



County of San Diego

Stormwater Quality Management Plan (SWQMP)

For Priority Development Projects (PDPs)

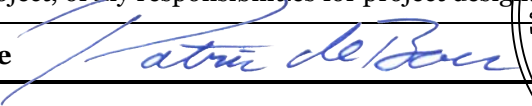
Use for all PDPs (see Stormwater Intake Form, Part 4)



Project Information		Development type ☒ New development ☐ Redevelopment	
Project Name	Fallbrook Self Storage		
Project Address	1305 East Mission Road, Fallbrook, CA 92028		
Assessor's Parcel # (APN)	105-410-18-00		
Permit # / Record ID	PDS2025-LDGRMJ-30561		
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	
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SWQMP Preparer	
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PE Number (if applicable)	83583

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	
Date	August 07, 2026

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

- ☒ **a. SWQMP addresses the entire project**
- ☐ **b. SWQMP implements requirements of an earlier master SWQMP submittal**
- ☐ **c. First of multiple SWQMP submittals**

Required Documentation

No additional documentation.

Include a copy of the previous submittal as **Attachment 4**.

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	1/21/2025	Initial Submittal
2	8/28/2025	2nd Submittal
3	11/26/2025	3rd Submittal
4	4/6/2026	4th Submittal
Final Design		
1	12/17/2025	Initial Submittal
2	2/19/2026	2nd Submittal
3	4/6/2026	3rd Submittal
4	6/16/2026	4th Submittal
		5 submittal 8/07/2026
Plan Changes		
1	Date	Initial Submittal
2	Date	Summary of Change
3	Date	Summary of Change
No.	Date	Summary of Change

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**.
- *Green Streets PDP Exemption* Select if a portion of the PDP is exempt from hydromodification management requirements per BMPDM Section 1.4.3. Document the exemption in **Attachment 13**.

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, 6 and Appendix K.

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 5.3, 5.4, App K)
 - 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 13)

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.

Note that Attachment 13 (Green Streets PDP Exempt Form) is required for projects that propose a mix of Green Street Surfaces and Non-Green Street Surfaces, thus applying both the PDP Performance standards and Green Street Performance Standards.

Projects that exclusively propose Green Street Surfaces are required to complete a Green Streets PDP Exempt SWQMP.

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.

11. Attachment 13: Green Streets PDP Exempt Form

Refer to BMPDM Section 1.4.3. Complete the project description and performance standard calculations found in Appendix K.2.1 of the BMP Design Manual. Include supporting DMA Exhibits in Attachment 2 delineating new impervious areas, existing/replaced impervious areas, and removed impervious areas as needed to support the green street PDP exempt area performance calculations. Include Green Street BMPs in Installation Verification and Maintenance Agreement in **Attachment 10** and **Attachment 11**.

PDP SWQMP Submittal Checklist

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

☒ Table 1: Baseline BMPs for Existing and Proposed Site Features	Page 2
☒ Table 2: Baseline BMPs for Pollutant-generating Sources	Page 3
☒ Table 3: Explanations and Justifications for Table 1 and 2 Baseline BMPs	Page 4
☒ Table 4: DMA Structural Compliance Strategies and Documentation	Page 5
☒ Table 5: Critical Coarse Sediment Yield Area (CCSYA) Requirements	Page 6
☒ Table 6: Minimum Construction Stormwater BMPs	Page 7
☒ Table 7: Explanations and Justifications for Construction Phase BMPs	Page 8

SWQMP Attachments¹: 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)
- ☒ Attachment 13: Green Streets PDP Exempt Form

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.		
☐ Natural waterbodies ☐ Natural storage reservoirs & drainage corridors ☐ Natural areas, soils, & vegetation (incl. trees) Conserve natural features (SD-G) ☐ ☐ ☐ Provide buffers around waterbodies (SD-H) ☐ --- ---			
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.		
☒ Streets and roads ☒ Sidewalks & walkways ☒ Parking areas & lots ☒ Driveways ☐ Patios, decks, & courtyards ☐ Hardcourt recreation areas ☐ Other: a. Direct runoff to pervious areas (SD-B) ☒ ☒ ☒ ☒ ☐ ☐ ☐ b. Construct surfaces from permeable materials (SD-I) ☐ ☐ ☐ ☐ ☐ ☐ ☐ c. Minimize the size of impervious areas ☐ Check this box to confirm that all impervious areas on the site will be minimized where feasible. <i>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.</i>			
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	Natural waterbodies	There are no natural waterbodies running through the site.
BMP	SD-G, SD-H	
Feature	Natural storage reservoirs & drainage corridors	There are no natural storage reservoirs and drainage corridors running through the site.
BMP	SD-G, SD-H	
Feature	Natural soils, areas, and vegetation	The existing vegetation cannot be conserved in the proposed conditions due to the proposed land use. New drought-tolerant, sustainable landscaping will be installed on site.
BMP	SD-G, SD-H	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	

Table 4: DMA Structural Compliance Strategies and Documentation

Part A – Selection and Application Structural Performance Standards		
1. Selection of Standards (see BMPDM Sections 1.4.3, and 6.1) ☒ a. Pollutant control + hydromodification ☐ b. Pollutant control only (project is exempt from hydromodification requirements) ☒ c. Green Streets PDP Exemption - pollutant control only (applicable portions exempt from hydromodification requirements)		
2. Application of Structural Performance Standards (select one; see BMPDM Section 1.7) ☒ New Development Projects: Standards apply to <u>all impervious surfaces</u> . ☐ Redevelopment Projects: Complete the calculations below. Select <u>the</u> applicable scenario based on the results.		
a. Existing impervious area (ft²)	b. Impervious area created / replaced (ft²)	c. % Impervious created / replaced [(b/a)*100]
☐ <i>Scenario 1: c is 50% or more:</i> Performance standards apply to all impervious surfaces (a + b). ☐ <i>Scenario 2: c is less than 50%:</i> 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	Att. 7	Att. 8	Att. 9	Att. 10	Att. 11	Att. 12	Att. 13
	DMAs without Structural BMPs	DMAs w/ Structural Pollutant Control BMPs	DMAs w/ Structural Hydromod. BMPs	Critical Coarse Sediment Yield Areas	BMP Installation Verification Form	Maintenance Agreements/ Plans	Alternative Compliance Projects	Green Streets PDP Exempt Form
☐ 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 5.3, 5.4, App K)		☒		☒	☒	☒		☒
☒ Hydromodification Control BMPs (BMPDM Chapter 6)			☒	☒	☒	☒		
☐ Alternative Compliance Project (BMPDM Section 1.8)				☐	☐	☐	☐	
☐ Please check this box after you complete this list. Corresponding attachments will be automatically selected on the right.								

- 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 requirements⁶ 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		References	
Select all applicable activities and at least one BMP for each.		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 Management¹³			
☒ 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	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	



County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 1: Stormwater 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 **Stormwater Intake Form Instructions** for additional guidance and explanation of terms.

Part 1. Project Information		
Project Name:	Fallbrook Self Storage	
Record ID (Permit) No(s):	PDS2025-LDGRMJ-30561	
Assessor's Parcel No(s):	105-410-18-00	
Street Address (or Intersection):	1305 East Mission Road	
City, State, Zip:	Fallbrook, CA 92028	

Part 2. Applicant / Project Proponent Information		
Name:	Andrew Bertha	
Company:	Boulder Ridge Capital	
Street Address:	3220 Grey Hawk Ct.	
City, State, Zip:	Carlsbad, California 92010	
Phone Number	(760) 519-0566	
Email:	andrew@boulderridgecapital.com	

Part 3. Required Information for All Development Projects			
(A)	1. Existing (pre-development) impervious surfaces (ft²)	2. Created or replaced impervious surfaces (ft²)	3. Total disturbed area (acres or ft²)
	0	185,558	5.76 acres
(B)	☒ 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

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

- ☐ a. Project is East of the Pacific/Salton Sea Divide
- ☐ b. None of the PDP criteria below applies

☒ **Priority Development Project (PDP)****→ PDP SWQMP Form/ PDP SWQMP Amendment required with scope change**

- ☐ 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

Refer to Section 1.4 of the [County BMP Design Manual](#) for additional guidance.☐ **Green Streets PDP Exemption²****→ Green Streets PDP Exempt SWQMP Form**Select this option only if the entire project qualifies for Green Streets PDP Exemption. Refer to Section 1.4.3 of the [County BMP Design Manual](#) for additional guidance.**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:

Rogelio Ruiz

Date: 04/06/2026

- **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.



County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 2: DMA Exhibits and Construction Plans

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, 9, and/or 13) or combined into one or more consolidated exhibits. Hatching or other variations in symbology shall be used to differentiate different surface types when an exhibit is demonstrating compliance with two or more performance standards, for example, PDP and green street performance standards.
- Use this checklist to ensure required information is included on each exhibit (copy as needed).

DMA Exhibit ID #:	DMA Plan, Sheet # C8 & C9	
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, Green Street 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 site design BMPs	
	☒ Green street PDP exempt areas – new impervious areas, existing/replaced impervious areas, and removed impervious areas	
B. Proposed Features and BMPs Specific to Individual SWQMP Attachments³		
☒ 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
☒ Attachment 13	☒ Green Street pollutant control BMPs	

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.

BMP-1 STAGE vs AREA			
BMP-1 BASIN AREA = 2450 SF			
BMP-1 TOTAL VOLUME = 7426 CF			
DEPTH (FT)	ELEVATIONS (FT)	AREA (SF)	NOTES
0-1.0	767.0-768.0	980	2450 SF X 0.40 (GRAVEL POROSITY)
1.0-2.75	768.0-769.75	490	2450 SF X 0.20 (SOIL POROSITY)
2.75	769.75	2450	FINISH GRADE ELEVATION
3.50	770.75	2850	SURFACE PONDING
4.50	771.75	3700	SURFACE PONDING
5.50	772.75	4605	SURFACE PONDING

BMP-2 STAGE vs AREA			
BMP-1 BASIN AREA = 1940 SF			
BMP-1 TOTAL VOLUME = 6766 CF			
DEPTH (FT)	ELEVATIONS (FT)	AREA (SF)	NOTES
0-1.0	764.0-765.0	776	2450 SF X 0.40 (GRAVEL POROSITY)
1.0-2.75	765.0-766.75	388	2450 SF X 0.20 (SOIL POROSITY)
2.75	766.75	1940	FINISH GRADE ELEVATION
3.50	767.75	2405	SURFACE PONDING
4.50	768.75	3370	SURFACE PONDING
5.50	769.75	4390	SURFACE PONDING

SITE DESIGN BMP - TREE WELL DATA TABLE							
TREE WELL #	TRIBUTARY BASIN	CANOPY DIAMETER	# OF TREES	AMENDED SOIL DEPTH	REQUIRED TREE WELL SOIL AREA (SF/TREE)	REQUIRED RETENTION VOLUME (CF)	PROPOSED RETENTION VOLUME (CF)
TREE WELL-1	DMA-3	20 FT	8	2.5 FT	251 SF	1,375 CF	180 CF

GREEN STREET BMP DATA TABLE						
TREE WELL #	TRIBUTARY BASIN	CANOPY DIAMETER	# OF TREES	AMENDED SOIL DEPTH	REQUIRED TREE WELL SOIL AREA (SF/TREE)	TREE WELL VOLUME REDUCTION (CF/TREE)
GREEN STREET BMP TREE	DMA-4	20 FT	1	2.5 FT	251 SF	180

TREE WELL NOTE
THE AMENDED SOIL AREA FOR ALL TREES, (TREETWELLS AND GREENSTREET TREE) IS 8.35 FT WIDE BY 31.5 FT LONG

DMA DATA TABLE				
DMA-NO.	TOT. AREA (SF)	IMPERVIOUS (%)	DESIGN DCV (CF)	TYPE/TREATED BY
DMA-1	118,274	86	4,377	BMP-1
DMA-2	89,273	78	3,000	BMP-2
DMA-3	20,743	5	494	TREE WELL-1
DMA-4	3,318	100	139	GREEN STREET BMP TREE
DMA-5	18,730	0	0	SELF-MITIGATING
OFF-1	123,490	0	0	EXISTING AREA BYPASS

TREATMENT BMP DATA TABLE			
BMP#	TRIBUTARY DMA	PROPOSED FOOTPRINT (SF)	DESCRIPTION
BMP-1	DMA-1	2,450	FULLY LINED BIOFILTRATION BASIN W/ 2" LOW FLOW ORIFICE
BMP-2	DMA-2	1,940	FULLY LINED BIOFILTRATION BASIN W/ 1-1/2" LOW FLOW ORIFICE

BMP INSPECTION SCHEDULE NOTES

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

- PRIOR TO START OF CONSTRUCTION OF BIOFILTRATION AREA
- PRIOR TO CONSTRUCTION OF OUTLET STRUCTURES
- AFTER GRADING OF THE BASIN AREA FOR CERTIFICATION
- AFTER PLACEMENT OF IMPERMEABLE LINER (W/ EXTRA LENGTH FOR EMBEDMENT)
- AFTER PLACEMENT OF SUB-DRAIN
- AFTER THE PLACEMENT OF GRAVEL DRAINAGE LAYER
- AFTER PLACEMENT OF TREATMENT SOIL
- AFTER IRRIGATION AND LANDSCAPING ACTIVITIES

*SURVEY STAKES SHALL BE AVAILABLE FOR EACH AND EVERY INSPECTION

SITE DESIGN BMPs

THE FOLLOWING SITE DESIGN BMP'S ARE TO BE UTILIZED FOR DESIGN:

1. SD-4 MINIMIZE SOIL COMPACTION AT ALL LANDSCAPE AREAS
2. SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES AT ALL LANDSCAPE LOCATIONS.

SOURCE CONTROL BMPs

STORM DRAIN STENCILING

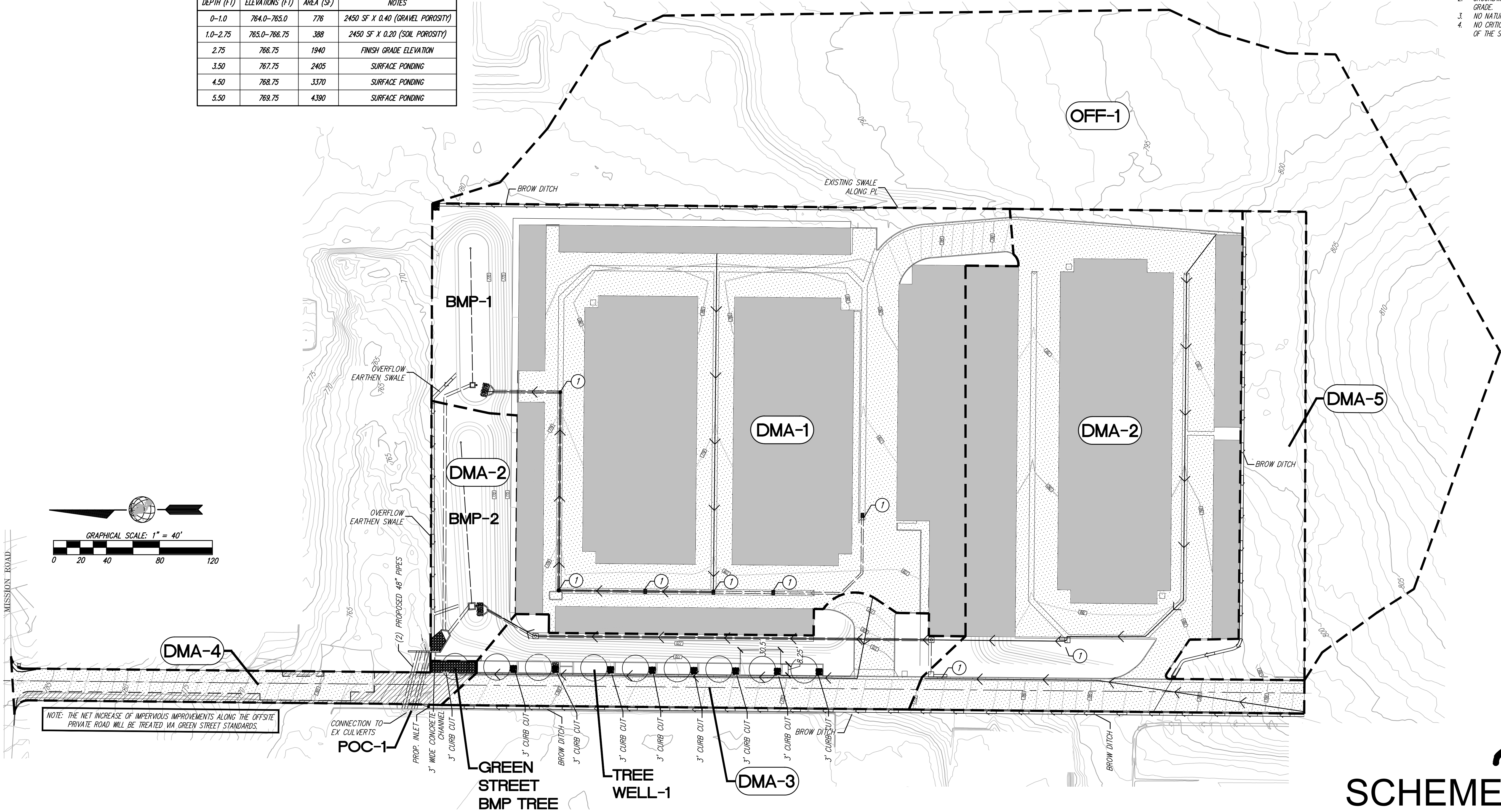
1

LEGEND

- DMA BOUNDARY. DMA-#
- DRAINAGE MANAGEMENT AREA NO.
- BUILDING AREA
- IMPERVIOUS AREA
- NET INCREASE IMP. AREA OF OFFSITE IMPROVEMENTS.
- PERVIOUS AREA
- DRAINAGE ARROWS
- BEST MANAGEMENT PRACTICE. BMP-#

NOTES

1. UNDERLYING NRCS HYDROLOGIC SOIL GROUP FOR SITE IS TYPE D.
2. GROUNDWATER DEPTH WAS ENCOUNTERED AT APPROXIMATELY 12.5 FEET BELOW EXISTING GRADE.
3. NO NATURAL HYDROLOGIC FEATURES EXIST ON THE SITE
4. NO CRITICAL COARSE SEDIMENT YIELD AREAS EXISTING ON-SITE OR ARE LOCATED UP-STREAM OF THE SITE.



