based on based on maintenance indicators presented in BMP Design Fact Sheets in Appendix E and enhanced to reflect actual proposed components of the structural BMP(s).

☒ **Access** to inspect and perform maintenance on the structural BMP(s).

☒ Features 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.

RECORDING REQUESTED BY:

WHEN RECORDED MAIL TO:
PASSERELLE, LLC
402 W Broadway #1320,
San Diego, CA 92101
(property owner)

SPACE ABOVE THIS LINE FOR RECORDER'S USE

MAINTENANCE NOTIFICATION AGREEMENT FOR CATEGORY 1 STORMWATER STRUCTURAL BMP's

THIS AGREEMENT is made on the _____ day of _____, 20_____ and replaces and rescinds the previous agreement with document number_____.
PASSERELLE, LLC, the Owner(s) of the hereinafter described real property:
Address (VACANT) HORSE RANCH CREEK ROAD Post Office _____ Zip Code 92028
Assessor Parcel No.(s) 108-120-61 & 62

List, identify, locate (in Exhibit A) and describe the Structural Best Management Practice below:

BMP-A: MODULAR WETLAND SYSTEM

BMP-B: UNDERGROUND STORAGE TANK

Owner(s) of the above property acknowledge the existence of the stormwater Structural Best Management Practice (BMP) on the said property. Perpetual maintenance of the Structural BMP(s) is the requirement of the State NPDES Permit, Order No. R9-2015-0001, Section E.3.e. and the County of San Diego Watershed Protection Ordinance (WPO) Ordinance No. 10385 Section 67.812 through Section 67.814, and County BMP Design Manual (BMP DM) Chapters 7 & 8. In consideration of the requirement to construct and maintain Structural BMP(s), as conditioned by Discretionary Permit, Grading Permit, and/or Building Permit (as may be applicable), I/we hereby covenant and agree that:

1. I/We are the owner(s) of the existing (or to be constructed concurrently) premises located on the above described property.
2. I/We shall take the responsibility for the perpetual maintenance of the Structural BMP(s) as listed above in accordance with the maintenance plan (in Exhibit B) and in compliance with County's self-inspection reporting and verification for as long as I/we have ownership of said property(ies).
3. I/We shall cooperate with and allow the County staff to come onto said property(ies) and perform inspection duties as prescribed by local and state regulators.
4. I/We shall inform future buyer(s) or successors of said property(ies) of the existence and perpetual maintenance requirement responsibilities for Structural BMP(s) as listed above and to ensure that such responsibility shall transfer to the future owner(s).
5. I/We will abide by all of the requirements and standards of Section 67.812 through Section 67.814 of the WPO (or renumbering thereof) as it exists on the date of this Agreement, and which hereby is incorporated herein by reference.

This Agreement shall run with the land. If the subject property is conveyed to any other person, firm, or corporation, the instrument that conveys title or any interest in or to said property, or any portion thereof, shall contain a provision transferring maintenance responsibility for Structural BMP(s) to the successive owner according to the terms of this Agreement. Any violation of this Agreement is grounds for the County to impose penalties upon the property owner as prescribed in County Code of Regulatory Ordinances, Title 1, Division 8, Chapter 1 Administrative Citations §§18.101-18.116.