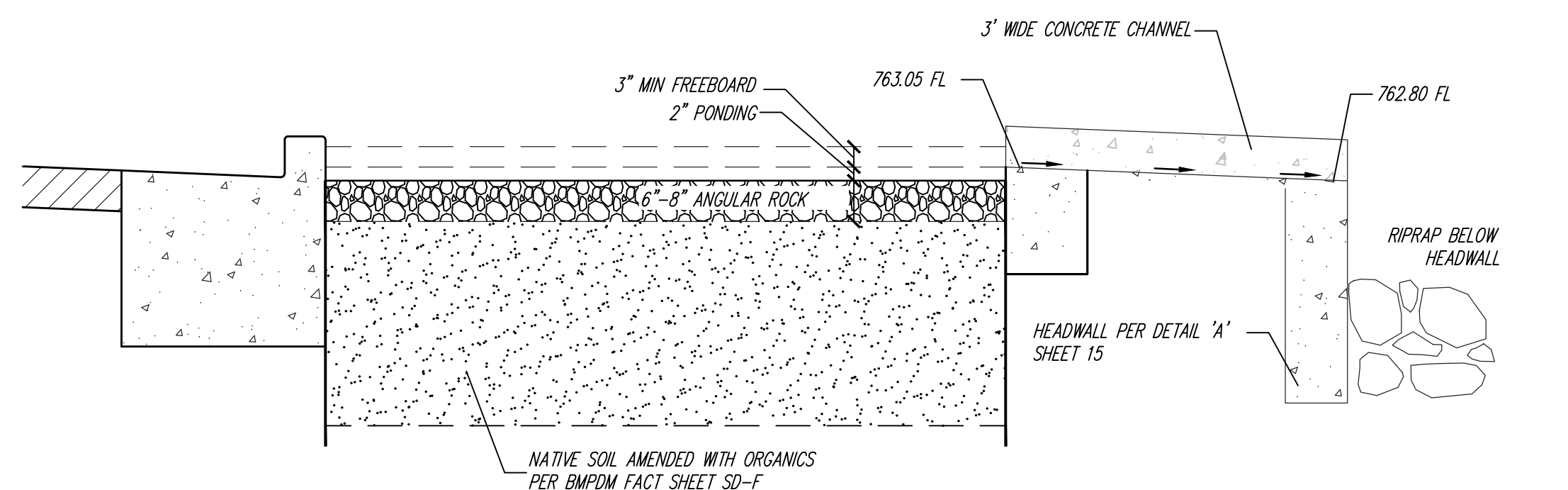
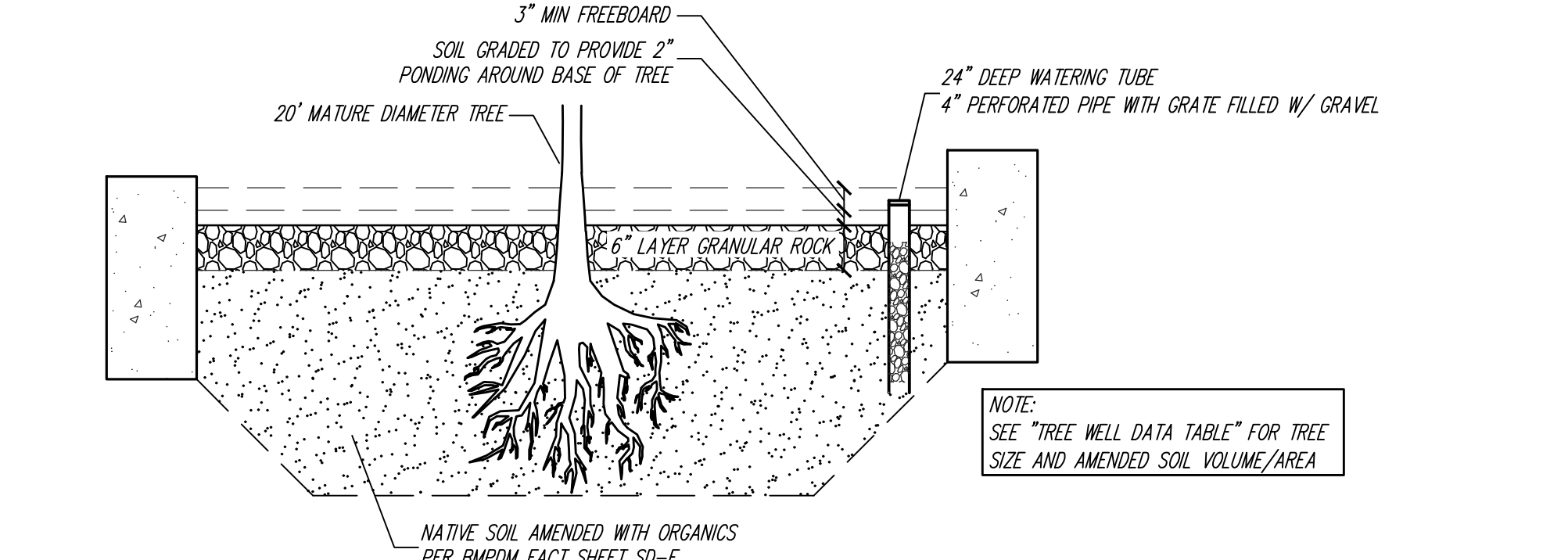
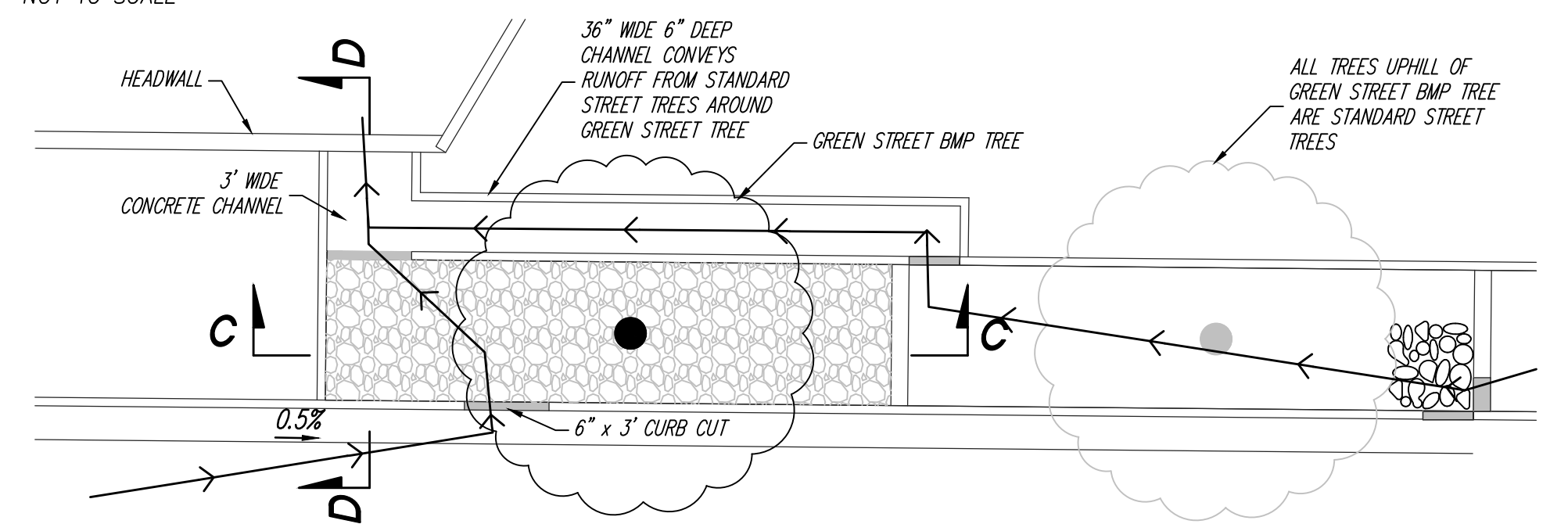
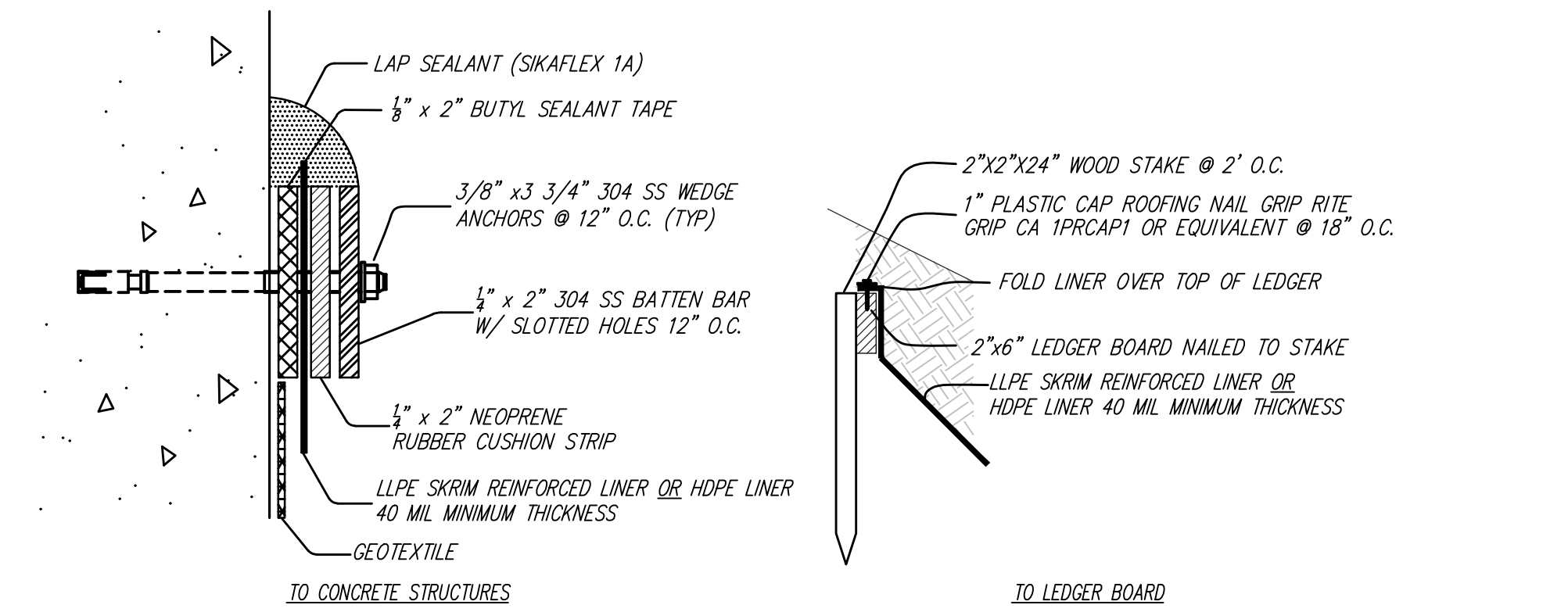
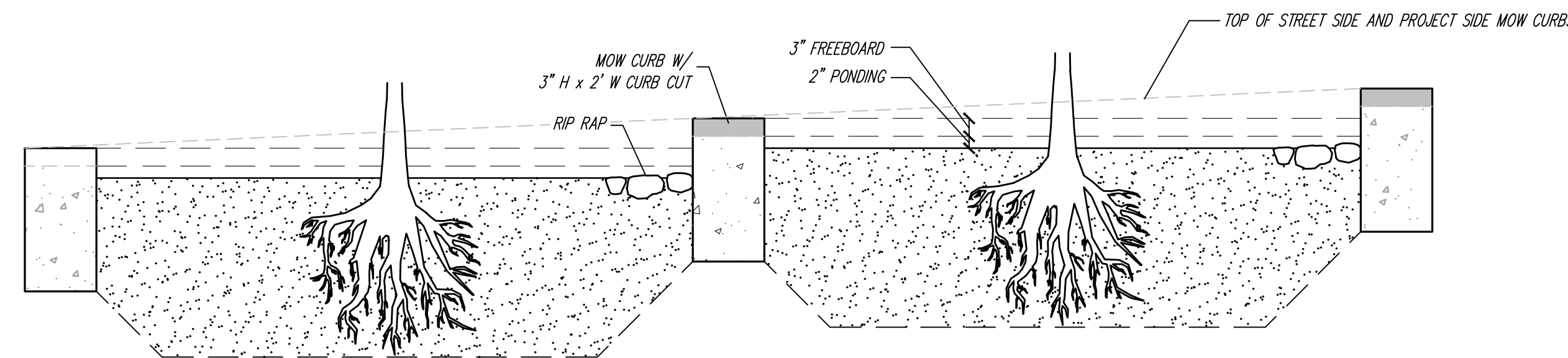
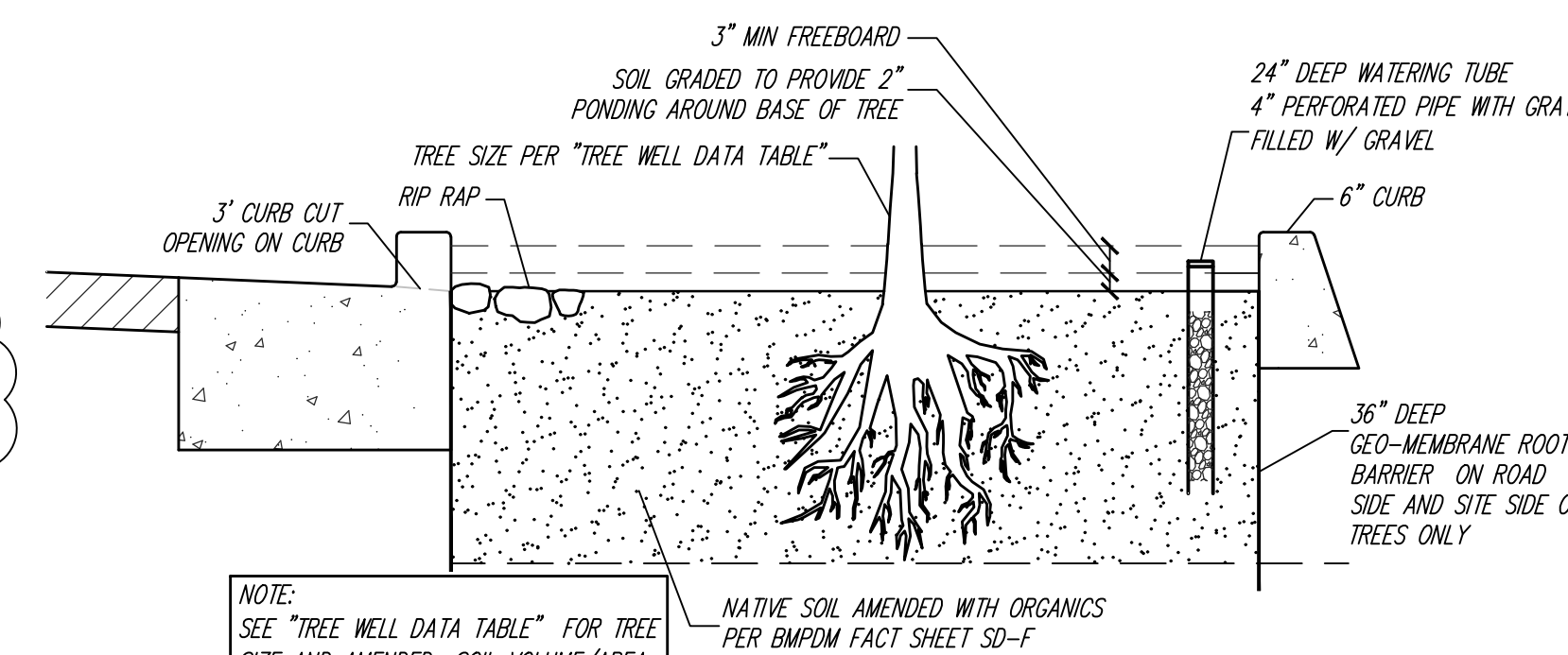
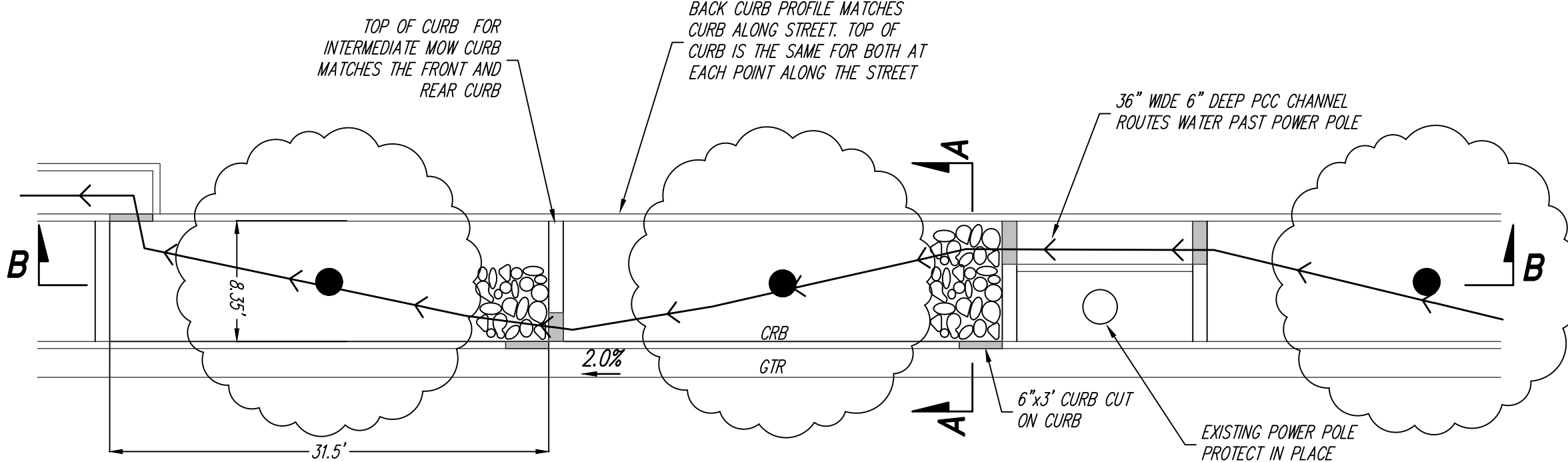
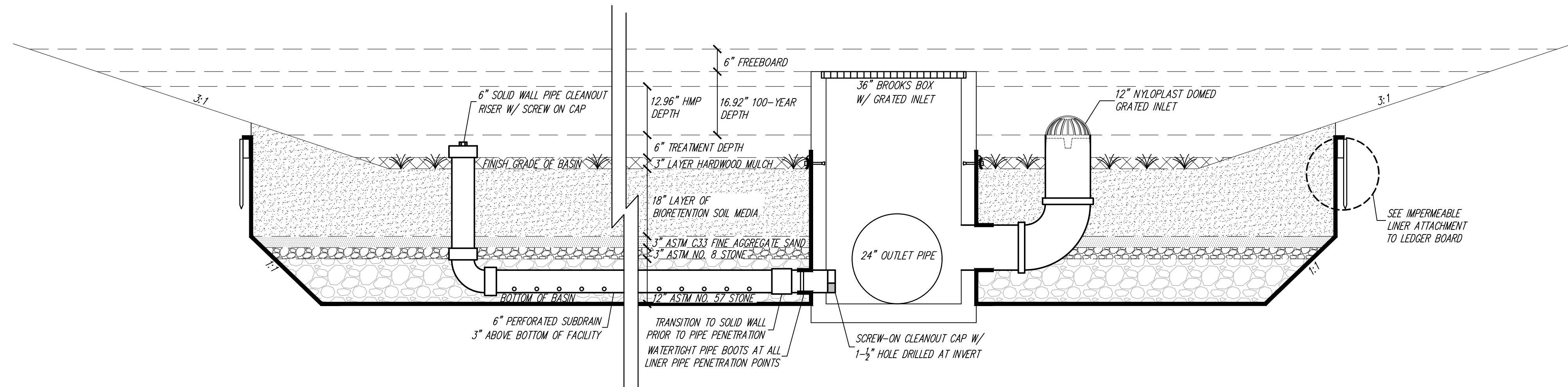
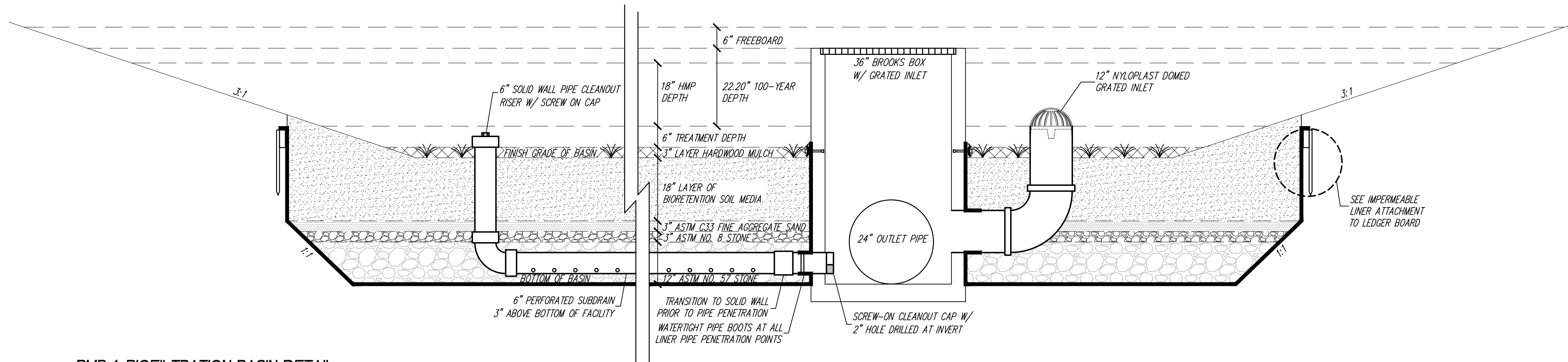
MISSION ROAD SELF STORAGE
FALLBROOK, CA

SCHEME C
DMA MAP

JOB NUMBER: 24-719
SCALE: N/A
DATE: 08/06/2026

OMEGA
ENGINEERING CONSULTANTS
4320 VIEWRIDGE AVE. SUITE C
SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

Jordan
ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090



MISSION ROAD SELF STORAGE FALLBROOK, CA

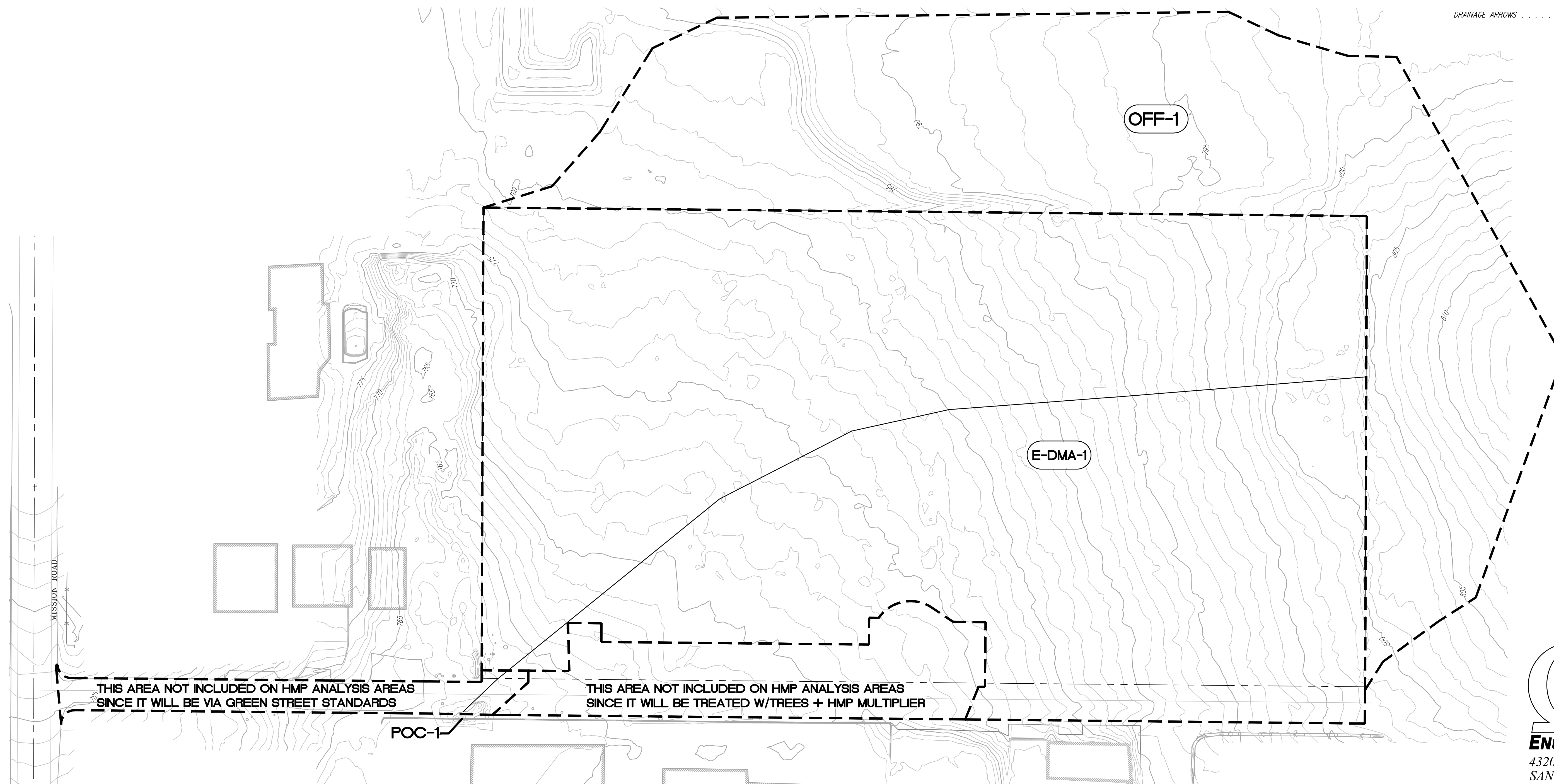
OMEGA
ENGINEERING CONSULTANTS
4320 VIEWRIDGE AVE. SUITE C
SAN DIEGO, CA 92123
PH: (858) 634-8620 FAX: (858)-634-8627

SCHEME C BMP DETAILS

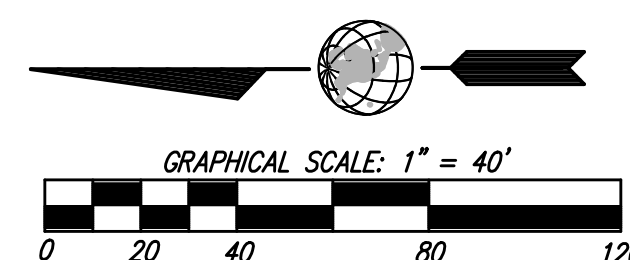
JOB NUMBER: 24-719
SCALE: N/A
DATE: 08/06/2026

Jordan Architects
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

LEGEND	
DMA BOUNDARY	---
DRAINAGE MANAGEMENT AREA NO.	(E-DMA-#)
IMPERVIOUS AREA	▨
PERVIOUS AREA	□
DRAINAGE ARROWS	→



ΩMEGA
ENGINEERING CONSULTANTS
 4320 VIEWRIDGE AVE. SUITE C
 SAN DIEGO, CA 92123
 PH: (858) 634-8620 FAX: (858)-634-8627



MISSION ROAD SELF STORAGE

FALLBROOK, CA

PRE-DEVELOPED
HMP EXHIBIT

SCHEME C

JOB NUMBER: 24-719
 SCALE: N/A
 DATE: 08/06/2026

ja
JORDAN
ARCHITECTS
 131 CALLE IGLESIA, SUITE 100
 SAN CLEMENTE, CA 92672
 949.388.8090

Channel Report

36 inch overflow channel to headwall

Rectangular

Bottom Width (ft) = 3.00
Total Depth (ft) = 0.50

Invert Elev (ft) = 100.00
Slope (%) = 1.00
N-Value = 0.015

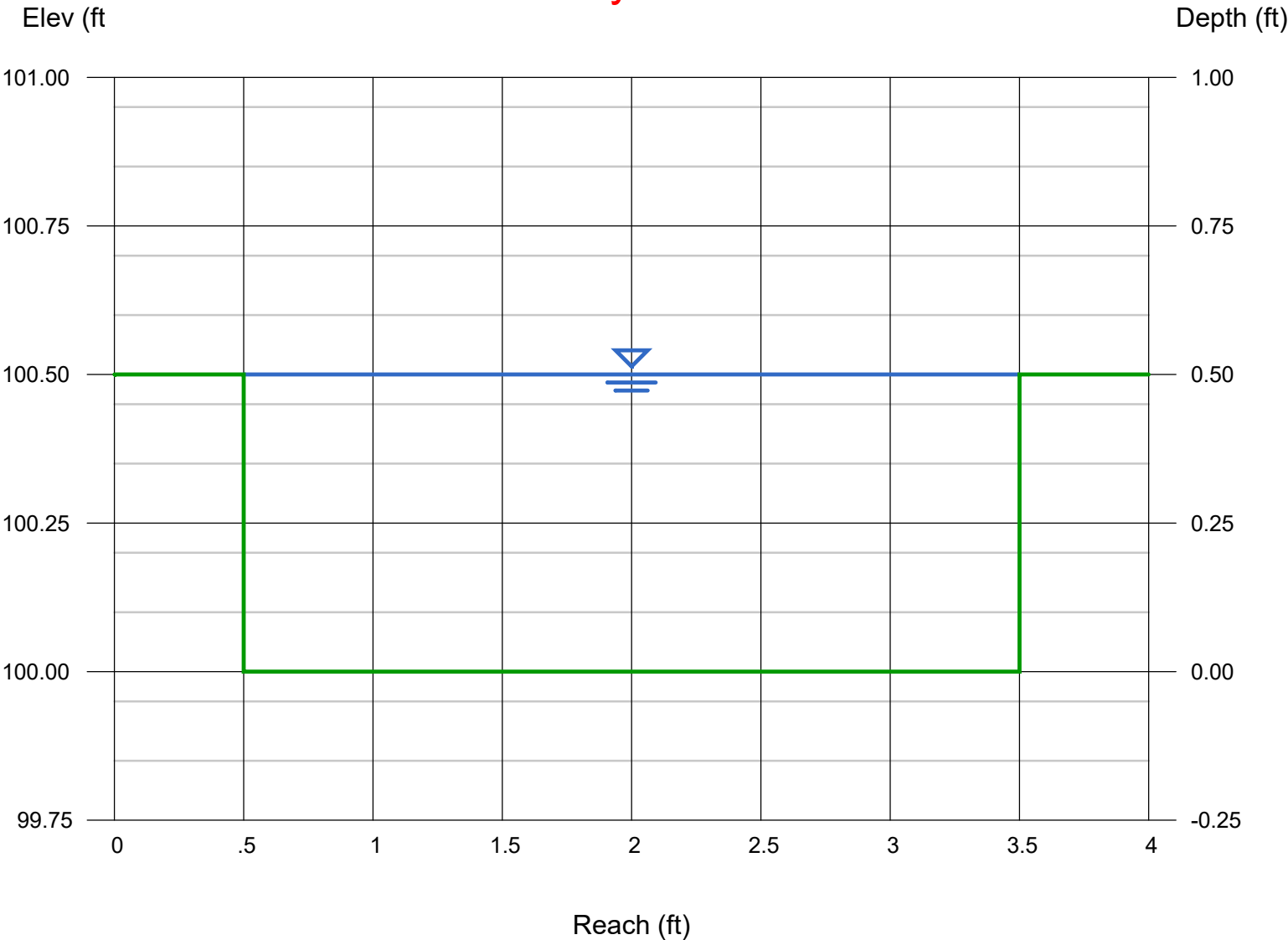
Calculations

Compute by: Known Depth
Known Depth (ft) = 0.50

Highlighted

Depth (ft) = 0.50
Q (cfs) = 7.725
Area (sqft) = 1.50
Velocity (ft/s) = 5.15
Wetted Perim (ft) = 4.00
Crit Depth, Yc (ft) = 0.50
Top Width (ft) = 3.00
EGL (ft) = 0.91

The max capacity of the overflow channel to the headwall is 7.725 cfs. The total Q100 from DMA-3 and 4 combined is only 4.5 cfs. The 36" wide channel is sufficiently sized.