_____ _____
Owner(s) Signature(s)

_____ _____
Print Owner(s) Name(s) and Title

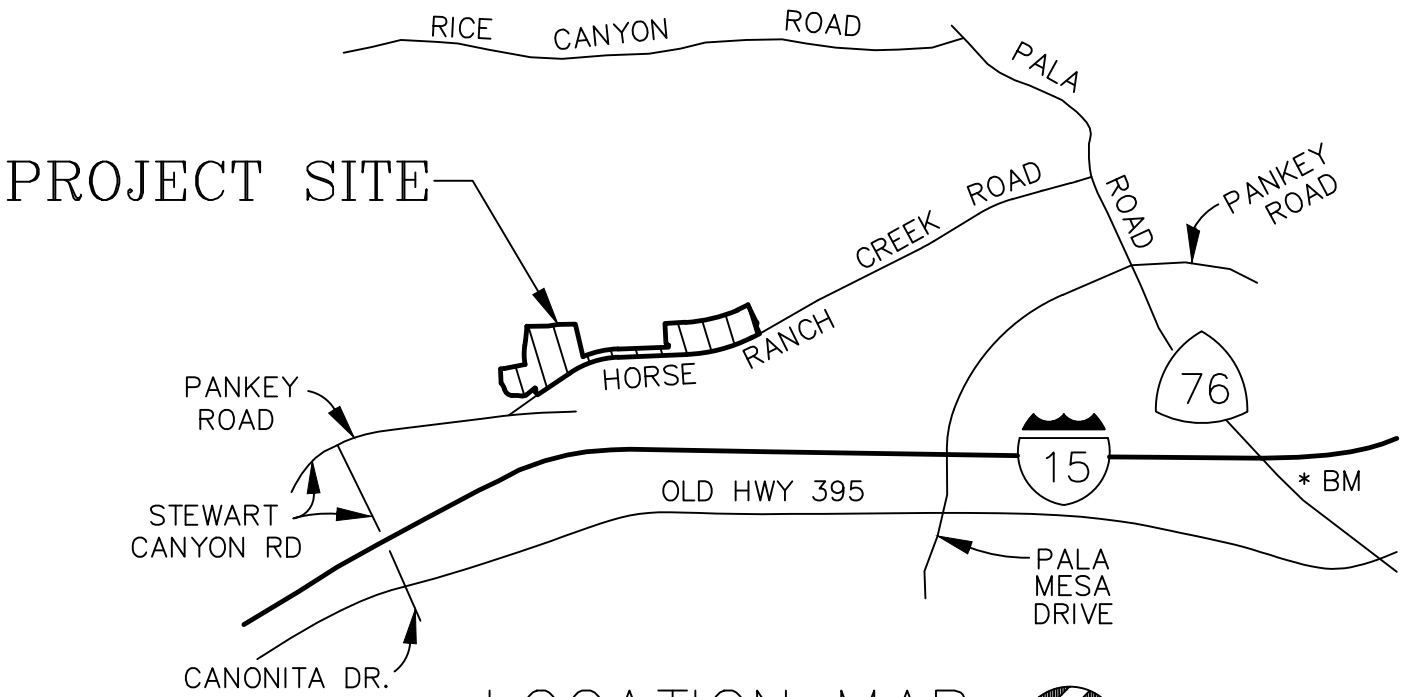
STATE OF CALIFORNIA)
COUNTY OF _____)

On _____ before me, _____Notary Public, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

EXHIBIT “A”