Weir Report

Curb Cut max capacity

Rectangular Weir

Crest = Sharp
Bottom Length (ft) = 3.00
Total Depth (ft) = 0.50

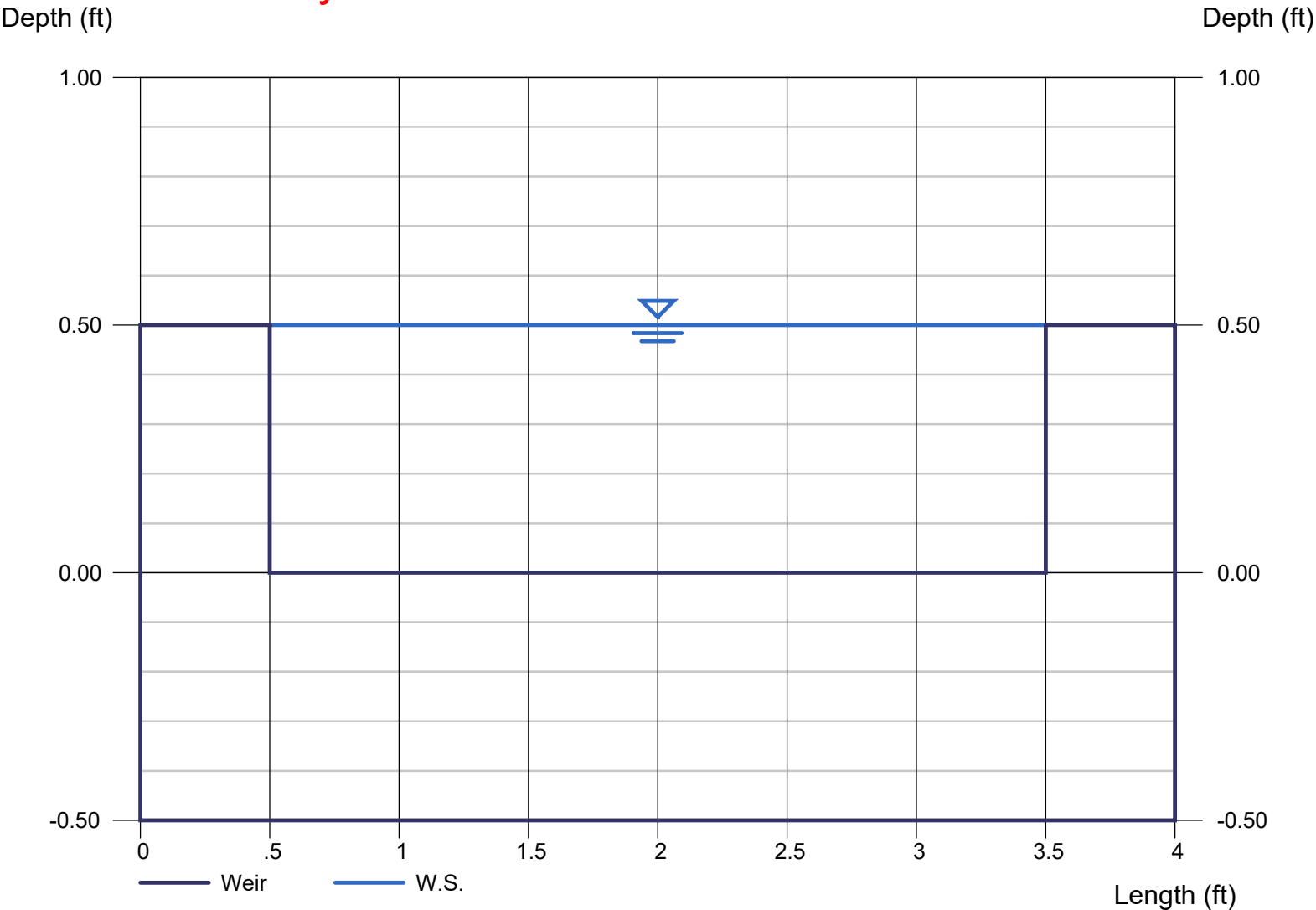
Highlighted

Depth (ft) = 0.50
Q (cfs) = 3.532
Area (sqft) = 1.50
Velocity (ft/s) = 2.35
Top Width (ft) = 3.00

Calculations

Weir Coeff. Cw = 3.33
Compute by: Known Depth
Known Depth (ft) = 0.50

The max capacity of a single 36" wide curb cut is 3.532 cfs. The max flow directed to any single curb cut is 2.04 cfs. The curb cuts are sufficiently sized.



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.

☐	<u>All Mapbooks are attached</u>
☒	<u>All Mapbooks are in Attachment 11</u>

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	Conceptual Grading Plans
Required Information⁴	
☒ 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>

THE FOLLOWING IS A LIST OF ALL EASEMENTS, SERVITUDES, RIGHTS OF WAY, ACCESS, AND OTHER SURVEY RELATED DOCUMENTS THAT BURDEN THE SUBJECT PROPERTY WHICH ARE LISTED UNDER THE EXCEPTIONS FOR THE ABOVE REFERENCED PRELIMINARY REPORT. ITEMS THAT CAN BE PLOTTED ARE SHOWN HEREON.

(A) INDICATES EXCEPTION ITEM IS PLOTTABLE AND SHOWN HEREON.

-

AC	ASPHALT CONCRETE	LSCAPE	LANDSCAPE
ARCH	ARCHITECTURAL	MH	MANHOLE
B	BACKLARD	N	NORTH
BFP	BACK FLOW PREVENTER	P	PAVEMENT
BWG	BUILDING	PIV	POST INDICATOR VALVE
BLD	BOTTOM OF WALL	PL	PROPERTY LINE
C.B.	CATCH BASIN	POC	POINT OF CONNECTION
CONC	CONCRETE	PP	POWER POLE
CRB	CURB	PROP	PROPOSED
E	EAST	PVT.	PRIVATE
ELEC	ELECTRICAL UTILITIES	RM	RIGHT ELEVATION
E-OH	ELECTRICAL OVERHEAD	R/W	RIGHT-OF-WAY
EX	EXISTING	S	SOUTH
FDC	FIRE DEPARTMENT CONNECTION	SD	STORM DRAIN UTILITIES
FF	FINISH FLOOR	SOMH	STORM DRAIN MANHOLE
FG	FINISH GRADE	SMH	SEWER MANHOLE
FH	FIRE HYDRANT	SNR	SEWER
FL	FLOW LINE	SNK	SIDEWALK
FS	FIRE SERVICE	TC	TOP OF CURB
G	GAS FACILITIES	TW	TOP OF WALL
GTR	GUTTER	W	WEST
IE	INVERT ELEVATION	WM	WATER METER BOX
IRR	IRRIGATION	WTR	WATER
LP	LIGHT POLE	WV	WATER VALVE

NO.	DESCRIPTION
C1	TITLE SHEET / CONSTRAINTS
C2/C3	FIRE SITE PLAN
C4/C5	ROUGH GRADING PLAN
C6/C7	CONCEPT UTILITY PLAN
C8	DMA PLAN
C9	DMA DETAIL
C10	SECTIONS

GRADED AREA	5.92 [ACRES]
MAX FILL	10.10 [FT]
MAX CUT	11.77 [FT]
FILL QUANTITIES	18,755 [CY]
CUT QUANTITIES	12,035 [CY]
UNDERCUT QUANTITIES	7,030 [CY]
SHRINKAGE (10%)	860 [CY]
EXPORT CONDITION	310 [CY]
(*) BIO-BASIN AREA INCLUDED WITHIN UNDERCUTS	

TITLE INFORMATION FOR THIS SURVEY BASED ON A PRELIMINARY REPORT PREPARED BY CALIFORNIA TITLE COMPANY
AS ORDER NO. 400-2307842-37, DATED: JANUARY 24, 2022.

COUNTY OF SAN DIEGO BENCHMARK "POINT 1E-0106"
DESCRIPTION: 0.5IN STEEL PIN IN CONC MON, MKD BY STEEL FENCE POST, SW COR INT ALVARADO & STAGECOACH LN
ELEVATION = 859.843' MSL (NGVD 29)

REAL PROPERTY IN THE UNINCORPORATED AREA OF THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID NORTHWEST QUARTER; THENCE ALONG THE WEST LINE OF SAID NORTHWEST QUARTER, NORTH 0° 02' 20" EAST, 330.00 FEET; THENCE PARALLEL TO THE SOUTH LINE OF SAID NORTHWEST QUARTER, NORTH 89° 44' 30" EAST, 30.00 FEET TO THE TRUE POINT OF BEGINNING; THENCE PARALLEL TO SAID WEST LINE NORTH 0° 02' 20" EAST 660.00 FEET; THENCE PARALLEL TO SAID SOUTH LINE NORTH 89° 44' 30" EAST 630.00 FEET; THENCE PARALLEL TO SAID WEST LINE SOUTH 0° 02' 20" WEST 660.00 FEET; THENCE PARALLEL TO SAID SOUTH LINE SOUTH 89° 30' WEST 630 FEET TO THE TRUE POINT OF BEGINNING.

PARCEL 2:
AN EASEMENT OVER THE EAST 20 FEET OF THE WEST 50 FEET OF SAID NORTHWEST QUARTER, OF THE NORTHEAST QUARTER OF SECTION 19, TOWNSHIP 9 SOUTH, RANGE 3 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, EXCEPT THE SOUTH 980 FEET THEREOF FOR ROAD PURPOSES AND FOR THE PURPOSE OF LAYING AND MAINTAINING PIPE LINES FOR THE TRANSPORTATION OF WATER AND FOR THE PURPOSE OF CONSTRUCTING AND MAINTAINING POWER AND TELEPHONE LINES.

PARCEL 4:
AN EASEMENT AND RIGHT OF WAY FOR ROAD AND FOR UTILITY INSTALLATION AND MAINTENANCE UPON, OVER AND ACROSS THE WEST 30.00 FEET OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 19, TOWNSHIP 9 SOUTH, RANGE 3 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO UNITED STATES GOVERNMENT SURVEY THEREOF APPROVED SEPTEMBER 11, 1879, EXCEPTING THEREFROM THE SOUTH 330 FEET.

OWNER:	SITE ADDRESS:
ARNOLD & EMMA RASHKIN FAMILY TRUST	1305 E MISSION RD
2652 DOS LOMOS	FALLBROOK, CA 92028
FALLBROOK, CA 92028	COUNTY OF SAN DIEGO
COUNTY OF SAN DIEGO	

105-410-18

SOURCE OF TOPOGRAPHY:

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREON ARE BASED ON THE WEST LINE OF THE NORTHWEST QUARTER THE NORTHEAST QUARTER OF SECTION 19, TOWNSHIP 9 SOUTH, RANGE 3 WEST, S.B.B.&M AS SHOWN ON RECORD OF SURVEY NO. 24929, OFFICIAL RECORDS OF SAN DIEGO COUNTY, CA, BEING NORTH 0°33'21" EAST.

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE "X" OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 06073C 0165G, WHICH BEARS AN EFFECTIVE DATE OF 5/12/2012 AND IS NOT IN THE SPECIAL FLOOD HAZARD ZONE

ITEM	SYMBOL
CENTERLINE	_____
RIGHT-OF-WAY	_____
PROPERTY LINE	_____
EX. CONTOUR	_____
EX. SPOT ELEVATION	_____
EX. ELECTRICAL OR COMMUNICATIONS MANHOLE	
EX. SANITARY SEWER & MANHOLE	
EX. WATER	
EX. FIRE HYDRANT ASSEMBLY	
EX. CURB & GUTTER	_____
EX. TREE	
EX. POWER POLE	

ITEM	SYMBOL
RIGHT-OF-WAY / PROPERTY LINE	
PROPOSED CONTOUR	
PROPOSED SLOPE (3:1 MAX)	
PROPOSED BUILDING FOOTPRINT	
PROPOSED FINISH FLOOR ELEVATION	
PROPOSED FINISHED GRADE ELEVATION	
PROPOSED CURB	
PROPOSED PARKING STALLS	

PROPOSED FIRE ACCESS LANE

PROPOSED BIOFILTRATION BASIN

PROPOSED 6" SEWER LATERAL

PROPOSED FIRE HOSE PULL

PROPOSED FIRE HYDRANT ASSEMBLY

PROPOSED SEWER CLEANOUT

PROPOSED 8" FIRE LATERAL

PROPOSED WTR SERVICE

PROPOSED DOMESTIC/IRRIGATION BACKFLOW

PROPOSED FIRE SERVICE BACKFLOW

PROPOSED IRRIGATION POINT OF CONNECTION

PROPOSED SEWER POINT OF CONNECTION



SIZE & TYPE PER PLAN





















THE PROPERTY OWNER(S) AND BENEFICIARY PARTIES (HEREAFTER "OWNER") SHALL, TO THE FULLEST EXTENT PERMITTED BY LAW, OFFERED, INDEMNIFY, AND HOLD HARMLESS THE COUNTY OF SAN DIEGO AND ITS OFFICERS, AGENTS, EMPLOYEES, AND REPRESENTATIVES ("COUNTY PARTIES") FROM AND AGAINST ALL CLAIMS, LIABILITIES, DEMANDS, DAMAGES, LOSSES, COSTS (INCLUDING ATTORNEYS FEES AND LITIGATION EXPENSES), AND CAUSES OF ACTION OF ANY KIND OR NATURE THAT ARISE FROM OR RESULT FROM THE DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, REPAIR, OR USE OF THE PRIVATE ROAD EASEMENT CONNECTING THE PROJECT SITE TO EAST MAIN ROAD--INCLUDING ALL COMMERCIAL USES--TO THE EXTENT CAUSED BY THE ACTS OR OMISSIONS OF OWNER OR ANY THIRD PARTY.

THIS INDEMNIFICATION OBLIGATION SURVIVES THE EXPIRATION OR TERMINATION OF THE EASEMENT OR PROJECT APPROVAL AS TO CLAIMS ARISING FROM ACTS OR OMISSIONS OCCURRING PRIOR TO THE LATER OF SUCH EXPIRATION OR TERMINATION. THIS NOTE IMPLEMENTS CONDITION PLAN#2. THE OBLIGATIONS UNDER THIS NOTE ARE COEXTENSIVE WITH, AND SHALL NOT EXCEED, THE OBLIGATIONS SET FORTH IN CONDITION PLAN#2.



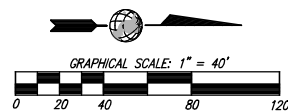
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SAN DIEGO, CA 92123
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JORDAN
ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

MISSION ROAD SELF STORAGE

FALLBROOK, CA



SCHEME C

TITLE & CONSTRAINT MAP

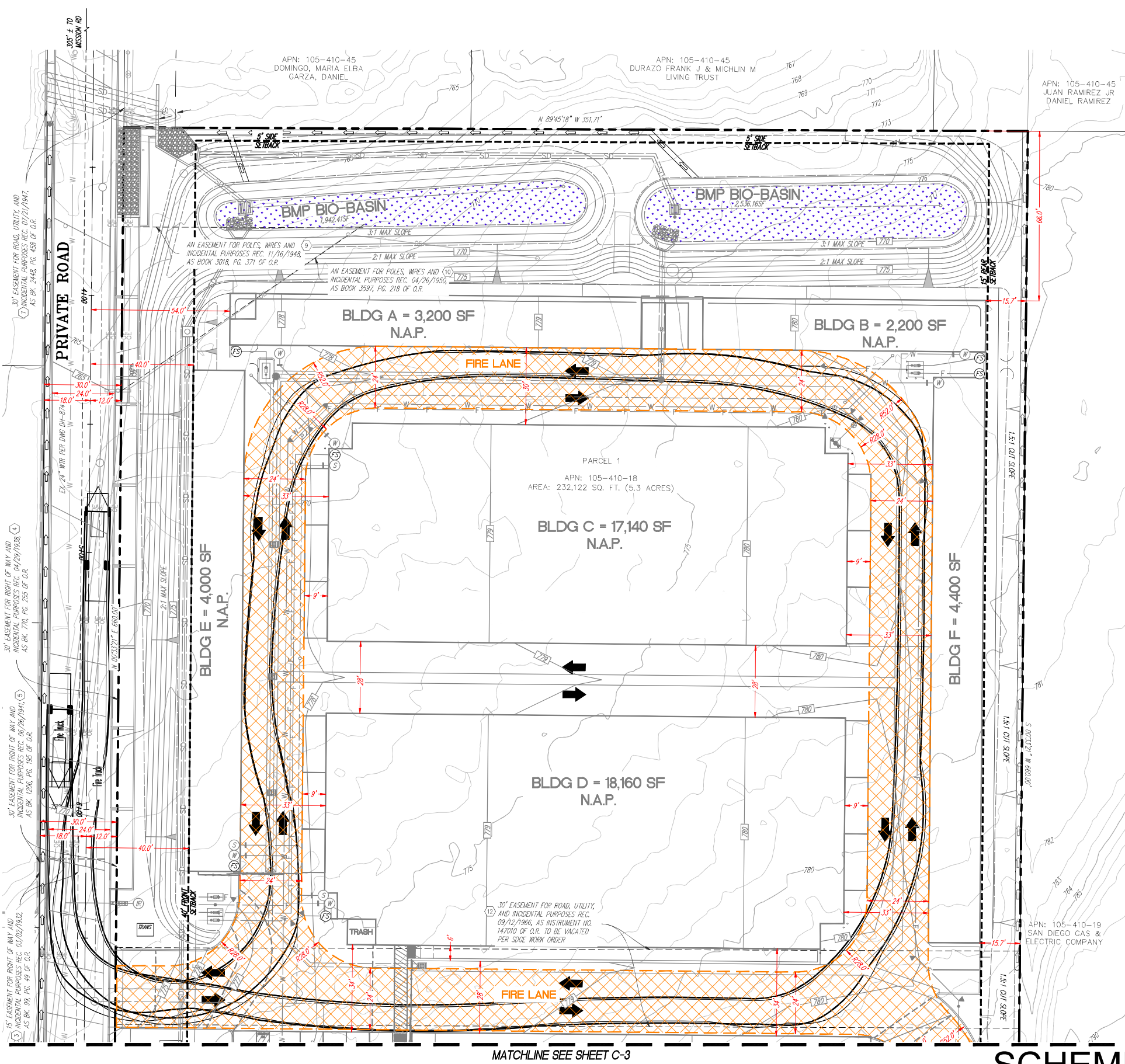
JOB NUMBER: 24-719
SCALE: N/A
DATE: 08/05/2026

EASEMENT + EXCEPTIONS NOTES:

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INDICATES EXCEPTION ITEM IS PLOTTABLE AND SHOWN HEREON.

- 3 AN EASEMENT FOR RIGHT OF WAY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED MARCH 02, 1932 AS BOOK 98, PAGE 48 OF OFFICIAL RECORDS. SAID ITEM LIES OUTSIDE OF THE SUBJECT PROPERTY BUT IS SHOWN HEREON FOR INFORMATIONAL PURPOSES.
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- 5 AN EASEMENT FOR RIGHT OF WAY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JUNE 26, 1941 AS BOOK 1206, PAGE 195 OF OFFICIAL RECORDS. SAID ITEM APPEARS TO BENEFIT THE SUBJECT PROPERTY AND IS THEREFORE SHOWN HEREON.
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- 7 AN EASEMENT FOR ROAD, UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JULY 21, 1947 AS BOOK 2448, PAGE 458 OF OFFICIAL RECORDS. SAID ITEM APPEARS TO BENEFIT THE SUBJECT PROPERTY AND IS THEREFORE SHOWN HEREON.
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- 12 AN EASEMENT FOR ROAD, UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED SEPTEMBER 12, 1966 AS INSTRUMENT NO. 147010 OF OFFICIAL RECORDS. SAID ITEM IS PARTIALLY ILLEGIBLE AND IS THEREFORE SHOWN HEREON IN ITS APPROXIMATE LOCATION.
- 13 AN EASEMENT FOR THE TRANSMISSION, DISTRIBUTION OF ELECTRICITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED MAY 20, 1975 AS INSTRUMENT NO. 122723 OF OFFICIAL RECORDS. SAID ITEM REFERENCES A DOCUMENT THAT WAS NOT PROVIDED TO THE SURVEYOR (BOOK 1924, PAGE 261); THEREFORE SAID ITEM IS NOT PLOTTED HEREON AT THIS TIME.