- PROJECT VICINITY MAP
- PROJECT SITE MAP
- DMA MAP BOOK

VICINITY MAP

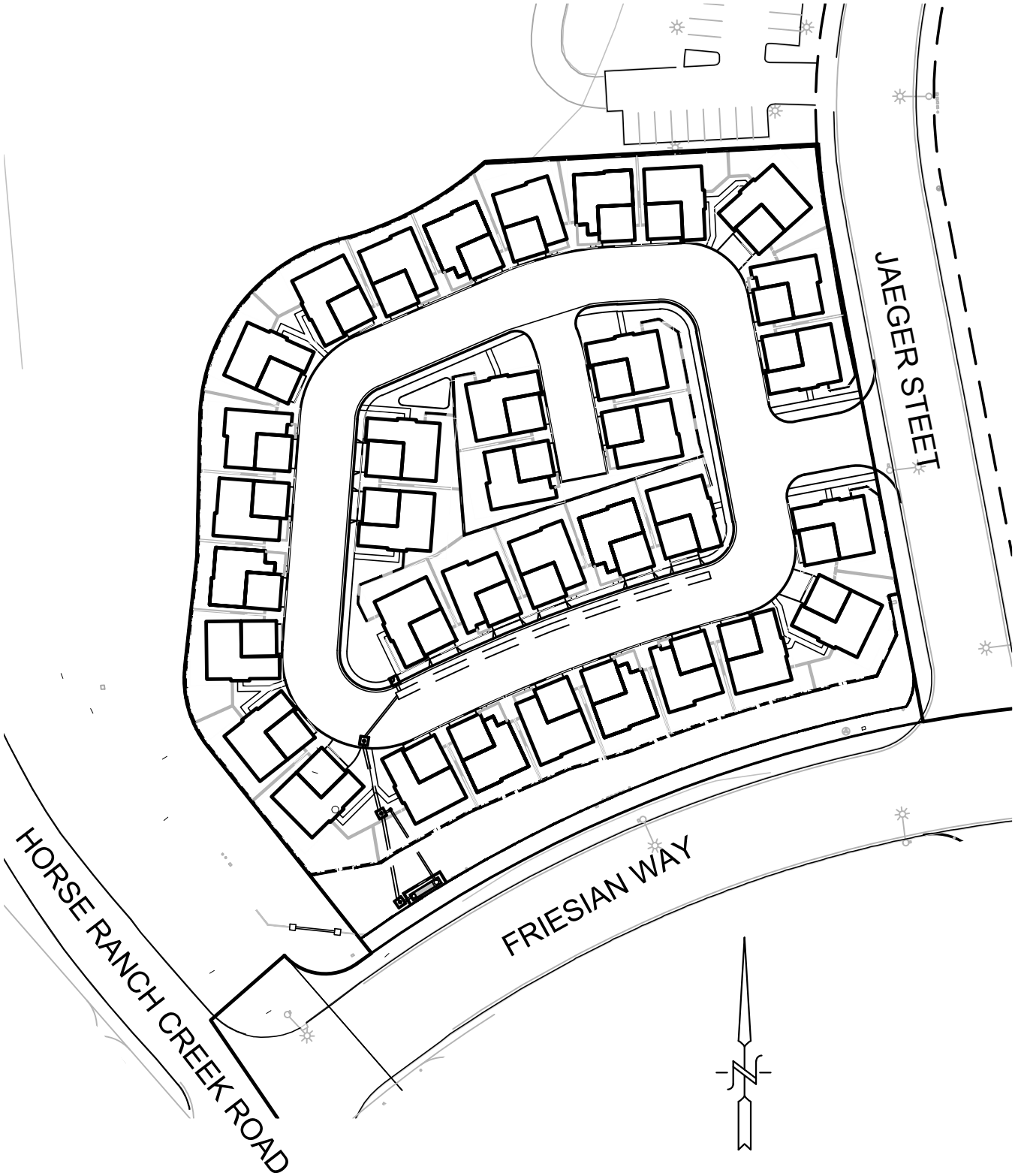


LOCATION MAP

NOT TO SCALE

FALLBROOK, THOMAS GUIDE
PG. 1028 H–4, 5, 6, & 7
PG. 1048 H–1 & 2

SITEPLAN



80 40 0 80 160 240

SCALE: 1" = 80'