EXISTING LEGEND:

ITEM	SYMBOL
CENTERLINE	---
RIGHT-OF-WAY	---
PROPERTY LINE	---
EX CONTOUR	---
EX SPOT ELEVATION	965.8'
EX ELECTRICAL OR COMMUNICATIONS MANHOLE	---
EX SANITARY SEWER & MANHOLE	---
EX WATER	---
EX FIRE HYDRANT ASSEMBLY	---
EX CURB & GUTTER	---
EX TREE	---
EX POWER POLE	---

PROPOSED LEGEND:

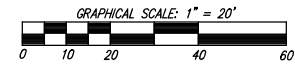
ITEM	SYMBOL
RIGHT-OF-WAY / PROPERTY LINE	---
PROPOSED CONTOUR	---
PROPOSED SLOPE (3:1 MAX)	---
PROPOSED BUILDING FOOTPRINT	---
PROPOSED FINISH FLOOR ELEVATION	FF-52.00
PROPOSED FINISHED GRADE ELEVATION	374.00FG
PROPOSED CURB	---
PROPOSED PARKING STALLS	---
PROPOSED FIRE ACCESS LANE	---
PROPOSED BIOFILTRATION BASIN	---
PROPOSED 6" SEWER LATERAL	---
PROPOSED FIRE HOSE PULL	---
PROPOSED FIRE HYDRANT ASSEMBLY	---
PROPOSED SEWER CLEANOUT	---
PROPOSED 8" FIRE LATERAL	---
PROPOSED WTR SERVICE	---
PROPOSED DOMESTIC/IRRIGATION BACKFLOW	---
PROPOSED FIRE SERVICE BACKFLOW	---
PROPOSED IRRIGATION POINT OF CONNECTION	---
PROPOSED SEWER POINT OF CONNECTION	---

FIRE FLOW AND HYDRANT REQUIREMENTS:

- FIRE FLOW IS 2,500 GPM FOR A 2 HOUR DURATION AT 20PSI
- FIRE HYDRANT SPACING IS 450 LINEAL FEET ALONG THE FIRE LANES
- FIRE SPRINKLER REQUIRED IN ALL STRUCTURES

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ja
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949.388.8090



MISSION ROAD SELF STORAGE FALLBROOK, CA

SCHEME C FIRE SITE PLAN

JOB NUMBER: 24-719
SCALE: N/A
DATE: 07/31/2026

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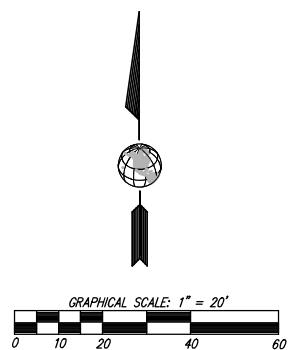
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SCHEME C FIRE SITE PLAN



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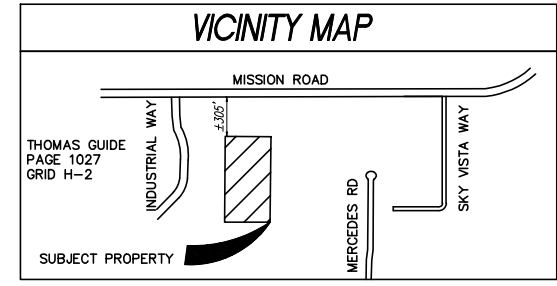
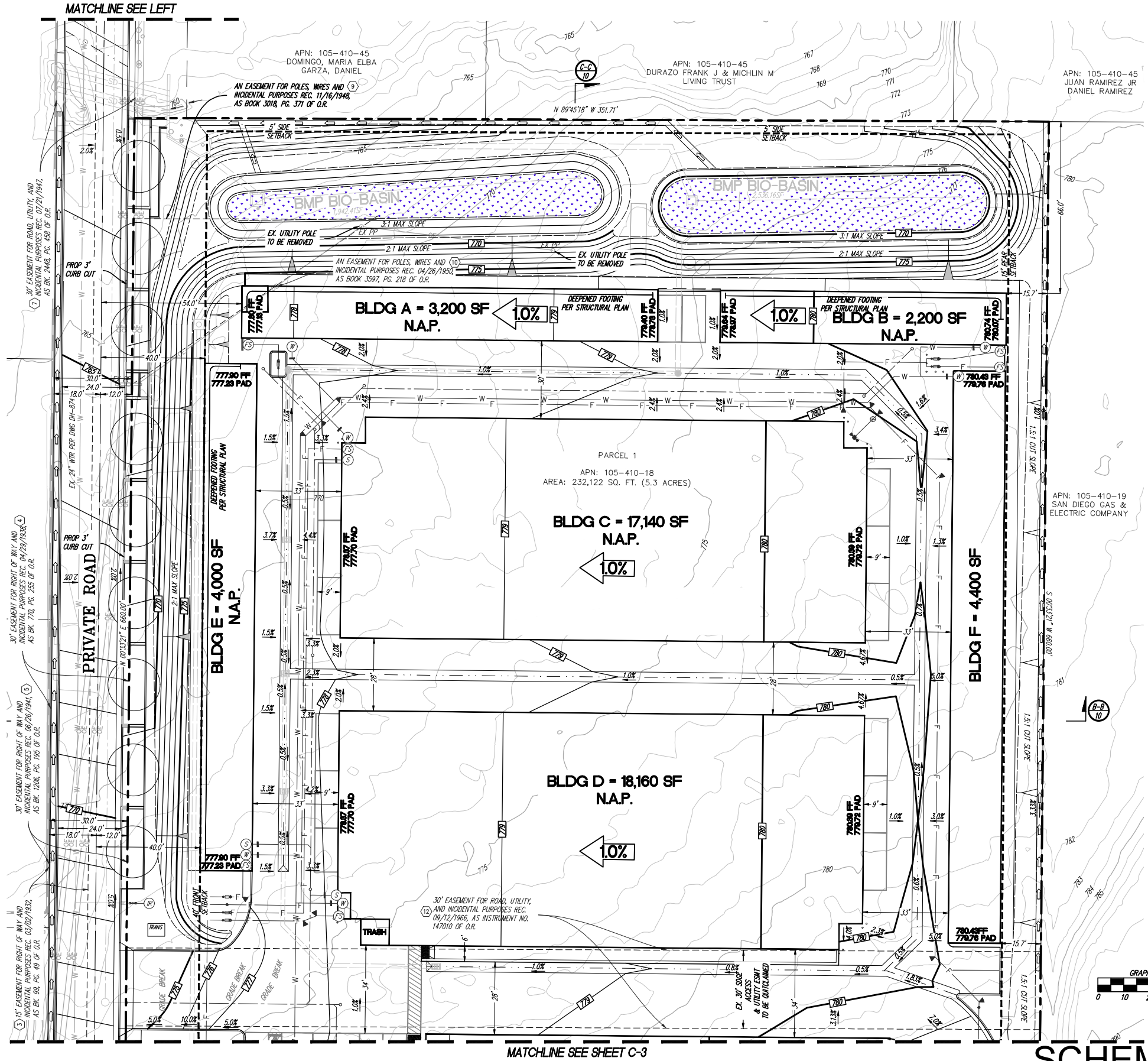
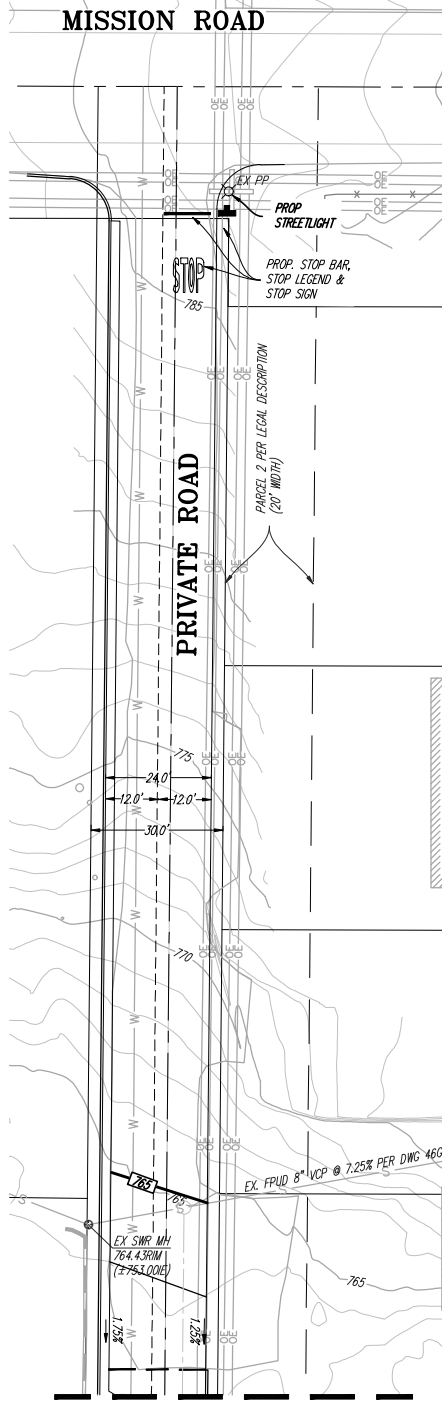
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SAN CLEMENTE, CA 92672
949.388.8090

BER: 24-719
N/A
07/29/2026

C-3



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LOT COVERAGE:

PARCEL AREA: 232,122 SF (5.33 ACRES)
DISTURBED PROJECT AREA: 235,224 SF (5.40 ACRES)
IMPERVIOUS AREA: 188,028 SF
PERVIOUS AREA: 47,196 SF
% IMPERVIOUS: 81%

OMEGA
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4320 VIEWRIDGE AVE. SUITE C
SAN DIEGO, CA 92123
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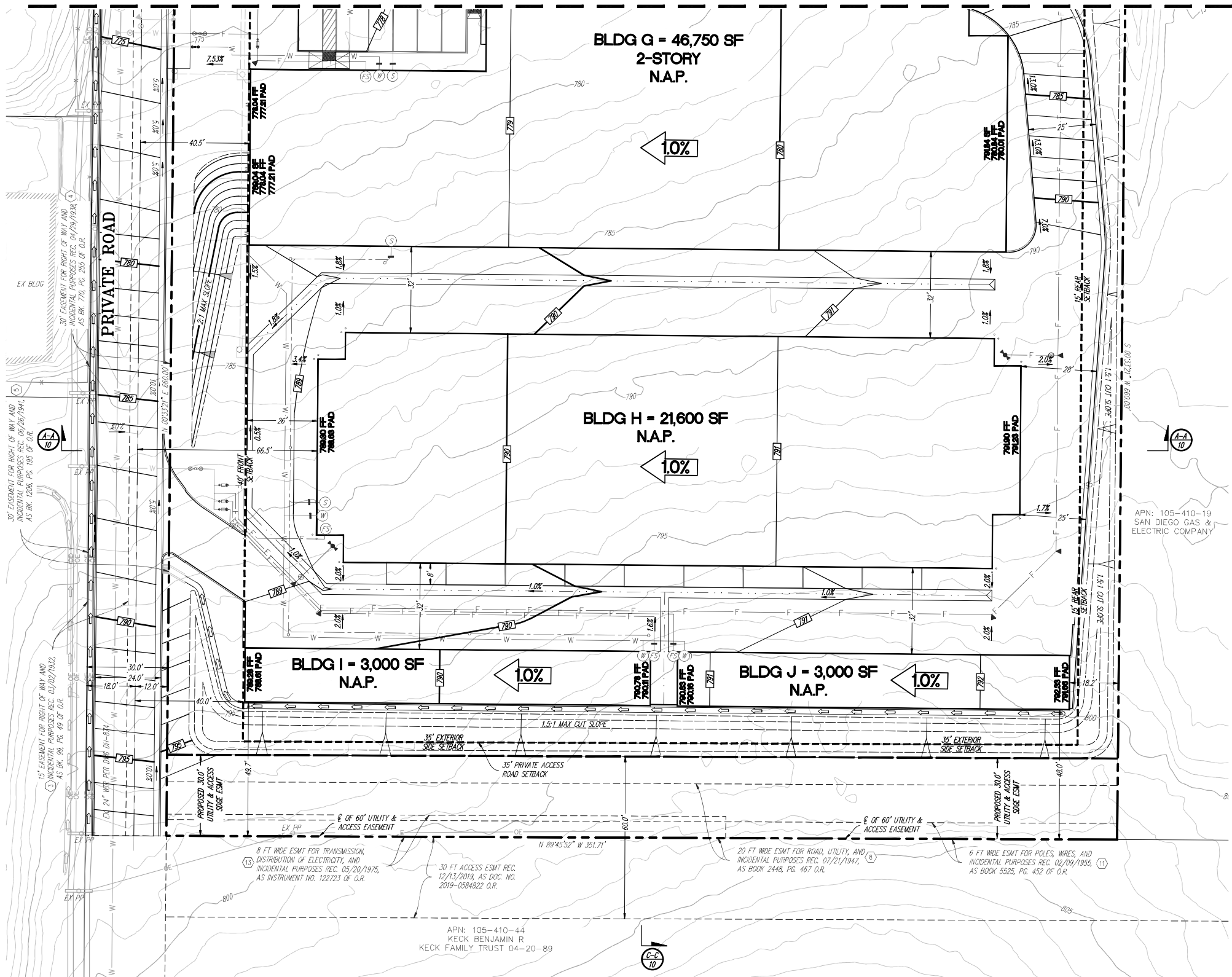
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MISSION ROAD SELF STORAGE FALLBROOK, CA

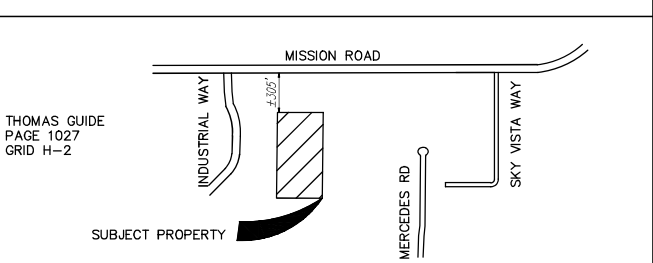
SCHEME C CONCEPTUAL GRADING

JOB NUMBER: 24-719
SCALE: N/A
DATE: 07/29/2026

MATCHLINE SEE SHEET C-4



VICINITY MAP



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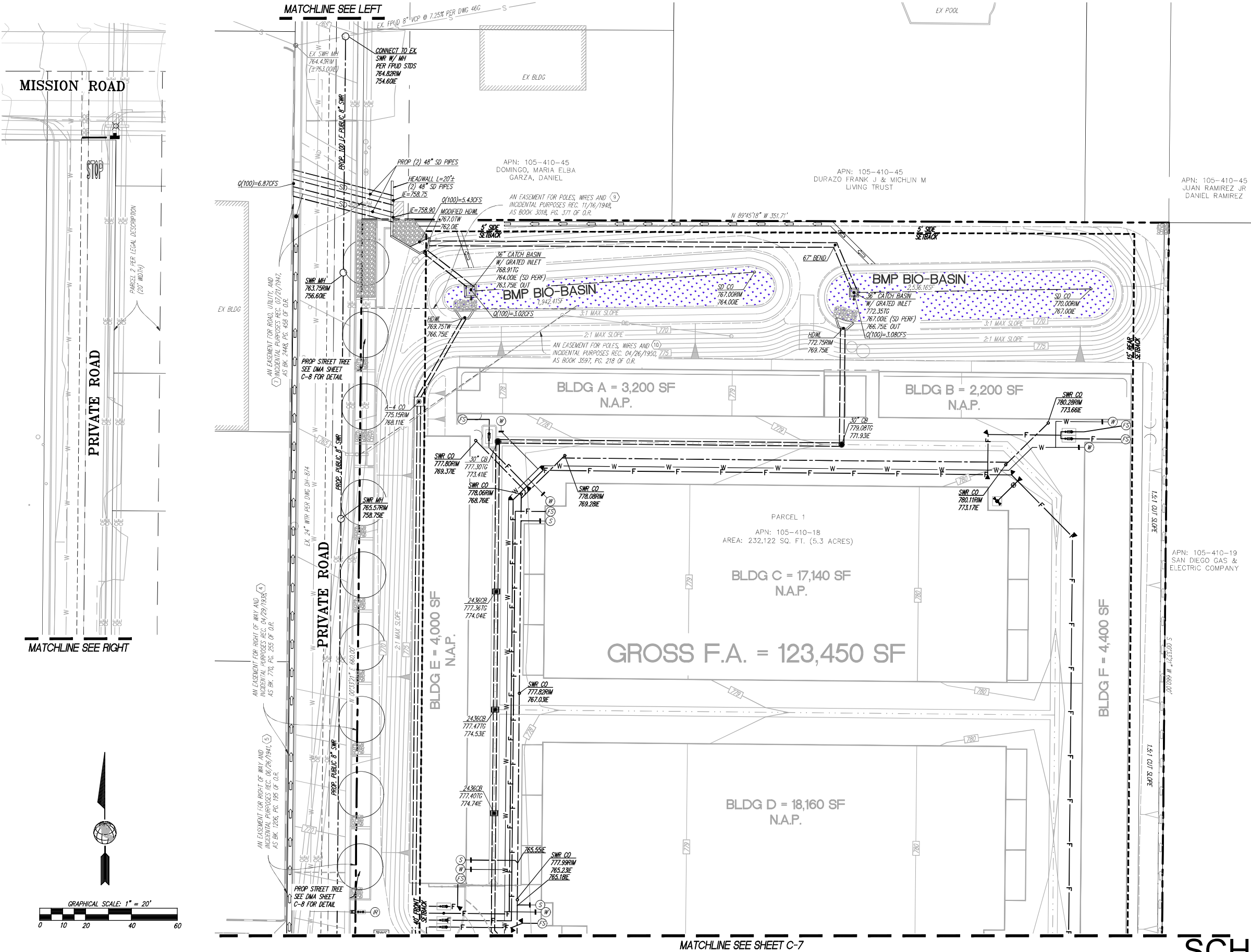
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MISSION ROAD SELF STORAGE
FALLBROOK, CA

SCHEME C
CONCEPTUAL GRADING PLAN

JOB NUMBER: 24-719
SCALE: N/A
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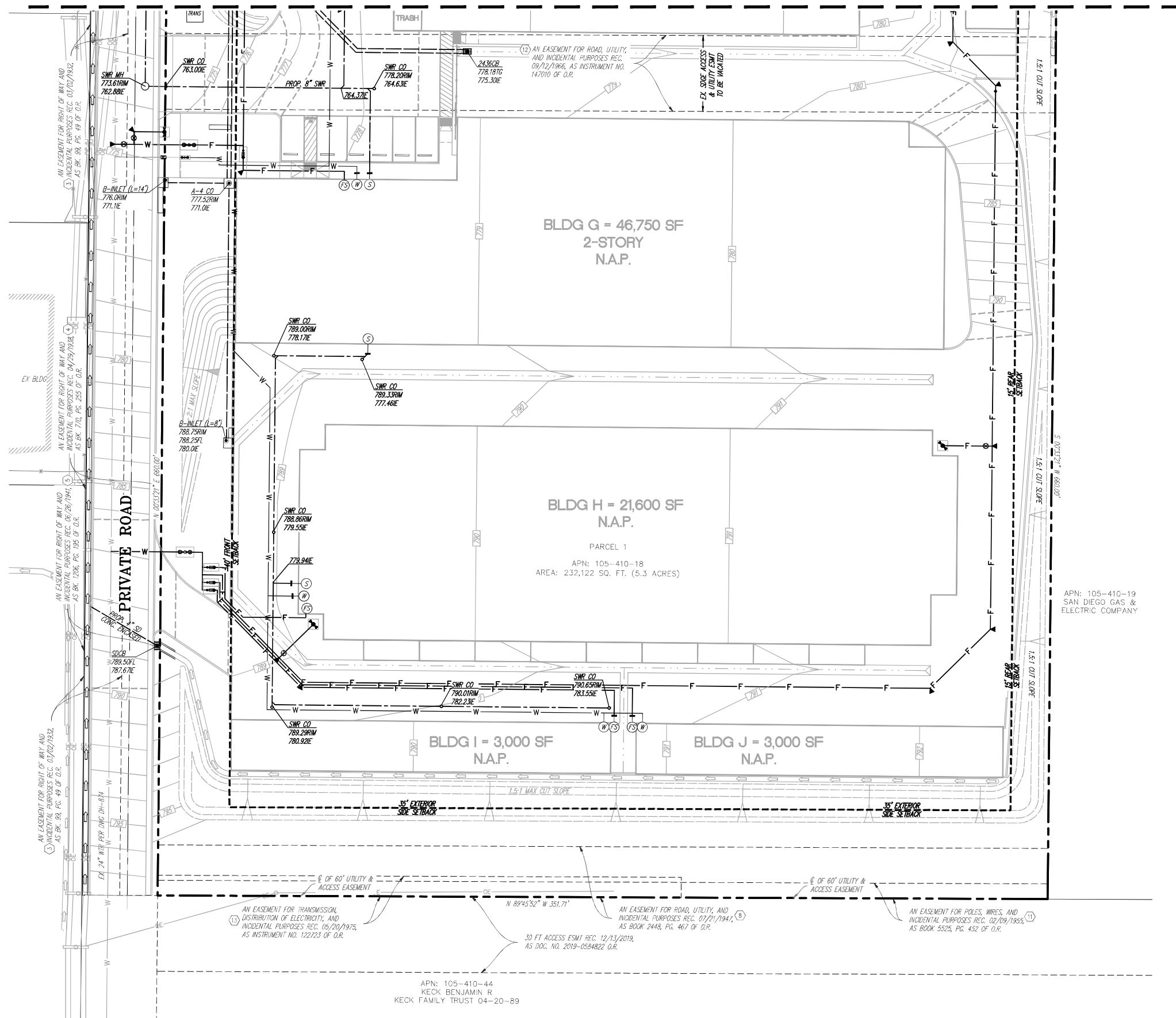
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MISSION ROAD SELF STORAGE FALLBROOK, CA

SCHEME C CONCEPTUAL UTILITY

JOB NUMBER: 24-719
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DATE: 07/29/2026

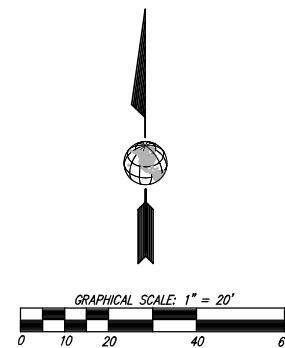
MATCHLINE SEE SHEET C-6



EASEMENT + EXCEPTIONS NOTES:

THE FOLLOWING IS A LIST OF ALL EASEMENTS, SERVITUDES, RIGHTS OF WAY, ACCESS, AND OTHER SURVEY RELATED DOCUMENTS THAT BURDEN THE SUBJECT PROPERTY WHICH ARE LISTED UNDER THE EXCEPTIONS FOR THE ABOVE REFERENCED PRELIMINARY REPORT. ITEMS THAT CAN BE PLOTTED ARE SHOWN HEREON.

- (8) INDICATES EXCEPTION ITEM IS PLOTTABLE AND SHOWN HEREON.
- (3) AN EASEMENT FOR RIGHT OF WAY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED MARCH 02, 1932 AS BOOK 99, PAGE 49 OF OFFICIAL RECORDS. SAID ITEM LIES OUTSIDE OF THE SUBJECT PROPERTY BUT IS SHOWN HEREON FOR INFORMATIONAL PURPOSES.
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MISSION ROAD SELF STORAGE FALLBROOK, CA

SCHEME C CONCEPTUAL UTILITY

JOB NUMBER: 24-719
SCALE: N/A
DATE: 07/29/2026

BMP-1 STAGE vs AREA			
BMP-1 BASIN AREA = 2450 SF			
BMP-1 TOTAL VOLUME = 7426 CF			
DEPTH (FT)	ELEVATIONS (FT)	AREA (SF)	NOTES
0-1.0	767.0-768.0	980	2450 SF X 0.40 (GRAVEL POROSITY)
1.0-2.75	768.0-769.75	490	2450 SF X 0.20 (SOIL POROSITY)
2.75	769.75	2450	FINISH GRADE ELEVATION
3.50	770.75	2850	SURFACE PONDING
4.50	771.75	3700	SURFACE PONDING
5.50	772.75	4605	SURFACE PONDING

BMP-2 STAGE vs AREA			
BMP-1 BASIN AREA = 1940 SF			
BMP-1 TOTAL VOLUME = 6766 CF			
DEPTH (FT)	ELEVATIONS (FT)	AREA (SF)	NOTES
0-1.0	764.0-765.0	776	2450 SF X 0.40 (GRAVEL POROSITY)
1.0-2.75	765.0-766.75	388	2450 SF X 0.20 (SOIL POROSITY)
2.75	766.75	1940	FINISH GRADE ELEVATION
3.50	767.75	2405	SURFACE PONDING
4.50	768.75	3370	SURFACE PONDING
5.50	769.75	4390	SURFACE PONDING

SITE DESIGN BMP - TREE WELL DATA TABLE							
TREE WELL #	TRIBUTARY BASIN	CANOPY DIAMETER	# OF TREES	AMENDED SOIL DEPTH	REQUIRED TREE WELL SOIL AREA (SF/TREE)	REQUIRED RETENTION VOLUME (CF)	TREE WELL VOLUME REDUCTION (CF/TREE)
TREE WELL-1	DMA-3	20 FT	8	2.5 FT	251 SF	1,375 CF	180 CF

GREEN STREET BMP DATA TABLE						
TREE WELL #	TRIBUTARY BASIN	CANOPY DIAMETER	# OF TREES	AMENDED SOIL DEPTH	REQUIRED TREE WELL SOIL AREA (SF/TREE)	TREE WELL VOLUME REDUCTION (CF/TREE)
GREEN STREET BMP TREE	DMA-4	20 FT	1	2.5 FT	251 SF	180

TREE WELL NOTE
THE AMENDED SOIL AREA FOR ALL TREES, (TREETWELLS AND GREENSTREET TREE) IS 8.35 FT WIDE BY 31.5 FT LONG

DMA DATA TABLE				
DMA-NO.	TOT. AREA (SF)	IMPERVIOUS (%)	DESIGN DCV (CF)	TYPE/TREATED BY
DMA-1	118,274	86	4,377	BMP-1
DMA-2	89,273	78	3,000	BMP-2
DMA-3	20,743	5	494	TREE WELL-1
DMA-4	3,318	100	139	GREEN STREET BMP TREE
DMA-5	18,730	0	0	SELF-MITIGATING
OFF-1	123,490	0	0	EXISTING AREA BYPASS

TREATMENT BMP DATA TABLE			
BMP#	TRIBUTARY DMA	PROPOSED FOOTPRINT (SF)	DESCRIPTION
BMP-1	DMA-1	2,450	FULLY LINED BIOFILTRATION BASIN W/ 2" LOW FLOW ORIFICE
BMP-2	DMA-2	1,940	FULLY LINED BIOFILTRATION BASIN W/ 1-1/2" LOW FLOW ORIFICE

BMP INSPECTION SCHEDULE NOTES
CONTRACTOR MUST CONTACT ENGINEER FOR INSPECTION OF BMPs AT THE FOLLOWING STAGES OF CONSTRUCTION:
-PRIOR TO START OF CONSTRUCTION OF BIOFILTRATION AREA
-PRIOR TO CONSTRUCTION OF OUTLET STRUCTURES
-AFTER GRADING OF THE BASIN AREA FOR CERTIFICATION
-AFTER PLACEMENT OF IMPERMEABLE LINER (W/ EXTRA LENGTH FOR EMBEDMENT)
-AFTER PLACEMENT OF SUB-DRAIN
-AFTER THE PLACEMENT OF GRAVEL DRAINAGE LAYER
-AFTER PLACEMENT OF TREATMENT SOIL
-AFTER IRRIGATION AND LANDSCAPING ACTIVITIES

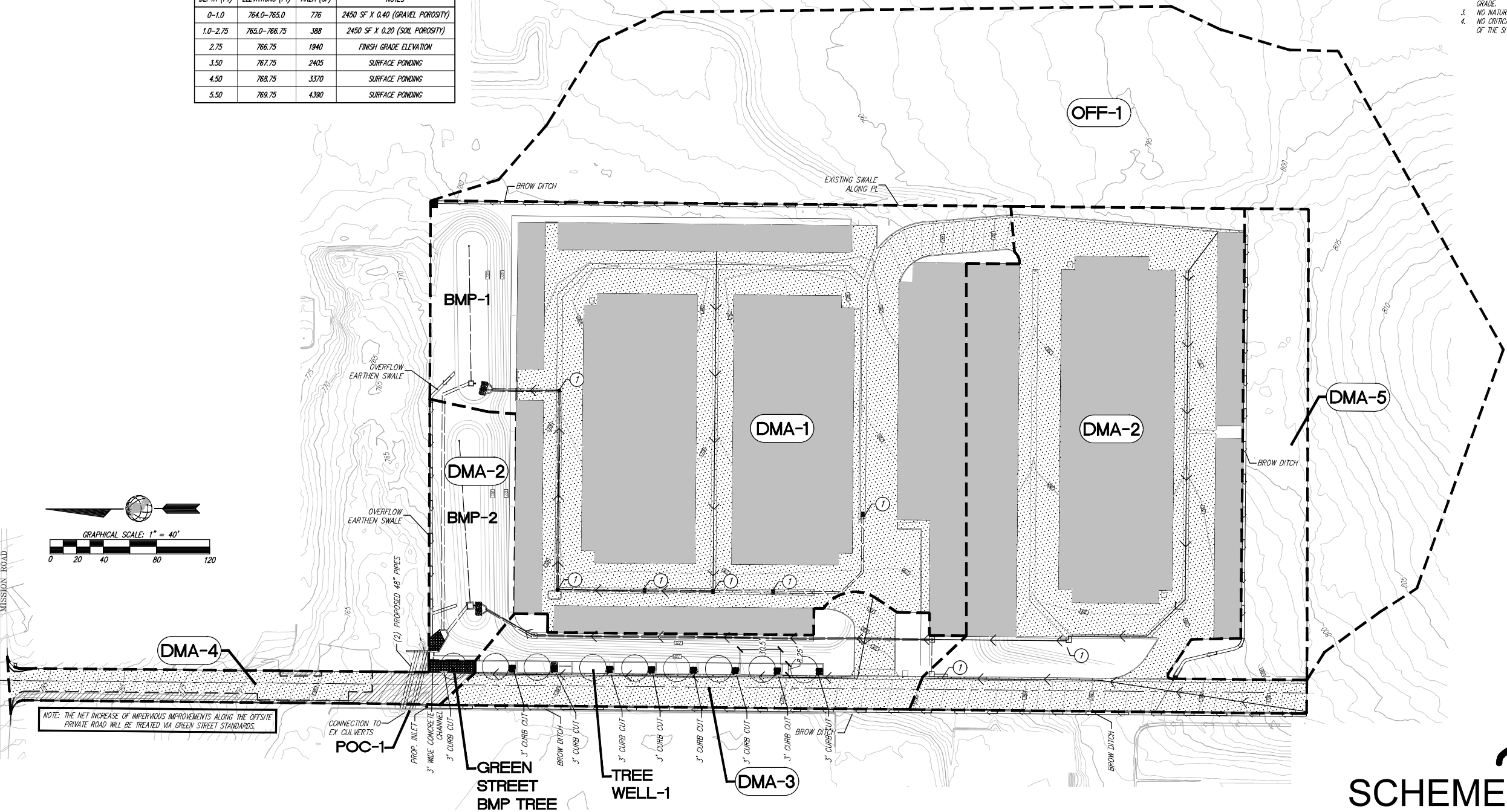
*SURVEY STAKES SHALL BE AVAILABLE FOR EACH AND EVERY INSPECTION

SITE DESIGN BMPs
THE FOLLOWING SITE DESIGN BMPs ARE TO BE UTILIZED FOR DESIGN:
1. SD-4 MINIMIZE SOIL COMPACTION AT ALL LANDSCAPE AREAS
2. SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES AT ALL LANDSCAPE LOCATIONS.

SOURCE CONTROL BMPs
STORM DRAIN STENCILING

LEGEND
DMA BOUNDARY: - - - - -
DRAINAGE MANAGEMENT AREA NO. DMA-#
BUILDING AREA: [Hatched Pattern]
IMPERVIOUS AREA: [Stippled Pattern]
NET INCREASE IMP. AREA OF OFFSITE IMPROVEMENTS: [Diagonal Lines]
PERVIOUS AREA: [White]
DRAINAGE ARROWS: [Arrow]
BEST MANAGEMENT PRACTICE: BMP-#

NOTES
1. UNDERLYING NRCS HYDROLOGIC SOIL GROUP FOR SITE IS TYPE D.
2. GROUNDWATER DEPTH WAS ENCOUNTERED AT APPROXIMATELY 12.5 FEET BELOW EXISTING GRADE.
3. NO NATURAL HYDROLOGIC FEATURES EXIST ON THE SITE
4. NO CRITICAL COARSE SEDIMENT YIELD AREAS EXISTING ON-SITE OR ARE LOCATED UP-STREAM OF THE SITE.



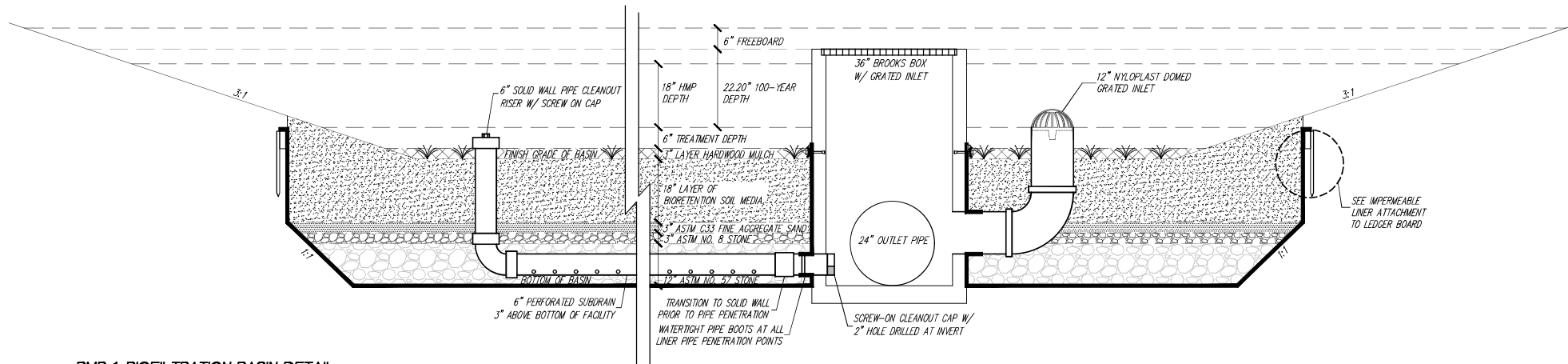
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SCHEME C DMA MAP

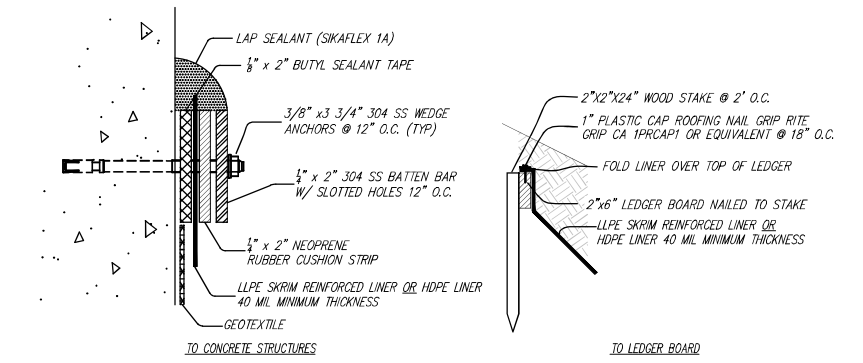
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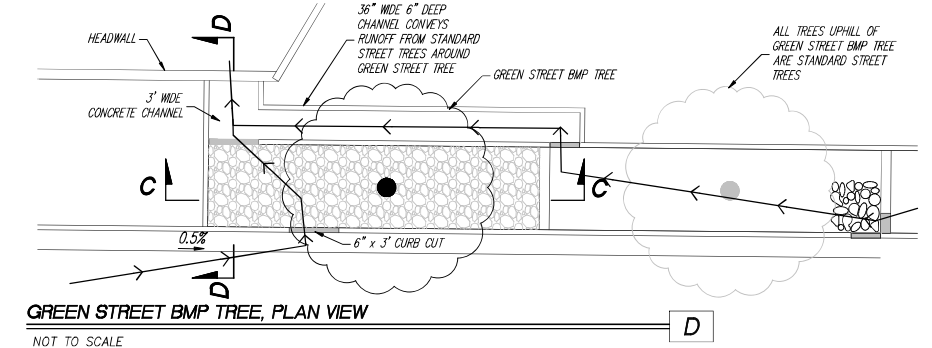
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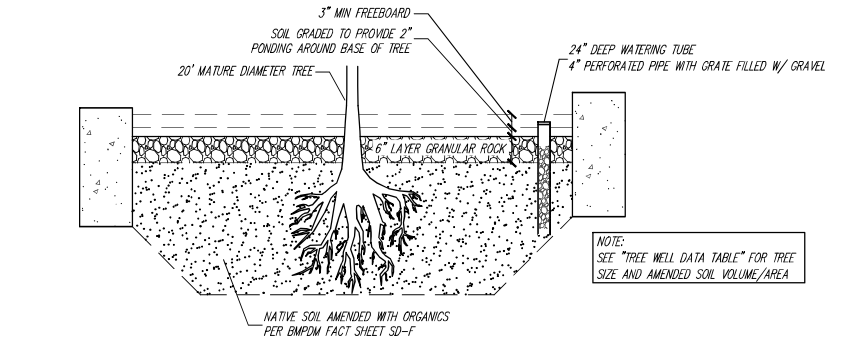
BMP-1, BIOFILTRATION BASIN DETAIL
NOT TO SCALE



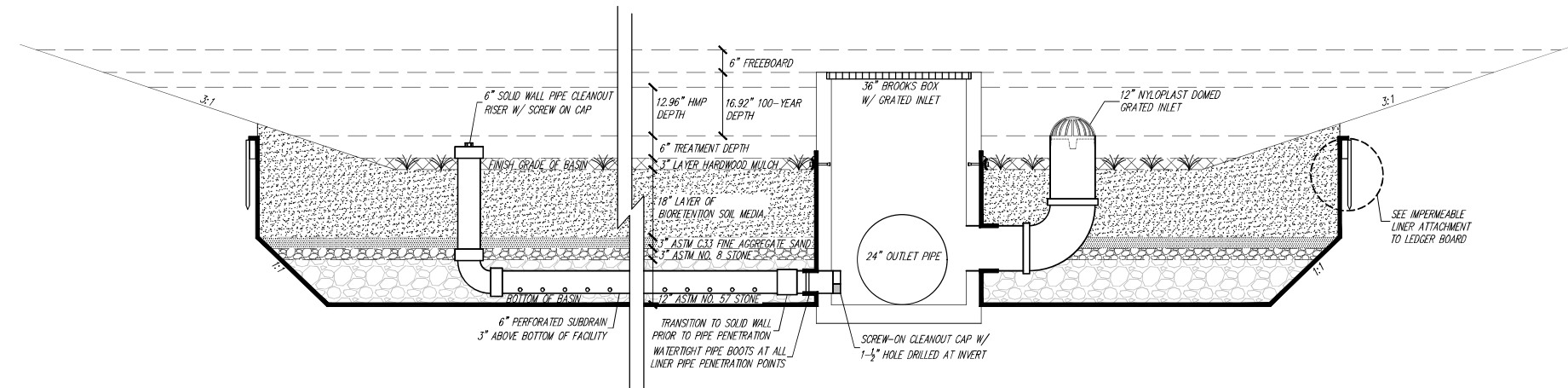
IMPERMEABLE LINER ATTACHMENT DETAIL
NOT TO SCALE



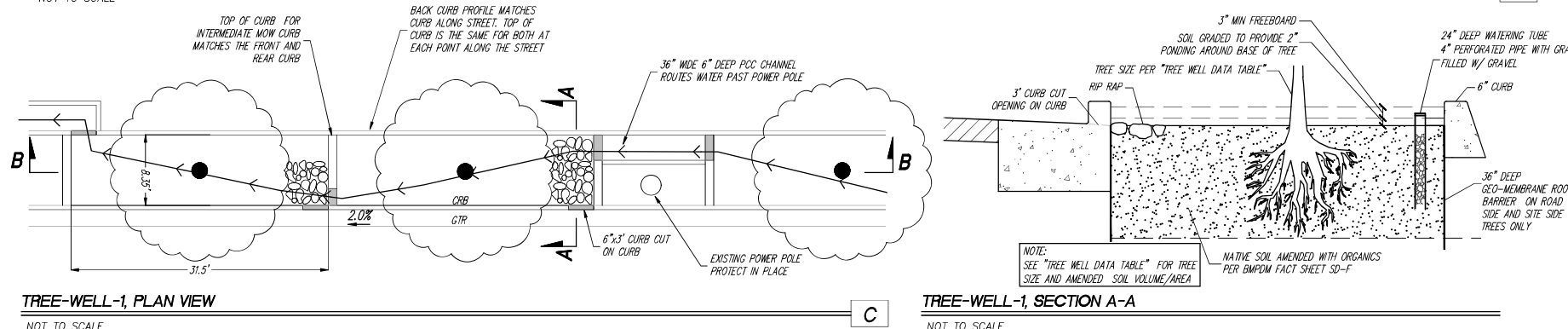
GREEN STREET BMP TREE, PLAN VIEW
NOT TO SCALE



GREEN STREET BMP TREE, SECTION C-C
NOT TO SCALE

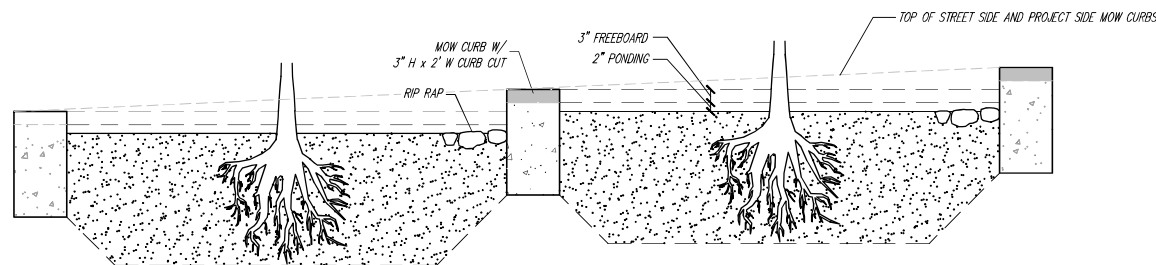


BMP-2, BIOFILTRATION BASIN DETAIL
NOT TO SCALE

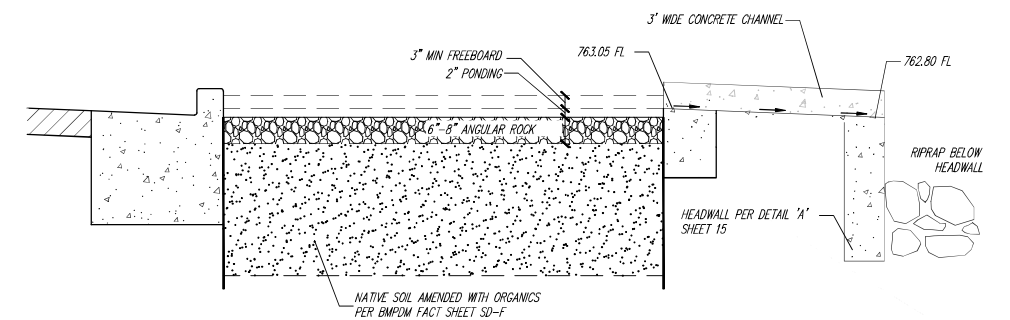


TREE-WELL-1, PLAN VIEW
NOT TO SCALE

TREE-WELL-1, SECTION A-A
NOT TO SCALE



TREE-WELL-1, SECTION B-B
NOT TO SCALE



GREEN STREET BMP TREE, SECTION D-D
NOT TO SCALE

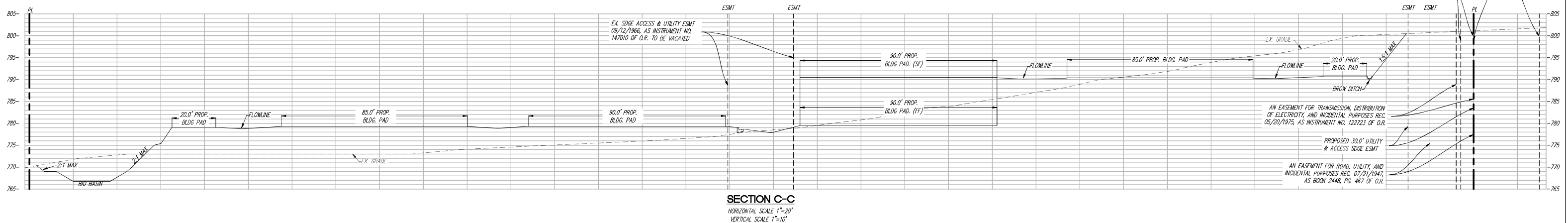
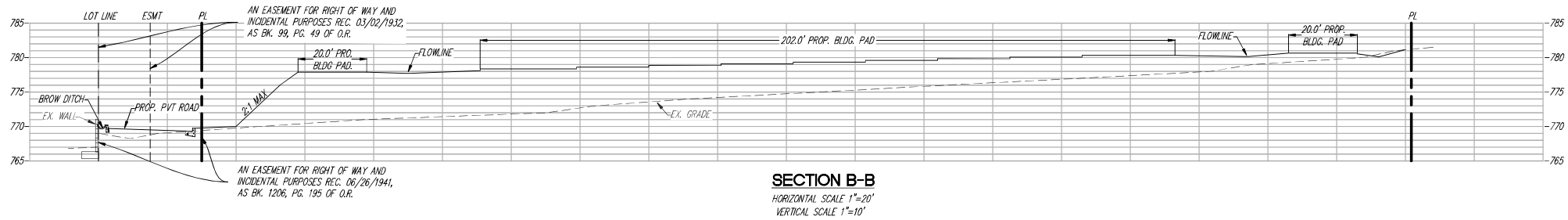
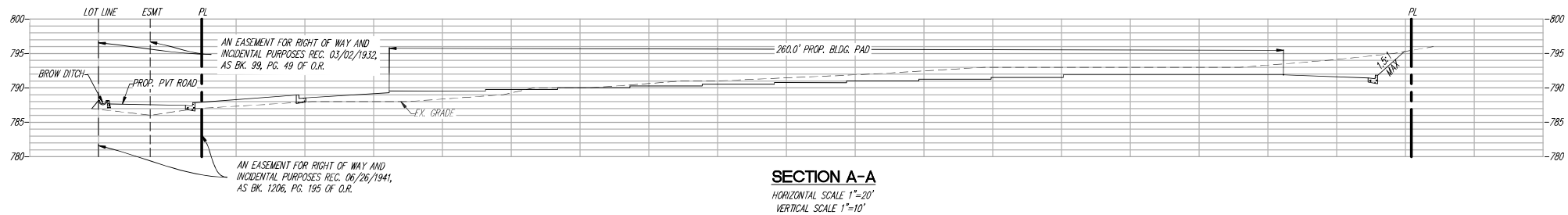
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SCHEME C BMP DETAILS

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SCHEME C
SECTIONS

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County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 5: Site and Drainage Description

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: Fallbrook Self Storage

Drainage Study Prepared By: Omega Engineering Consultants, Inc.

Date: 08/06/2026

- 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.

Fallbrook Self Storage Drainage Study

1305 East Mission Road

Fallbrook, CA 92028

APN: 105-410-18-00

Project # PDS2025-LDGRMJ-30561

Date Prepared:

August 07, 2026

Prepared for:

Andrew Bertha

Boulder Ridge Capital

3220 Grey Hawk Ct.

Carlsbad, California 92010

(760) 519-0566

andrew@boulderridgecapital.com

Prepared By:



4320 Viewridge Ave, Suite C

San Diego, CA 92113

Ph: (858) 634-8620

Declaration of Responsible Charge:

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

Patric de Boer

RCE 83583

Registration Expires

3-31-2027

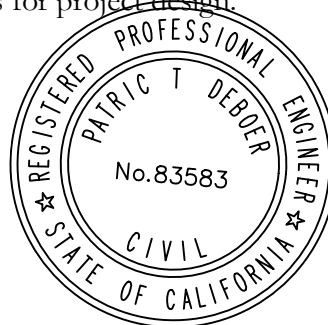


Table of Contents

Site & Project Description	1
Methodology	1-2
Existing Conditions	3
Proposed Conditions	3-4
Existing Rational Analysis.....	4-5
Proposed Rational Analysis	5-6
SWMM Analysis.....	6-7
Results and Conclusions.....	7-8
Site Vicinity Map	9
Existing Hydrology Exhibit	10
Proposed Hydrology Exhibit.....	11
Weighted “C” Values.....	12
Existing 100-year, 6-hour Rational Calculations	13
Proposed Unmitigated 100-year, 6-hour Rational Calculations	14
Proposed Mitigated 100-year, 6-hour Rational Calculations.....	15
Proposed 100-year, 6-hour Tt Calculations.....	16

Appendices

Soil Hydrologic Group Map	Appendix 1
100-yr 6-hr Storm Isopluvial Map	Appendix 2
100-yr 24-hr Storm Isopluvial Map.....	Appendix 3
Intensity-Duration Design Chart	Appendix 4
Runoff Coefficient Chart.....	Appendix 5
Maximum Overland Flow Length Chart.....	Appendix 6
Rational Formula-Overland Time of Flow Nomograph.....	Appendix 7
Time of Concentration Nomograph for Natural Watersheds.....	Appendix 8
Effective Slope for Natural Watersheds	Appendix 9
Hydraflow Express Exhibits	Appendix 10
SWMM Input File.....	Appendix 11
BMP Details.....	Appendix 12
Geotechnical Investigation Report.....	Appendix 13
USGS 7.5-minute Topo Exhibit.....	Appendix 14
Pipe and Ditch Sizing	Appendix 15
Offsite Tributary Area to Culvert Calculations.....	Appendix 16
Inlet Sizing	Appendix 17
Rip Rap Sizing	Appendix 18
Headwall Inlet Control – Culvert Sizing	Appendix 19

Site & Project Description

This drainage study has been prepared for the proposed commercial development for the vacant lot at 1305 East Mission Road in Fallbrook, CA 92028. The proposed improvements include several storage buildings, a driveway, two biofiltration basins, an onsite storm drain system, drive aisles, landscape, and hardscape. The site is approximately 300 feet south of State Route 13 and 3.5 miles west of Interstate 15. See Figure No. 1 for the Vicinity Map.