DMA MAPBOOK - DMA A

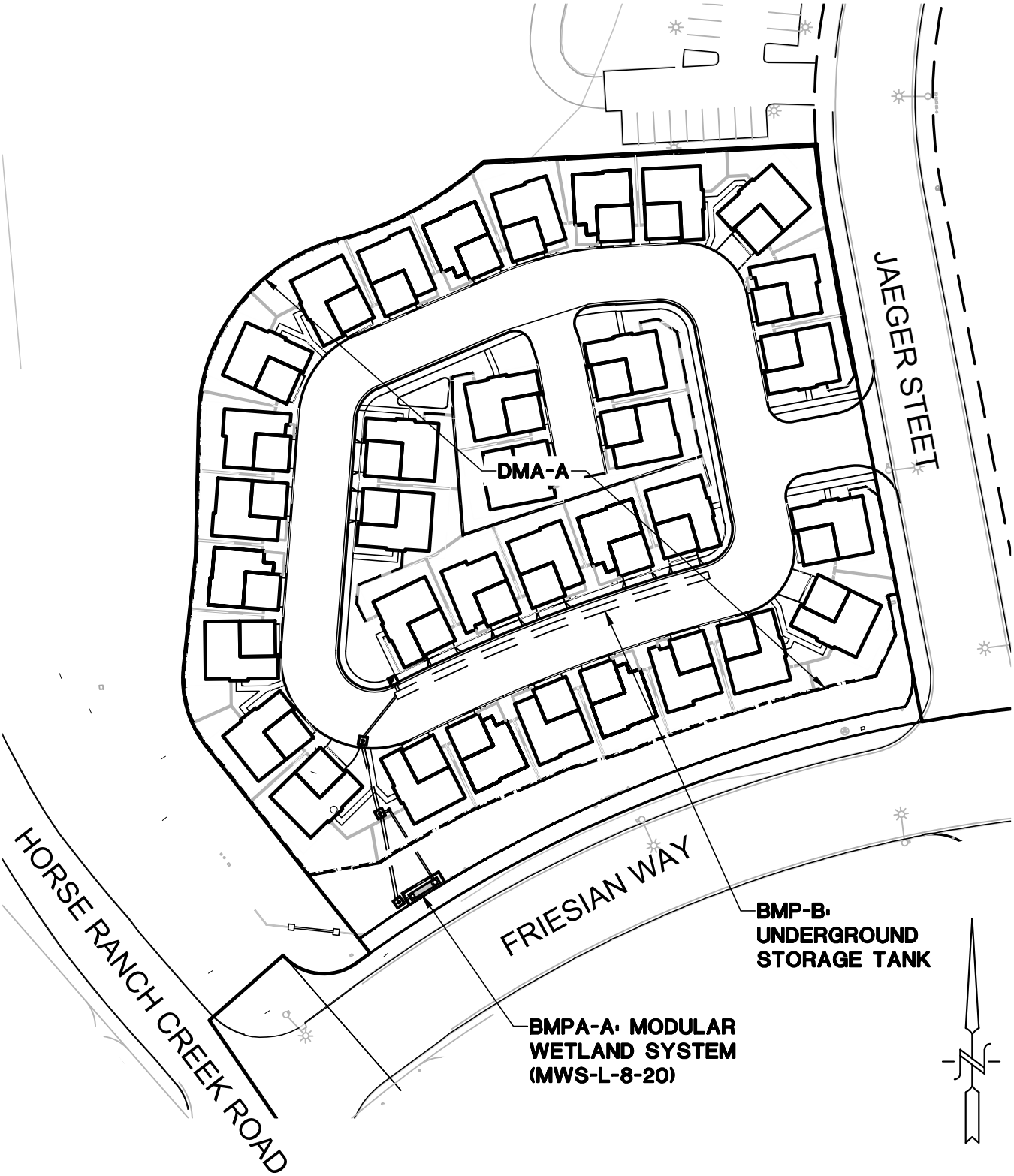


EXHIBIT “B”