The project will involve grading the existing lot to construct several storage buildings, drive aisles, and two biofiltration basins. The total area of analysis is approximately 138.80 acres. This includes the proposed disturbed areas, portions of on-site area that is not disturbed, and portions of offsite area that drain to the site. The proposed lined biofiltration basins on the northern edge of the property will be utilized for 100-year attenuation and stormwater treatment purposes. The treatment properties of the biofiltration basins are detailed in a separate Stormwater Quality Report (SWQMP).

Methodology

This drainage report has been prepared in accordance with current County of San Diego regulations and procedures. The Modified Rational Method was used to determine the peak flowrates generated by the existing and proposed site conditions.

The soil type selected for the site is Soil Type D. This was corroborated by the infiltration rates provided by the Geotechnical Investigation prepared by Geocon Incorporated on June 5, 2024. The Geotechnical Investigation concluded the site is underlain by existing alluvium and granitic rocks which provided a very low average rate of 0.009 inches per hour (with a safety factor of 2). Even though the Web Soil Survey states that the site is underlain by Type B and C soils, we believe that based on the low infiltration rates, type D soil is more representative of the onsite soils. In addition, the infiltration rate of 0.009 inches per hour is more representative of Type D soils per the County of San Diego BMP Design Manual, Table B.2-3. The web soil survey will be included on Appendix 1 along with the excerpt of the BMP Design Manual.

A SWMM model was generated to demonstrate that the proposed basins will attenuate the 100-year storm. Rick RatHydro, a hydrograph-generating program, uses the input and output data determined in the Rational Method calculations and produces a hydrograph time series with a matching peak flowrate. Rick RatHydro was used to produce two hydrographs. The hydrographs were then input manually into EPA SWMM 5.1 as a time series.

The proposed storm drain pipes and channels were sized following the County of San Diego Hydraulic Design Manual. Please refer to Appendix 15 of this report.

The Nyloplast grated inlets were sized using manufacturer provided rating curves that provide capacity vs. head values. The 50% clogging factor was included by doubling the tributary Q and obtaining a head value over the grate. The B-inlets were sized by modeling the inlets using Hydraflow Express. Please refer to Appendix 17 of this report for exhibits.

The rip rap pads with tributary velocities greater than 5 fps have been sized per the Hydraulic Engineering Circular No. 14 provided by the U.S. Department of Transportation Federal Highway Administration. Please refer to Appendix 18 of this report for exhibits.

The C-value of each basin was determined by taking the area-weighted average of the values of 0.35 for natural D-type soil and of 0.90 for impervious surfaces (please see Table 3-1 of the County Hydrology Manual, included as Appendix 5 of this report). The weighted C-value calculations are provided on the Existing and Proposed Rational Calculations.

The initial time of concentration (Ti) and maximum overland flow length (Lm) were determined using Table 3-2 of the Hydrology Manual included as Appendix 6 on this report. Ti values were selected based off the slope and associated NRSC element and imperviousness of each basin. The 100-yr, 6-hr storm depth (P6) was determined using the isopluvial map included as Appendix 2 on this report. The 100-yr, 24-hr storm depth (P24) was determined using the isopluvial map included as Appendix 3 on this report.

The effective slope has been determined using Figure 3-5 of the Hydrology Manual included as Appendix 9 on this report.

The total time of concentration was determined by adding the Ti value to the travel time (Tt). Tt for overland flow on impervious surfaces was determined by modeling an asphalt swale or gutter using Hydraflow Express to determine the velocity. Then the length of flow was divided by the flow velocity to determine Tt (See Appendix 11 in this report). The Tt in natural watersheds was determined by using the Kirpich nomograph in Figure 3-4 of the San Diego County Hydrology Manual, included in Appendix 8 in this report. The calculation of the Tt has only been analyzed for the surface flow, not the pipe flow. This results in a more simplified version of the calcs while also providing smaller Tc's. Smaller Tc's result in greater intensities which result in higher Q's. This method provides more conservative results as compared to the nodal process.

$$T_t = \left(\frac{11.9L^3}{E} \right)^{0.385} \quad (\text{Natural Watersheds})$$

$$T_t = \frac{L}{V * \left(60 \frac{\text{sec}}{\text{min}} \right)} \quad (\text{Gutter Velocity})$$

$$T_c = T_i + T_t$$

The Tc and the P6 values were entered into the peak intensity formula from page 3-7 of the hydrology manual to determine the intensity of the rainfall during the peak of the 100-year, 6-hr storm.

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

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

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

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

- (1) County of San Diego Hydrology Manual, 2003
- (2) Modern Sewer Design, American Iron & Steel Institute, 1st Ed., 1980

Existing Conditions

The existing site is a vacant dirt lot with trees and shrubs on the north, west, and southeast edges of the lot and shrubs across the center of the site. The site accepts runoff from an offsite areas from the south and north of the site via overland flow. There is a well-defined swale along the easterly property line that prevents run-on from the easterly neighboring property.

In the existing conditions, the northern edge of the site drains to the natural small creek immediately north of the site, which connects to the existing storm drain pipes northwest of the project site. This connection is referred to as Discharge Point #1 in this report.

Most of the site - being the central portion of the site - drains via overland flow to northwesterly corner of the property. This portion of the site accepts run-on from the southerly offsite area. The offsite area is a vacant lot with no improvements just south of the project site; this offsite area drains via overland flow to the southernly edge of the site. This central portion of the project site flows to the northwesterly corner of the site, which drains to the existing connection storm drains immediately northwest of the site, being Discharge Point #1.

The northerly offsite area consists of an existing paved road, driveways and portions of landscape areas from the existing single-family house residences to the north of the site. The runoff generated from this offsite area will drain to Discharge Point # 1 where it conflues with the onsite flows.

Proposed Conditions

In the proposed conditions, the northern half of the developed site will drain via rain gutters and surface flow, in a northerly direction to the northeasterly biofiltration basin (BMP-1). The biofiltration basin will have sufficient ponding depth to attenuate the 100-year storm; from the basin, stormwater will drain to the existing storm drain pipes immediately northwest of the project site. This point is referred to as Discharge Point #1 in this report.

The southern half of the developed site will drain via rain gutters and surface flow to a pipe along the central westerly edge of the project site, which will carry the flow from the southern half of the site in a northerly direction to the northwesterly biofiltration basin (BMP-2). The biofiltration basin will have sufficient ponding depth to attenuate the 100-year storm; from the basin, stormwater will flow via an emergency weir to an overflow pipe to the existing storm drain pipes immediately northwest of the project site, being Discharge Point #1.

A brow ditch is proposed around the edges of proposed developed area of the project site, which will collect the offsite run-on from the vacant lot south of the project site and to replace the existing swale along the easterly edge of the project site to redirect any run on from the adjacent SDG&E substation around the project site to the northwestern corner of the site, where it will connect to the proposed (2)-48" culverts immediately northwest, being Discharge Point #1.

The northerly offsite area will drain via overland flow to a proposed inlet on the private road that drains directly to the (2)-48" culvert pipes.

In order to determine the capacity of the proposed 2-48" culverts, we had to calculate the tributary offsite area to them. We used Streamstats to determine the approximate offsite area that drains

towards the area. We then used the Rational Method to calculate the tributary Q. By using the Manning's equation, we have determined that a single 48" pipe has the capacity of 118 cfs (See Appendix 16). The 2-48" pipes will have enough capacity for the total expected offsite flow along with the onsite unmitigated flow.

The two biofiltration basins will follow the flood control and stormwater BMP's conjunctive use criteria (See image below). The proposed biofiltration basins will meet the pollutant control, hydromodification control and flood control (100-year) within the basin layers. The flood control storage volume overlaps the portion of hydromodification control storage volume that is above the lowest above ground outlet. Refer to the following website for guidance on the conjunctive use requirements:

https://www.sandiegocounty.gov/content/dam/sdc/dpw/FLOOD_CONTROL/floodcontroldocuments/Conjunctive%20use%20facilities%20handout.pdf

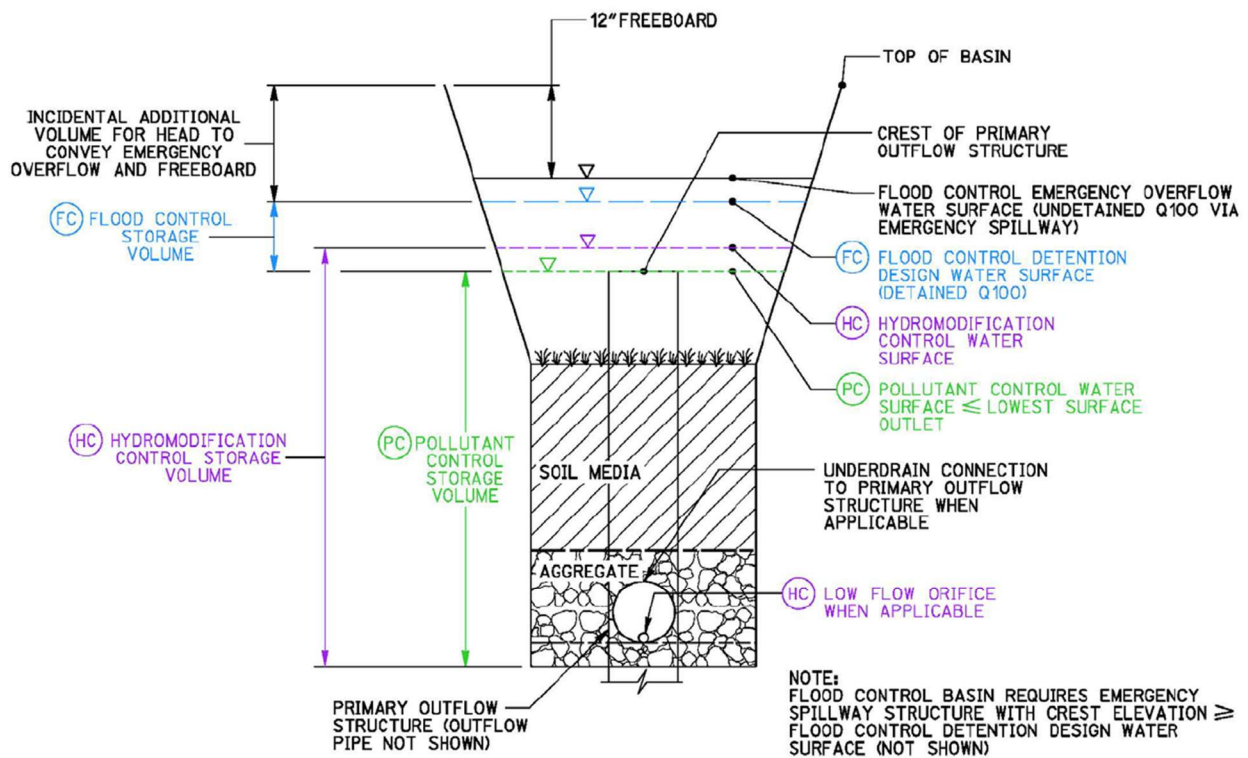


Figure 2
Conjunctive Use Facility for Storm Water Management and Flood Control:
Pollutant Control, Hydromodification Control, and Flood Control Detention; No Mid-flow Outlet

Existing Rational Analysis

The site and the portion of offsite area just south of the site were modeled as two drainage basins in the existing conditions. The existing basins are referred to as E-1 and O-2 in this report. The average slopes of the existing basins vary between 6.1% and 10.7%.

Below is a summary of the input data and resulting flowrates generated by each basin for the 100-year, 6-hr storm.

Existing Rational Calculation Summary

Basin	Area (ac)	Impervious %	C	T _C (mins)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)
E-1	6.43	0%	0.35	10.50	4.57	10.29
O-2	0.57	47%	0.61	7.83	5.52	1.92
O-3	13.80	-	0.49	28.97	2.38	153.42

Below is a summary of the existing confluence flow calculations.

Confluence Pt.	Tributary Flows	T _C (mins)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	Confluence Flow (cfs)
CP-1	E-1	10.50	4.57	10.29	11.88
	O-2	7.83	5.52	1.92	
DP-1	CP-1	10.50	4.57	11.88	159.59
	O-3	28.97	2.38	153.42	

The peak runoff flowrate discharged by the site is 159.59 cfs at Discharge Point #1.

Proposed Rational Analysis

The proposed site was modeled as six drainage basins. The proposed basins are referred to as P-1, P-2, P-3, O-1, O-2 and O-3 in this report. The average slopes of the basins vary between 1.0% and 10.7%.

Below is a summary of the input data and resulting flowrates generated by each basin for the 100-year, 6-hr storm.

Proposed Rational Calculation Summary

Basin	Area (ac)	Impervious %	C	T _C (mins)	I ₁₀₀ (in/hr)	Q ₁₀₀ (Unmitigated) (cfs)	Q ₁₀₀ (Mitigated) (cfs)
P-1	2.73	86%	0.82	5.00	7.38	16.56	3.04
P-2	2.09	78%	0.78	5.30	7.11	11.60	2.73
P-3	0.48	51%	0.63	5.00	7.38	2.21	-
O-1	1.11	0%	0.35	9.80	4.78	1.85	-
O-2	0.61	44%	0.59	7.83	5.52	2.04	-
O-3	131.80	-	0.49	28.97	2.38	153.42	-

Below is a summary of the proposed confluence flow calculations.

Confluence Pt.	Tributary Flows	T _c (mins)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	Confluence Flow (cfs)
CP-1	P-1	5.00	7.38	3.04	5.66
	P-2	5.30	7.11	2.73	
CP-2	CP-1	5.30	7.11	5.66	7.79
	P-3	5.00	7.11	2.21	
CP-3	CP-2	5.30	7.11	7.79	8.79
	O-1	9.80	4.78	1.85	
CP-4	CP-3	5.30	7.11	8.79	10.16
	O-2	7.83	5.52	2.04	
DP-1	CP-4	5.30	7.11	10.16	156.82
	O-3	28.97	2.38	153.42	

The peak runoff flowrate discharged by the site is 156.82 cfs at Discharge Point # 1. This demonstrates a decrease of 2.77 cfs. This is due to the attenuation properties of the proposed biofiltration basins.

SWMM Analysis

The 100-year peak flowrate for the project is attenuated by two proposed lined biofiltration basins (please see the BMP details in Appendix 12).

To model the 100-year flowrate generated from Basins P-1 and P-2, hydrographs were required. Rick RatHydro, a hydrograph generating program, was used to produce a hydrograph for each of the tributary basins based on the peak inflows. Please see Appendix 11 for the RatHydro values generated.

The hydrographs generated by Rick RatHydro was input manually into SWMM 5.1 as a time series. The hydrograph was then routed through an orifice link which discharges to the outfall node, DP-1.

The 12" Nyloplast domed grated inlets are modeled as orifice links based upon the capacity and head values provided by Nyloplast; the inlets drain to the project's outfall. The two-outlet links that discharge to DP-1 each represent a 12" Nyloplast Dome Grate riser at 0' offset. This is at the ponding treatment depth elevation within the biofiltration basins.

The storage unit curve within SWMM represents the surface storage of the basins starting at the elevation of the outlet links. This only counts the surface storage that is above the treatment depth. The area at each depth was determined by analyzing the contours within each basin. The proposed volume was determined using the SWMM analysis.

Storage Curve Editor

Curve Name
BMP-1

Description

	Depth (ft)	Area (ft2)
1	0	2850
2	1	3700
3	2	4605

Storage Curve Editor

Curve Name
BMP-2

Description

	Depth (ft)	Area (ft2)
1	0	2405
2	1	3370
3	2	4390

The max ponding depths above the treatment ponding depths of the facilities are 22.20 inches (BMP-1) and 16.92 inches (BMP-2). In the event of clogging, the stormwater will bypass via the precast box grated inlet and will drain to the outlet pipe. During normal operation of the facility, the water level is not anticipated to ever rise high enough to flow through the precast box grated inlet. The precast boxes will provide a pathway if the Nyloplast grated inlets are clogged. The outlet pipes within the precast box have been sized to have enough capacity to drain the unmitigated flow from the basins. In the event that the grated inlet and/or outlets pipes get clogged, a non-erosive overflow spillway has been added to both basins. The spillways will drain to an earthen swale that will route the flow to the rip rap just downstream of the basins.

The peak mitigated outflow for P-1 is 3.04 cfs versus the peak inflow of 16.56 cfs. This is a reduction of 13.52 cfs for the peak flow exiting the node versus entering. The peak mitigated outflow for P-2 is 2.73 cfs versus the peak inflow of 11.60 cfs, which is a reduction of 8.87 cfs.

The attenuated flow values were entered back into the Rational Method Calculation worksheets and confluence to determine the total mitigated peak discharge rate produced by the onsite and offsite basins to Discharge Point #1.

Results and Conclusions

The development of the project site will modify the onsite drainage patterns, but the discharge points locations will remain unchanged. The alterations on the onsite drainage patterns will not result on erosion or flooding. The proposed improvements result in a decrease in peak flowrates at Discharge Point #1 for the 6-hour, 100-year storm due to the attenuation properties of the proposed biofiltration basins.

	Area (ac)	C (ave)	T _c (mins)	I ₁₀₀ (in/hr)	V ₁₀₀ (fps)	Q ₁₀₀ (cfs)
Existing Conditions	138.80	0.48	28.97	2.38	9.57	159.59
Proposed Conditions	138.80	0.64	28.97	2.38		156.82

The project will not place any structures in the 100-year flood hazard areas or flood plain. The project is not located in an area that is exposed to the risk of flooding due to a dam levee failure, thus the

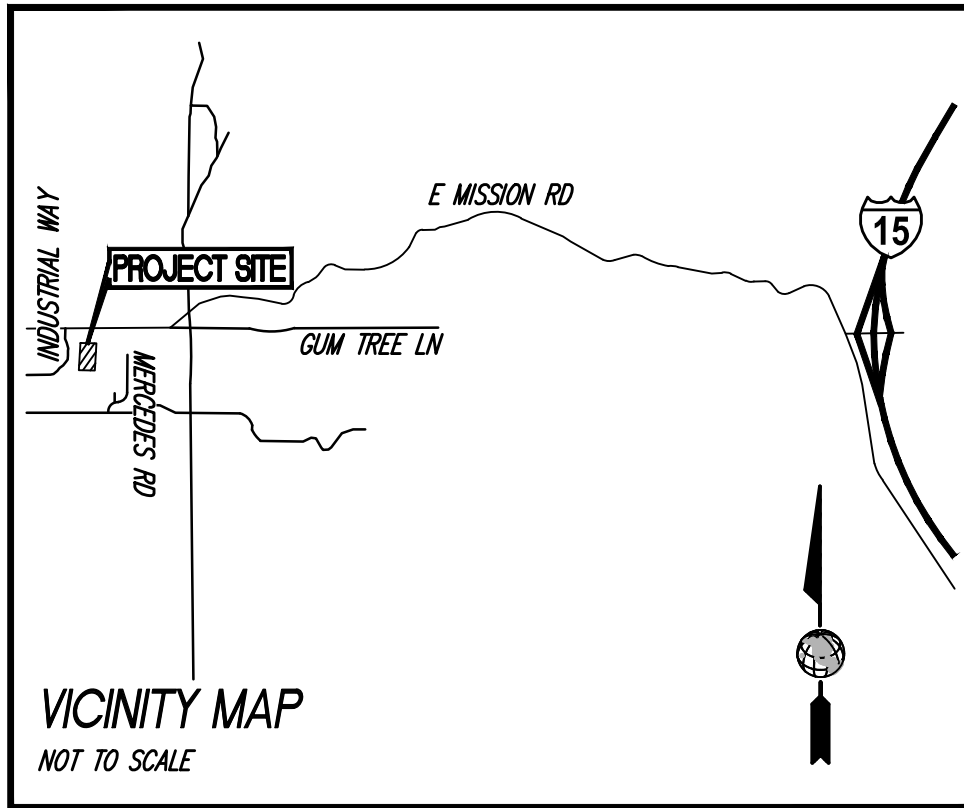
project will not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of a failure of a levee or a dam.

The project is not anticipated to exceed the capacity of the proposed onsite conveyances, as well as the existing offsite storm drain system conveyances. It is the opinion of Omega Engineering Consultants that the project will not cause adverse effects to downstream waterways and conveyances during the 100-year, 6-hour storm.

Project does not propose to discharge fill or dredged materials to the Waters of the State and will not involve construction near or over waters of the state, therefore no CWA 401 or 404 permit is required.

Based on the Temecula Quadrangle 7.5-minute Topo retrieved from the U.S. Department of Interior U.S. Geological Survey (USGS) (See Appendix 14), the location where the project is discharging to is not labelled as a blue line stream. The project will not disturb densely vegetated portions. Therefore, the project does not require 401/404 or 1602 permits.

It is the opinion of Omega Engineering Consultants that a drainage waiver and/or release letter is not required from any downstream property owners.



LEGEND

BASIN NUMBER

AREA LIMITS

DRAINAGE FLOW PATH

BUILDING AREA

PAVEMENT AREA

PERVIOUS AREA

E-#

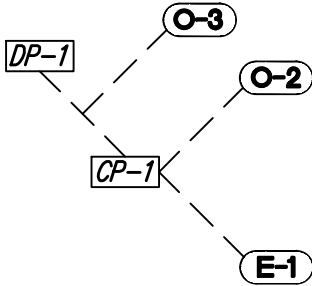
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DRAINAGE BASIN DATA											
BASIN #	AREA (AC)	C	H (FT)	L (FT)	S _{INITIAL} (%)	S _{AVG} (%)	T _i (MINS)	T _t (MINS)	T _c (MINS)	i ₁₀₀ (IN/HR)	Q ₁₀₀ (CFS)
E-1	6.43	0.35	52.0	855	8.0%	6.1%	6.90	3.60	10.50	4.57	10.29
O-2	0.57	0.61	32.0	300	10.0%	10.7%	6.90	0.93	7.83	5.52	1.92
O-3	131.80	0.49	56.0	3528	2.0%	1.6%	8.80	20.17	28.97	2.38	153.42

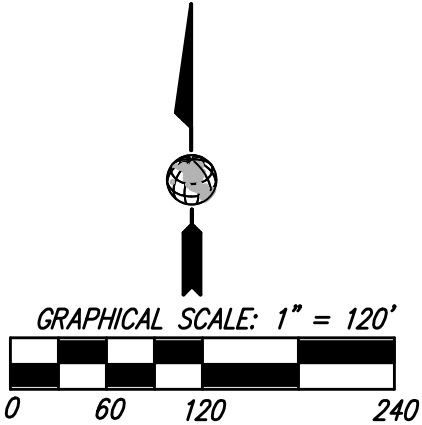
DISCHARGE POINT # 1
Q₁₀₀ = 159.59 CFS
V₁₀₀ = 9.57 FPS

REFER TO APPENDIX 16 FOR
OFFSITE BASIN O-3 CALCULATIONS

EX. DITCH
ALONG PL

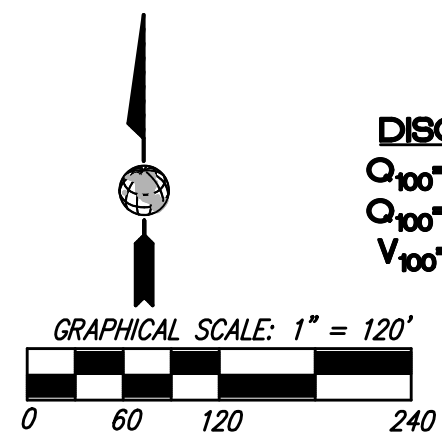


CONFLUENCE SCHEMATIC



FALLBROOK SELF STORAGE
EXISTING HYDROLOGY EXHIBIT





DISCHARGE POINT # 1
Q₁₀₀= 164.13 CFS (UNMITIGATED)
Q₁₀₀= 156.82 CFS (MITIGATED)
V₁₀₀= 9.63 FPS

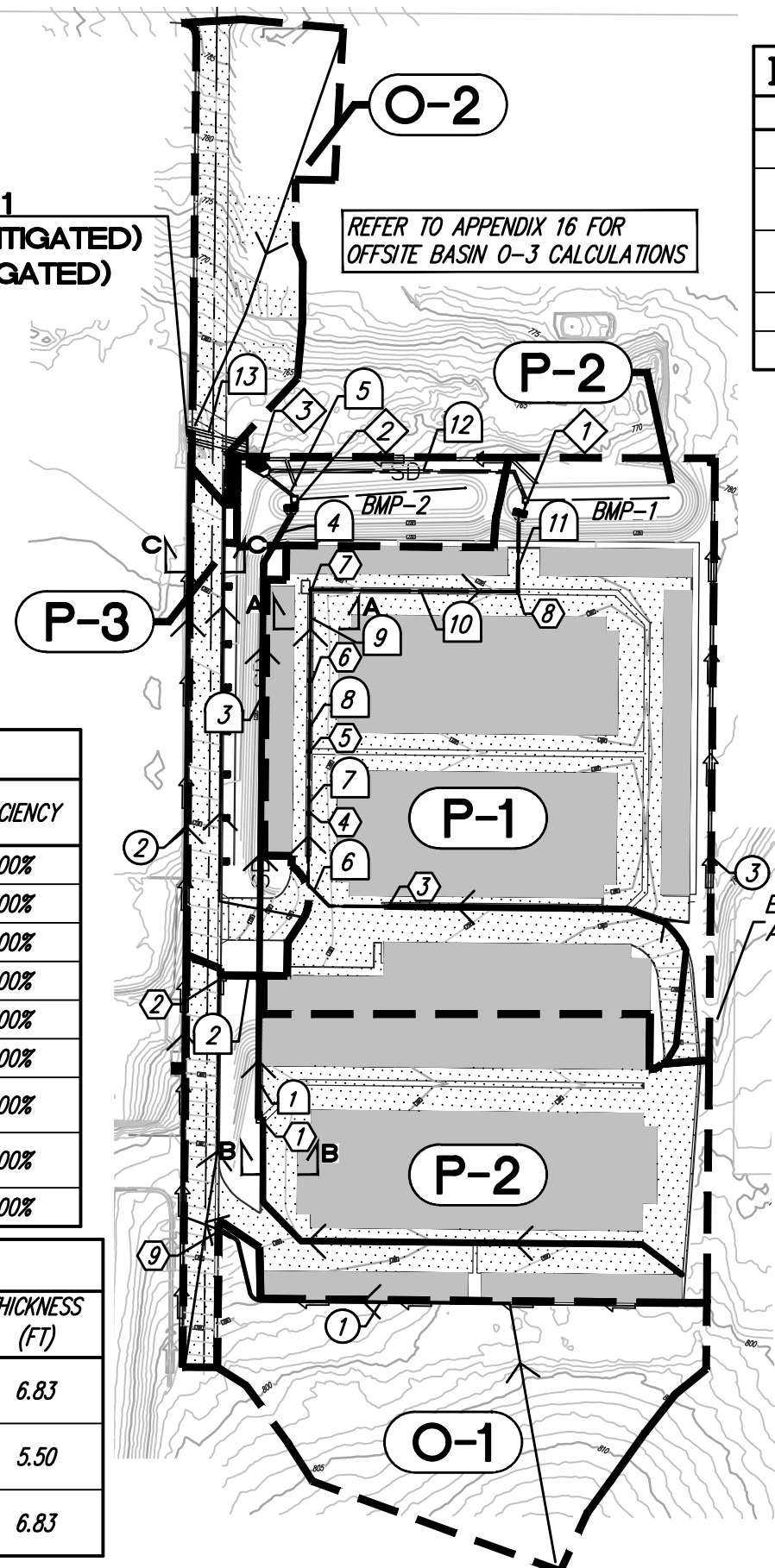
REFER TO APPENDIX 16 FOR
OFFSITE BASIN 0-3 CALCULATIONS

DITCH DATA					
DITCH #	TOP WIDTH (INCHES)	SLOPE (%)	D/T	V ₁₀₀ (FPS)	Q ₁₀₀ (CFS)
1	24	10.0	0.11	9.84	1.85
2	24	5.0	0.13	7.71	1.85
3	24	2.0	0.36	9.15	9.32

INLET DATA TABLE			
INLET #	DESCRIPTION	DEPTH (FT)	EFFICIENCY
1	B-INLET W/ 4" H X 8' W OPENING	0.66	100%
2	B-INLET W/ 4" H X 14' W OPENING	0.27	100%
3	2' X 3' NYLOPLAST GRATED INLET	0.43	100%
4	2' X 3' NYLOPLAST GRATED INLET	0.11	100%
5	2' X 3' NYLOPLAST GRATED INLET	0.42	100%
6	2' X 3' NYLOPLAST GRATED INLET	0.12	100%
7	30" NYLOPLAST STANDARD GRATED INLET	0.35	100%
8	30" NYLOPLAST STANDARD GRATED INLET	0.32	100%
9	2' X 3' NYLOPLAST GRATED INLET	0.21	100%

RIP RAP DATA TABLE						
RIP RAP #	RIP RAP TYPE	Q ₁₀₀ (CFS)	V ₁₀₀ (FPS)	LENGTH (FT)	WIDTH (FT)	THICKNESS (FT)
1	NO. 2 BACKING	16.56	14.59	8.00	1.65	6.83
2	NO. 2 BACKING	11.60	12.19	6.00	1.65	5.50
3	NO. 2 BACKING	27.55	12.19	8.00	1.65	6.83

SEE APPENDIX 10 FOR CHANNEL
ANALYSIS OF DRIVE AISLES A, B & C



BASIN CHARACTERISTICS		
	BMP-1	BMP-2
FG AREA (SF)	2,450	1,940
FG ELEVATION (FT)	769.75	766.75
TOP SLOPE ELEVATION (FT)	772.85	769.41
HEIGHT (FT)	3.10	2.66
VOLUME (CF)	7,426	6,766

DRAINAGE BASIN DATA												
BASIN #	AREA (AC)	C	H (FT)	L (FT)	S _{INITIAL} (%)	S _{AVG} (%)	T _i (MINS)	T _t (MINS)	T _c (MINS)	I ₁₀₀ (IN/HR)	Q ₁₀₀ UNMITIGATED (CFS)	Q ₁₀₀ MITIGATED (CFS)
P-1	2.73	0.82	13.3	310	12.5%	4.3%	2.40	0.99	5.00	7.38	16.56	3.04
P-2	2.09	0.78	3.3	380	1.0%	0.9%	4.10	1.20	5.30	7.11	11.60	2.73
P-3	0.48	0.63	13.2	350	4.7%	3.8%	2.90	1.65	5.00	7.38	2.21	-
O-1	1.11	0.35	49.5	970	8.0%	5.1%	6.90	2.90	9.80	4.78	1.85	-
O-2	0.61	0.59	32.0	300	10.0%	10.7%	6.90	0.93	7.83	5.52	2.04	-
O-3	131.80	0.49	56.0	3528	2.0%	1.6%	8.80	20.17	28.97	2.38	153.42	-

LEGEND

BASIN NUMBER

P-#

AREA LIMITS

DRAINAGE FLOW PATH

→

BUILDING AREA

[Solid Grey Box]

PAVEMENT AREA

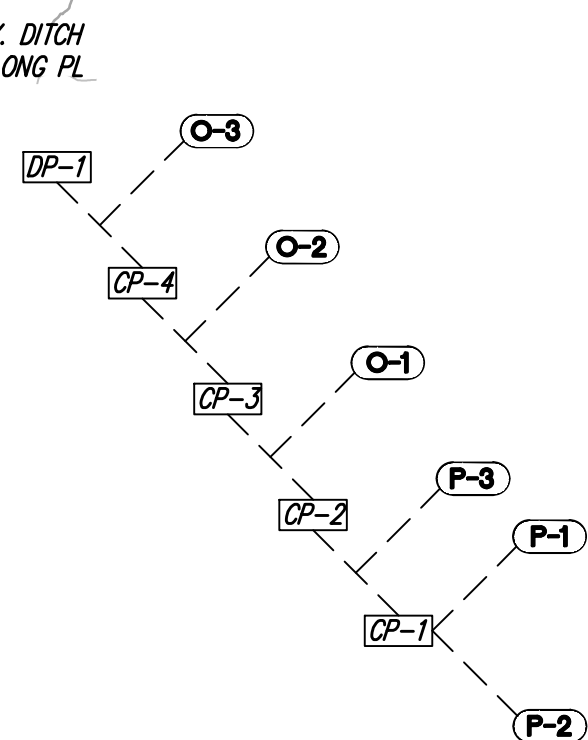
[Dotted Grey Box]

PERVIOUS AREA

[White Box]

PIPE DATA					
PIPE #	DIAMETER (INCHES)	SLOPE (%)	DEPTH/DIA	V ₁₀₀ (FPS)	Q ₁₀₀ (CFS)
1	12	8.7	0.61	15.79	7.93
2	12	0.5	0.59	3.78	1.82
3	18	1.0	0.83	7.40	11.60
4	18	3.4	0.53	12.19	11.60
5	24	7.0	0.28	16.11	11.60
6	18	0.5	0.60	4.92	5.45
7	18	0.5	0.65	5.10	6.19
8	18	1.0	0.81	7.42	11.36
9	18	1.0	0.84	7.45	11.80
10	18	1.0	0.39	7.28	12.09
11	24	4.3	0.46	14.59	16.56
12	24	2.4	0.64	11.74	16.56
13	48	0.5	0.62	9.66	82.07

*NOTE: THE MAX UNMITIGATED TRIB. OFFSITE FLOW TO PIPE # 13 WAS CALCULATED TO BE 164.60 CFS. SEE APPENDIX 16 FOR CALCULATIONS.



**FALLBROOK SELF STORAGE
PROPOSED HYDROLOGY EXHIBIT**



HYDROLOGY AND HYDRAULICS CALCS (Table No. 1)

BASIN	AREA (SF)	AREA (AC)	% Imp	"C" Value
E-1	280,093	6.43	0%	0.35
O-2	24,960	0.57	47%	0.61
O-3	5,741,223	131.80	-	0.49
EX TOTAL	6,046,276	138.80		
P-1	118,724	2.73	86%	0.82
P-2	90,926	2.09	78%	0.78
P-3	20,743	0.51	51%	0.63
O-1	48,200	1.11	0%	0.35
O-2	26,460	0.57	44%	0.59
O-3	5,741,223	131.80	-	0.49
PROP TOTAL	6,046,276	138.80		

Basin Confluence	Symbol
Existing	
(E-1 & O-2)	CP-1
(CP-1 & O-3)	DP-1
Proposed	
(P-1 & P-2)	CP-1
(CP-1 & P-3)	CP-2
(CP-2 & O-1)	CP-3
(CP-3 & O-2)	CP-4
(CP-4 & O-3)	DP-1

(A) CP # - Confluence Point

(B) DP # - Discharge Point

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

C value for impervious surfaces is 0.90

Basins with mixed surface type use a weighted average
of these 2 values. (impervious % x 0.90)+(pervious % x 0.35)

FALLBROOK SELF-STORAGE

6/15/2026

EXISTING CONDITIONS - HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)

Sub-Basin	AREA Ac.	"C"	CA	ΣCA	Overland flow length (ft)	Concentrated Flow Length (ft)	S(%) (Initial)	S(%) (avg.)	Ti mins	Tt mins	T _c mins	I in/hr	Q cfs	NOTES 100-year, 6 hr storm
E-1	6.43	0.35	2.25	2.25	100.0	755.0	8.0%	6.1%	6.90	3.60	10.50	4.57	10.29	P(6)= 2.80
O-2	0.57	0.61	0.35	0.35	100.0	200.0	10.0%	10.7%	6.90	0.93	7.83	5.52	1.92	
Confluence calcs for E-1 and O-2											10.50	4.57	11.88	Q(T1)
											7.83	5.52	9.60	Q(T2)
											10.50	4.57	11.88	
O-3	131.80	0.49	64.58	64.58	85.0	3443.0	2.0%	1.6%	8.80	20.17	28.97	2.38	153.42	
											28.97	2.38	159.59	Q(T1)
											10.50	4.57	67.47	Q(T2)
											28.97	2.38	159.59	DP-1

Tt Calculations

Basin	Concentrated Flow Length (ft)	Height (ft)	Slope Avg (%)	Calc Method	V (fps)	Tt (mins)
E-1	755.00	52.00	6.1%	Natural Watershed - Kirpich	-	3.60
O-2	200.00	32.00	10.7%	Natural Watershed - Kirpich	-	0.93
O-3	3443.00	56.00	1.6%	Natural Watershed - Kirpich	-	20.17

$$T_t = \left(\frac{11.9L^3}{E} \right)^{0.385} \text{ (Natural Watersheds)}$$

Composite Runoff Coefficient Calculations

Basin	Total Area (sf)	Imp. Area (sf)	Pervious Area (sf)	Imperv C-Value	Pervious C-Value	Imp. %	Runoff Coefficient Calculations
E-1	280093	0	280093	0.90	0.35	0%	$C = (0.90 * 0) + 0.35 * (1-0) = 0.35$
O-2	24960	11660	13300	0.90	0.35	47%	$C = (0.90 * 0.47) + 0.35 * (1-0.47) = 0.61$
O-3	5741223	-	-	-	-	-	$C = 0.49$, Assumed Medium Density Residential, 2.9 DU/A or less

$$C = 0.90 \times (\% \text{ Impervious}) + C_p \times (1 - \% \text{ Impervious})$$

Where: C_p = Pervious Coefficient Runoff Value for the soil type (shown in Table 3-1 as Undisturbed Natural Terrain/Permanent Open Space, 0% Impervious). Soil type can be determined from the soil type map provided in Appendix A.

FALLBROOK SELF-STORAGE

6/15/2026

PROPOSED CONDITIONS (UNMITIGATED)- HYDROLOGY AND HYDRAULICS CALCS (Table No. 3)

Sub-Basin	AREA Ac.	"C"	CA	ΣCA	Overland flow length (ft)	Concentrated Flow Length (ft)	S(%) (Initial)	S(%) (avg.)	Ti mins	Tt mins	T _c mins	I in/hr	Q cfs	NOTES 100-year, 6 hr storm	
P-1	2.73	0.82	2.24	2.24	60.0	250.0	12.5%	4.3%	2.40	0.99	5.00	7.38	16.56	P(6)= 2.80	
P-2	2.09	0.78	1.63	1.63	60.0	320.0	1.0%	0.9%	4.10	1.20	5.30	7.11	11.60		
Confluence calcs for P-1 and P-2											5.00	7.38	27.51		Q(T1)
											5.30	7.11	27.55		Q(T2)
											5.30	7.11	27.55		CP-1
P-3	0.48	0.63	0.30	0.30	90.0	260.0	4.7%	3.8%	2.90	1.65	5.00	7.38	2.21		
CP-1	-	-	-	-	-	-					5.30	7.11	27.55		
Confluence calcs for CP-1 and P-3											5.00	7.38	28.22		Q(T1)
											5.30	7.11	29.68		Q(T2)
											5.30	7.11	29.68		CP-2
O-1	1.11	0.35	0.39	0.39	100.0	870.0	8.0%	5.1%	6.90	2.90	9.80	4.78	1.85		
CP-2	-	-	-	-	-	-					5.30	7.11	29.68		
Confluence calcs for CP-2 and O-1											9.80	4.78	21.81		Q(T1)
											5.30	7.11	30.68		Q(T2)
											5.30	7.11	30.68		CP-3
O-2	0.61	0.61	0.37	0.37	100.0	200.0	10.0%	10.7%	6.90	0.93	7.83	5.52	2.04		
Confluence calcs for CP-3 and O-2											5.30	7.11	32.06		Q(T1)
											7.83	5.52	25.87		Q(T2)
											5.30	7.11	32.06		CP-4
O-3	131.80	0.49	64.58	64.58	85.0	3443	2.0%	1.6%	8.80	20.17	28.97	2.38	153.42		
											5.30	7.11	60.10		Q(T1)
											28.97	2.38	164.13		Q(T2)
											28.97	2.38	164.13		DP-1
Composite Runoff Coefficient Calculations															
Basin	Total Area (sf)	Imp. Area (sf)	Pervious Area (sf)	Imp C-Value	Perv C-Value	Imp. %	Runoff Coefficient Calculations								
P-1	118724	102188	16536	0.90	0.35	86%	C = (0.90 * 0.86) + 0.35 * (1-0.86) = 0.82								
P-2	90926	71357	19569	0.90	0.35	78%	C = (0.90 * 0.78) + 0.35 * (1-0.78) = 0.78								
P-3	20743	10503	10240	0.90	0.35	51%	C = (0.90 * 0.51) + 0.35 * (1-0.51) = 0.63								
O-1	48200	0	48200	0.90	0.35	0%	C = (0.90 * 0) + 0.35 * (1-0) = 0.35								
O-2	26460	11660	14800	0.90	0.35	44%	C = (0.90 * 0.44) + 0.35 * (1-0.44) = 0.59								
O-3	5741223	-	-	-	-	-	C = 0.49, Assumed Medium Density Residential, 2.9 DU/A or less								

FALLBROOK SELF-STORAGE

6/15/2026

PROPOSED CONDITIONS (MITIGATED)- HYDROLOGY AND HYDRAULICS CALCS (Table No. 4)

Sub-Basin	AREA Ac.	"C"	CA	ΣCA	Overland flow length (ft)	Concentrated Flow Length (ft)	S(%) (Initial)	S(%) (avg.)	Ti mins	Tt mins	T _c mins	I in/hr	Q cfs	NOTES 100-year, 6 hr storm
P-1	2.73	0.82	2.24	2.24	60.0	250.0	12.5%	4.3%	2.40	0.99	5.00	7.38	3.04	P(6)= 2.80
P-2	2.09	0.78	1.63	1.63	60.0	320.0	1.0%	0.9%	4.10	1.20	5.30	7.11	2.73	
Confluence calcs for P-1 and P-2											5.00	7.38	5.62	
											5.30	7.11	5.66	
											5.30	7.11	5.66	CP-1
P-3	0.48	0.63	0.30	0.30	90.0	260.0	4.7%	3.8%	2.90	1.65	5.00	7.38	2.21	
CP-1	-	-	-	-	-	-					5.30	7.11	5.66	
Confluence calcs for CP-1 and P-3											5.00	7.38	7.55	
											5.30	7.11	7.79	
											5.30	7.11	7.79	CP-2
O-1	1.11	0.35	0.39	0.39	100.0	870.0	8.0%	5.1%	6.90	2.90	9.80	4.78	1.85	
CP-2	-	-	-	-	-	-					5.30	7.11	7.79	
Confluence calcs for CP-2 and O-1											9.80	4.78	7.09	
											5.30	7.11	8.79	
											5.30	7.11	8.79	CP-3
O-2	0.61	0.61	0.37	0.37	100.0	200.0	10.0%	10.7%	6.90	0.93	7.83	5.52	2.04	
Confluence calcs for CP-3 and O-2											5.30	7.11	10.16	
											7.83	5.52	8.86	
											5.30	7.11	10.16	
														CP-4
O-3	131.80	0.49	64.58	64.58	85.0	3443	2.0%	1.6%	8.80	20.17	28.97	2.38	153.42	
											5.30	7.11	38.21	
											28.97	2.38	156.82	
											28.97	2.38	156.82	
														DP-1
Composite Runoff Coefficient Calculations														
Basin	Total Area (sf)	Imp. Area (sf)	Pervious Area (sf)	Imp C-Value	Perv C-Value	Imp. %	Runoff Coefficient Calculations							
P-1	118724	102188	16536	0.90	0.35	86%	C = (0.90 * 0.86) + 0.35 * (1-0.86) = 0.82							
P-2	90926	71357	19569	0.90	0.35	78%	C = (0.90 * 0.78) + 0.35 * (1-0.78) = 0.78							
P-3	20743	10503	10240	0.90	0.35	51%	C = (0.90 * 0.51) + 0.35 * (1-0.51) = 0.63							
O-1	48200	0	48200	0.90	0.35	0%	C = (0.90 * 0) + 0.35 * (1-0) = 0.35							
O-2	26460	11660	14800	0.90	0.35	44%	C = (0.90 * 0.44) + 0.35 * (1-0.44) = 0.59							
O-3	5741223	-	-	-	-	-	C = 0.49, Assumed Medium Density Residential, 2.9 DU/A or less							

FALLBROOK SELF-STORAGE
PROPOSED Tt CALCS (Table No. 5)

6/15/2026

Tt Calculations

Basin	Concentrated Flow Length (ft)	Height (ft)	Slope Avg (%)	Calc Method	V (fps)	Tt (mins)	
P-1	250.00	13.30	4.3%	Gutter Velocity	4.23	3.60	$Tt = \frac{L}{V * (60 \frac{sec}{min})}$ (Gutter Velocity)
P-2	320.00	3.30	0.9%	Gutter Velocity	4.46	0.93	
P-3	260.00	13.15	3.8%	Gutter Velocity	2.62	20.17	
O-1	870.00	49.5	5.1%	Gutter Velocity	5.00		
O-2	200.00	32.00	10.7%	Natural Watershed - Kirpich	-		$Tt = \left(\frac{11.9L^3}{E} \right)^{0.385}$ (Natural Watersheds)
O-3	3443.00	56.00	1.6%	Natural Watershed - Kirpich	-		

Appendix 1

Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods for Structural BMPs

The following table summarizes public data sources available for the infiltration restriction analysis.

Table B.2-2: Public Data Sources for Infiltration Restriction Analysis

Resources	Description
Geotracker	Website: geotracker.waterboards.ca.gov Reference Layers: Groundwater Depths, Contaminated Sites/Soils
SANGIS	Website: sangis.org Reference Layers: Land Use Current, Gas Stations, Wells, Groundwater Basins, Flowlines, Liquefaction, Soils, Steep Slopes, Sewer, Topography, Elevation Grids
Web Soil Survey (NRCS Soil Type)	Website: websoilsurvey.sc.egov.usda.gov/App Reference Layers: Hydrologic Soil Group, Map Unit Names
Watershed Management Area Analysis	Website: projectcleanwater.org/watershed-management-area-analysis-wmaa Reference Layers: Electronic Data from Appendix C of WMAA
Survey Records System	Website: srs.sandiegocounty.gov Reference Layers: Grading Plans, Surveys, Drainage Plans, Topography Maps, Tentative Parcel Maps
Applicant Plans	Website: n/a Reference Layers: Utility Plans, Grading Plans, Existing Site Conditions, Proposed Site Conditions, Nearby geotechnical reports.
Geotechnical Engineer	Website: n/a Reference Layers: At discretion of Geotechnical Engineer

B.2.3 Step 2C – Design Infiltration Rate

The design infiltration rate for each drainage area must be determined through either a basic or advanced analysis. The basic analysis allows the SWQMP Preparer to assign a default design infiltration rate based on the predominant NRCS soil type present within the proposed BMP footprint. The advanced analysis allows for a geotechnical engineer to assign a more specific design infiltration rate based on field testing outlined in Appendix D. Table B.2-3 below identifies the design infiltration rates that can be used for each analysis. Please note that the basic analysis is not permitted for BMPs that lack an underdrain.

Table B.2-3: Design Infiltration Rate

Infiltration Restrictions	Design Infiltration Rate (in/hr)	
	Option 1: Basic Analysis	Option 2: Advanced Analysis
Unrestricted	Type A Soil = 0.300	Rate recommended by geotechnical engineer (Reference Appendix D)
Unrestricted	Type B Soil = 0.200	
Unrestricted	Type C Soil = 0.100	
Unrestricted	Type D Soil = 0.025	
Restricted	Any Soil = 0.000	0.000

B.2.4 Step 2D - Retention Requirement

Using information determined in previous steps, the retention requirement can now be determined. Retention requirement is the percentage of annual runoff that must be retained within the drainage area.