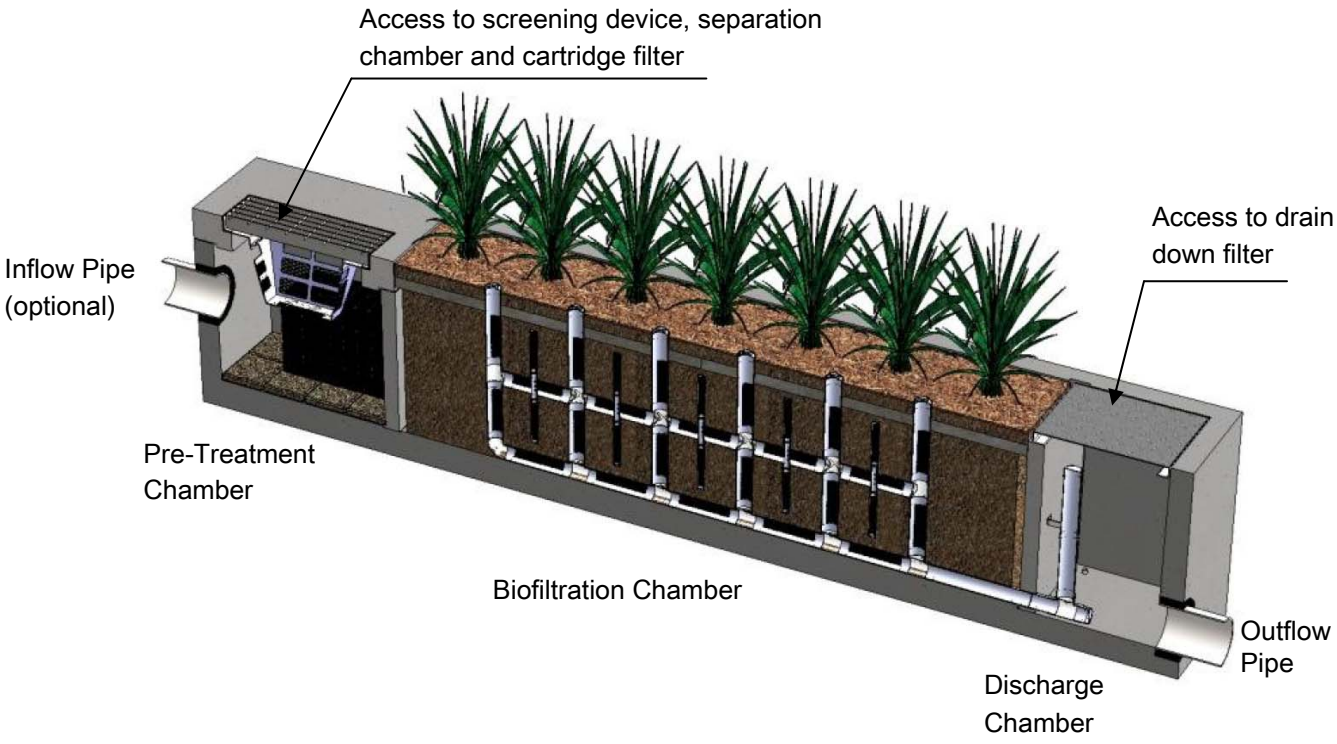
BMP MAINTENANCE PLAN

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

StormTech
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual

THE MOST ADVANCED NAME IN WATER MANAGEMENT SOLUTIONS™

ADS®

THE ISOLATOR® ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

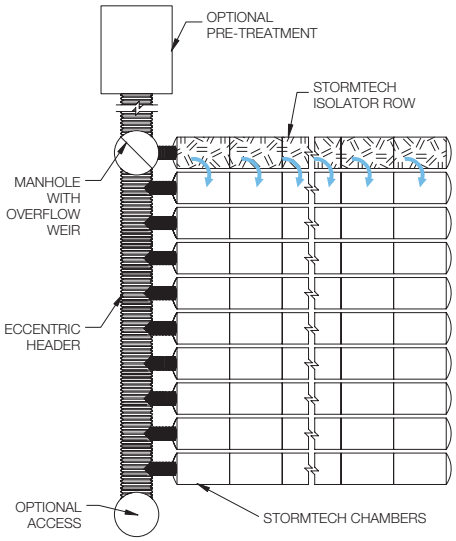
The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

StormTech Isolator Row with Overflow Spillway (not to scale)



ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

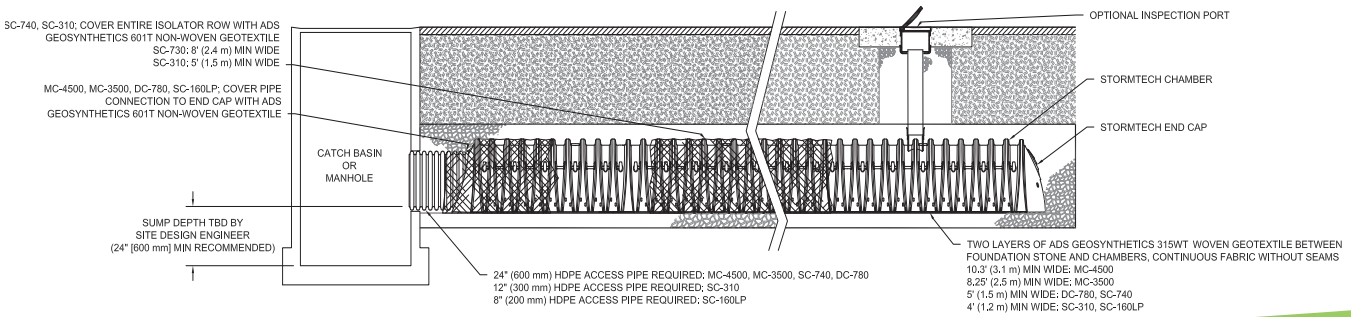
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



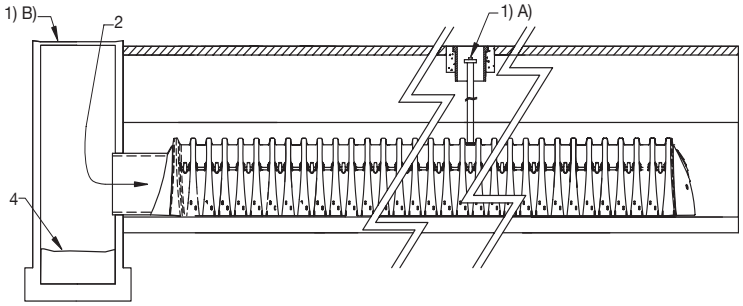
ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1
Inspect Isolator Row for sediment.
- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
  - i. Remove cover from manhole at upstream end of Isolator Row
  - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    1. Mirrors on poles or cameras may be used to avoid a confined space entry
    2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2
Clean out Isolator Row using the JetVac process.
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

STEP 3
Replace all caps, lids and covers, record observations and actions.

STEP 4
Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

StormTech® Detention • Retention • Water Quality
A division of ADS

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

StormTech Maintenance Log

Project Name:
Location:

	Stadia Rod Readings				
Date	**Fixed point to chamber bottom (1)**	**Fixed point to top of sediment (2)**	**Sediment Depth (1) - (2)**	**Observations / Actions**	**Inspector**