The Geotechnical Investigation performed infiltration testing with the resulting infiltration being of 0.009 inches/hour. Per this table, the resulting infiltration rate if more representative of Type D soils.

Appendix 2

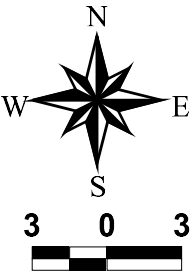
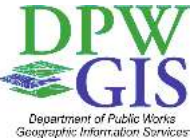
County of San Diego Hydrology Manual



Rainfall Isophuvials

100 Year Rainfall Event - 6 Hours

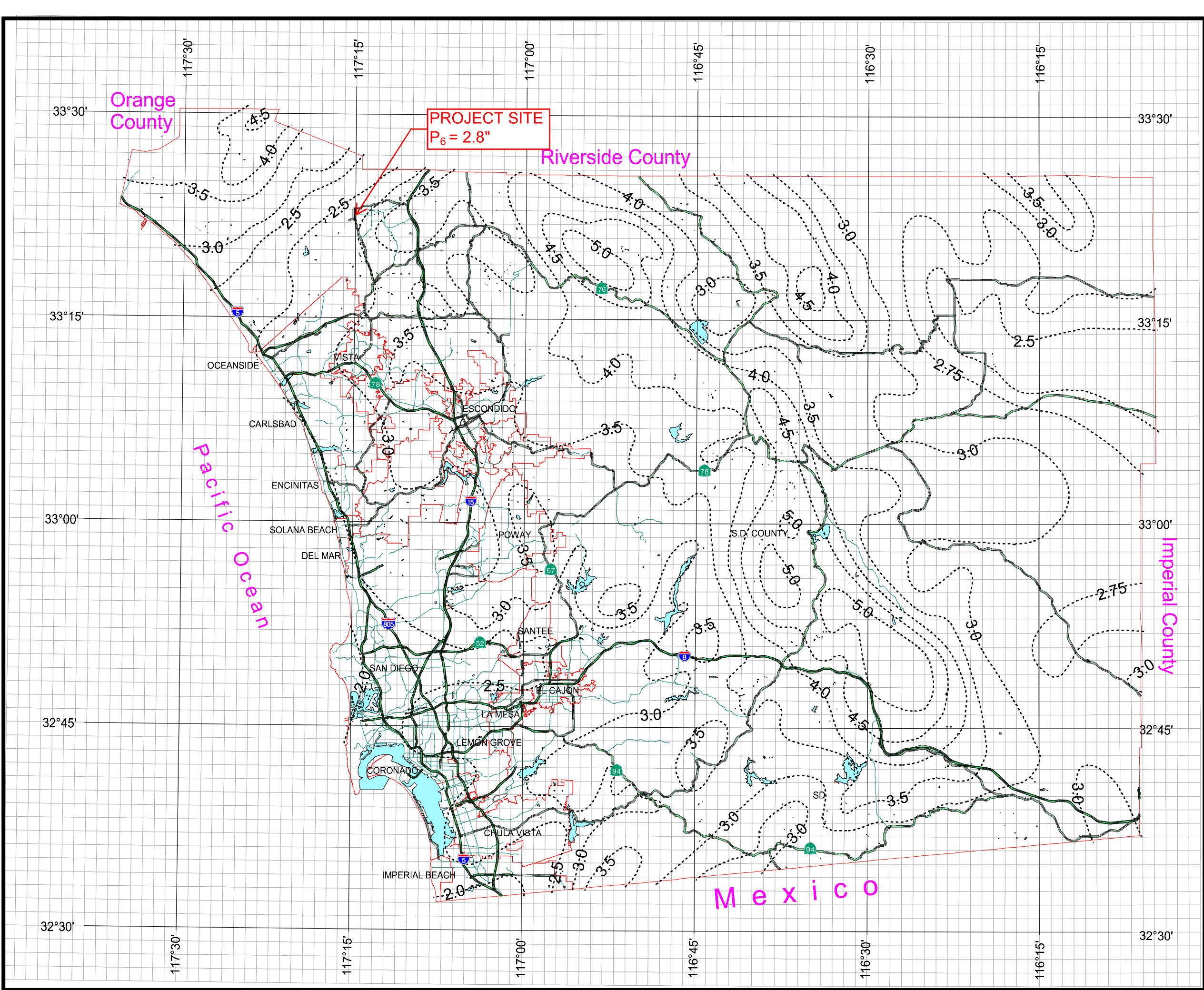
----- Isopluvial (inches)



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Appendix 3

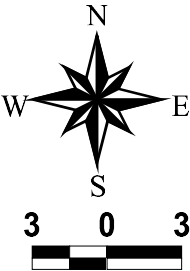
County of San Diego Hydrology Manual



Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

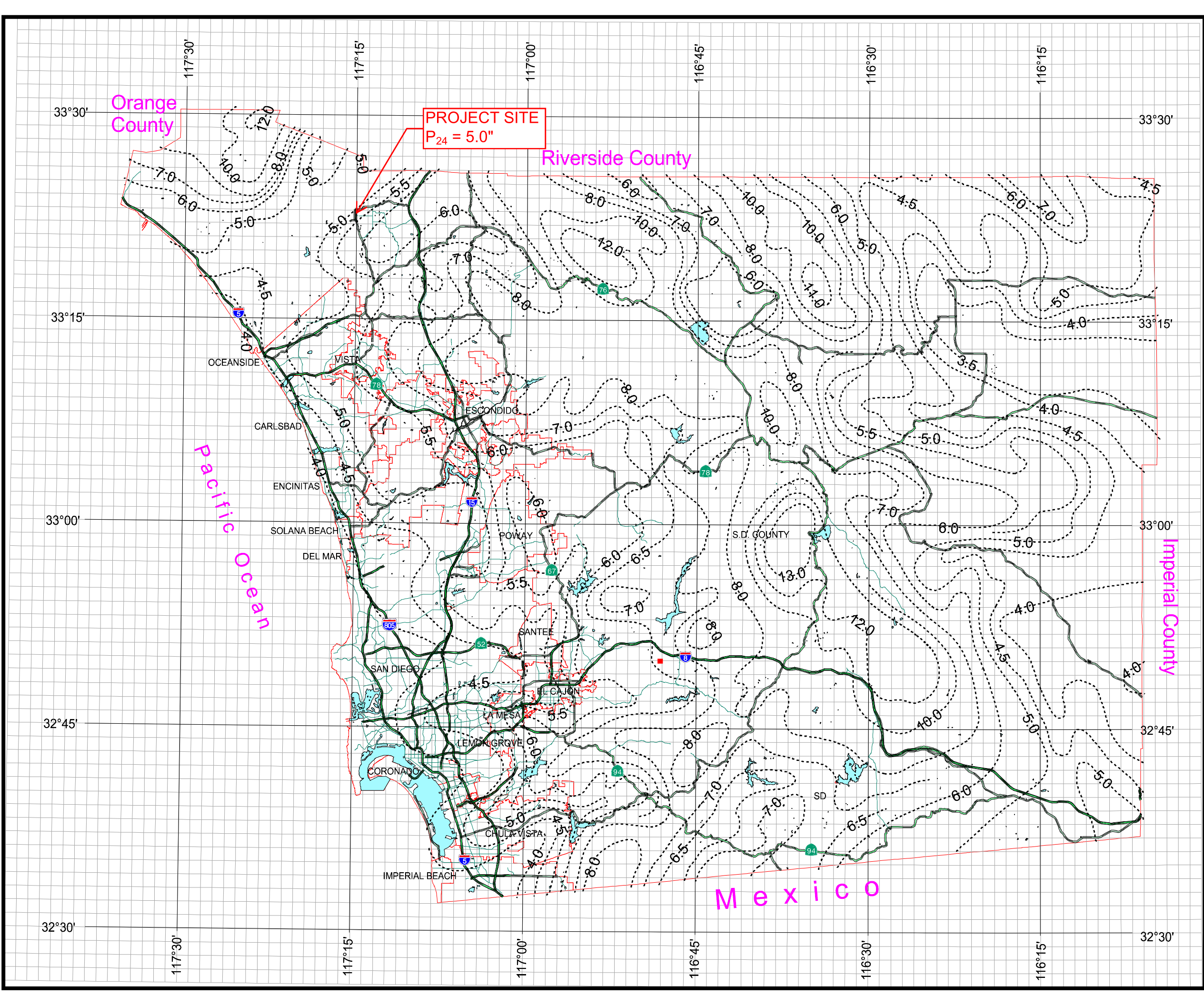
----- Isopluvial (inches)



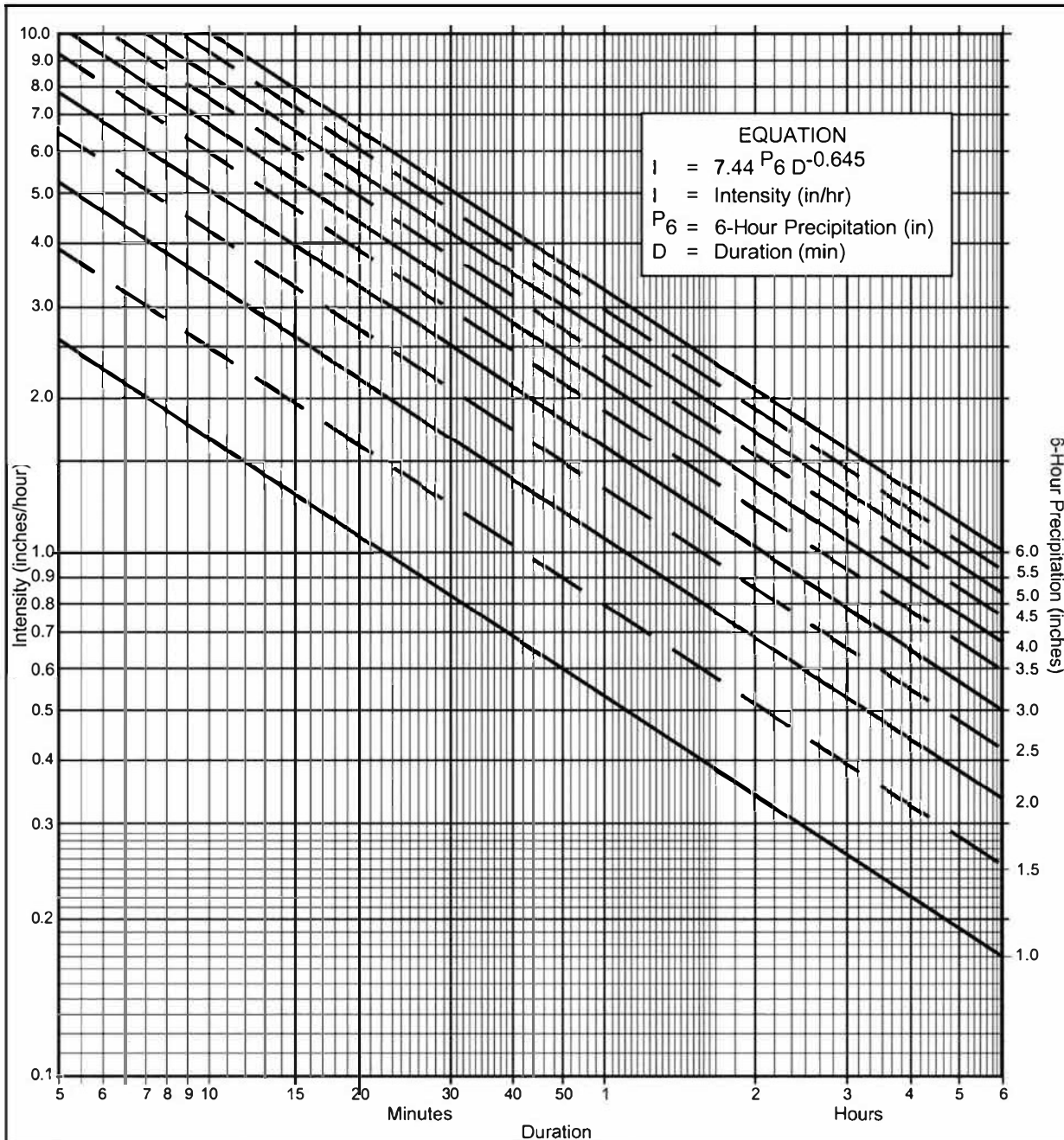
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Appendix 4



Directions for Application:

- (1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).
- (2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).
- (3) Plot 6 hr precipitation on the right side of the chart.
- (4) Draw a line through the point parallel to the plotted lines.
- (5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

- (a) Selected frequency 100 year
- (b) $P_6 = \underline{2.8}$ in., $P_{24} = \underline{5.0}$ in., $\frac{P_6}{P_{24}} = \underline{56} \%^{(2)}$
- (c) Adjusted $P_6^{(2)} = \underline{n/a}$ in.
- (d) $t_x = \underline{\hspace{2cm}}$ min. **T & I per Rational**
- (e) $I = \underline{\hspace{2cm}}$ in./hr. **Calc sheet**

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

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

Intensity-Duration Design Chart - Template

FIGURE

3-1

Appendix 5

**Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS**

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

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, C_p , for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre

NRCS = National Resources Conservation Service

Appendix 6

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

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

Table 3-2

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

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.2
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.5	100	1.9

Basins E-1,
O-2 & O-1

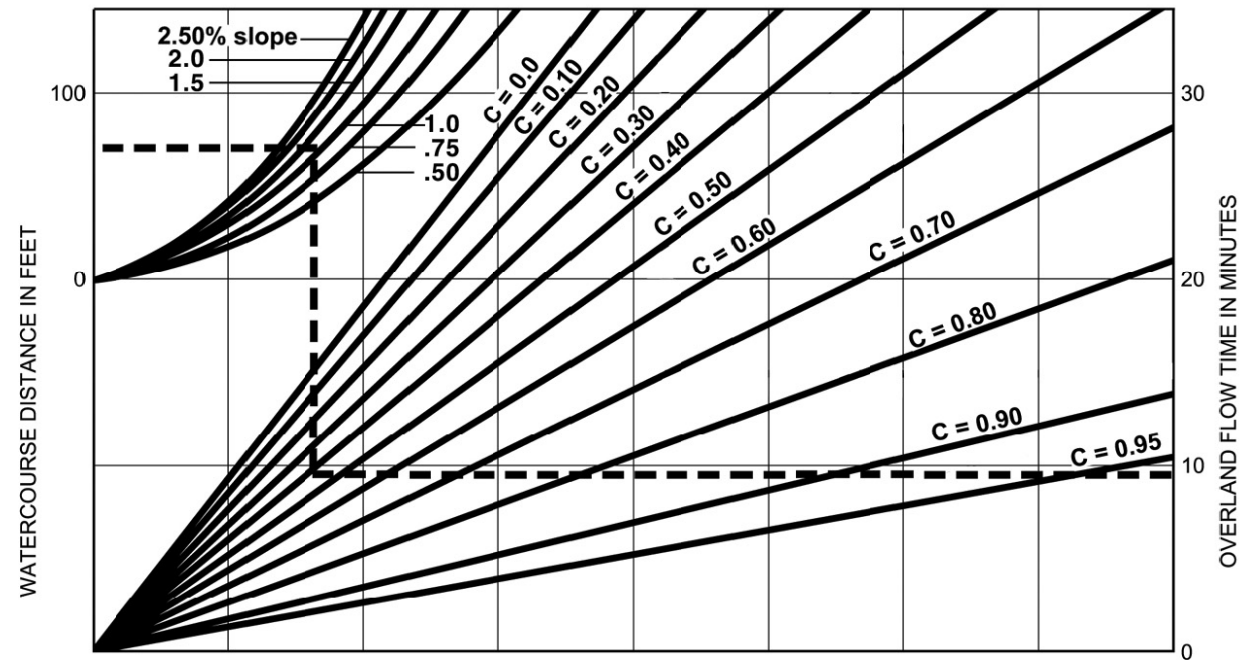
Basin P-2

Basin P-3

Basin P-1

*See Table 3-1 for more detailed description

Appendix 7



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
 Slope (s) = 1.3%
 Runoff Coefficient (C) = 0.41
 Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8 (1.1-C) \sqrt{D}}{\sqrt[3]{s}}$$

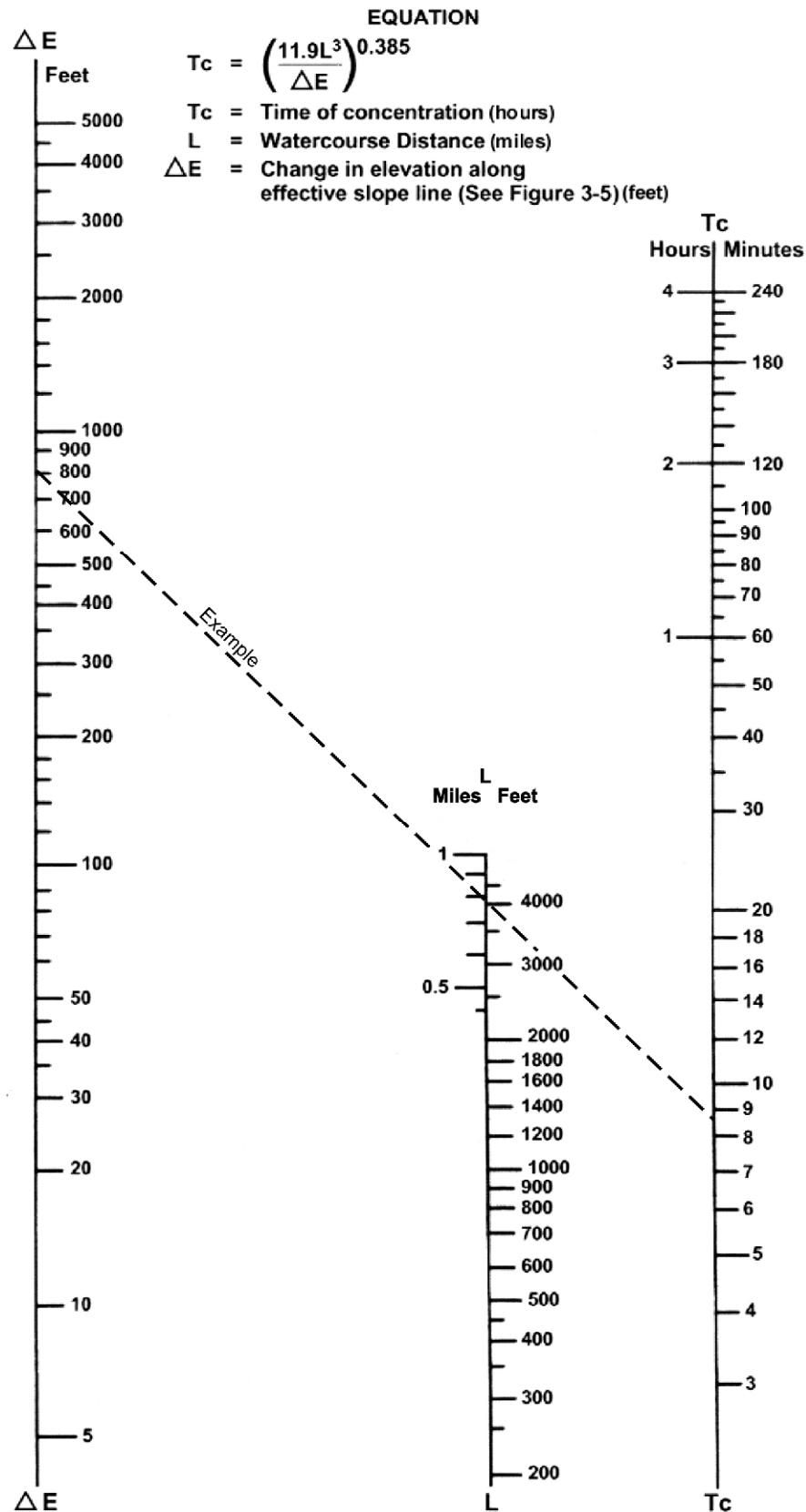
SOURCE: Airport Drainage, Federal Aviation Administration, 1965

F I G U R E

Rational Formula - Overland Time of Flow Nomograph

3-3

Appendix 8



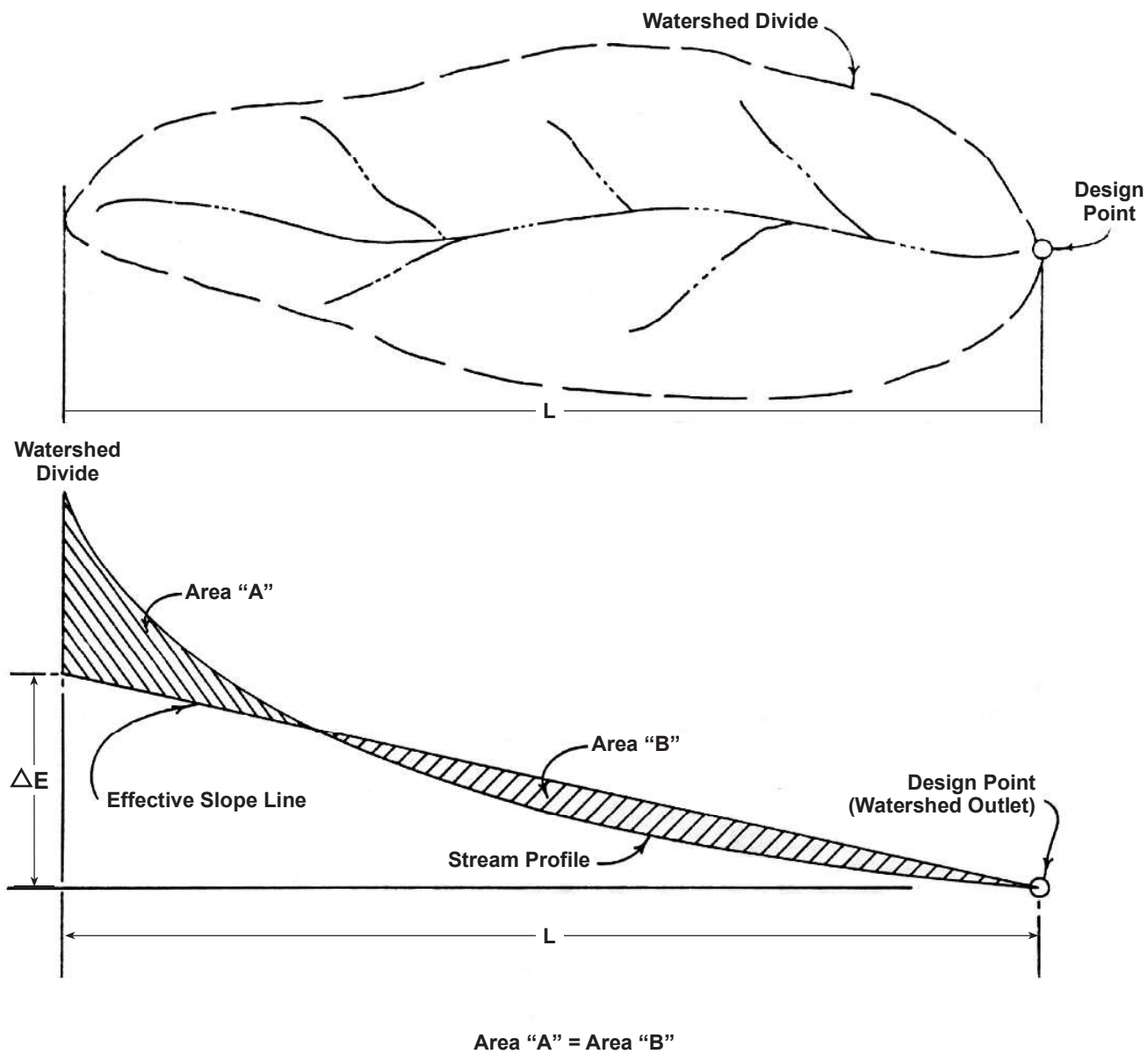
SOURCE: California Division of Highways (1941) and Kirpich (1940)

F I G U R E

Nomograph for Determination of
Time of Concentration (T_c) or Travel Time (T_t) for Natural Watersheds

3-4

Appendix 9



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE

Computation of Effective Slope for Natural Watersheds

3-5

Appendix 10

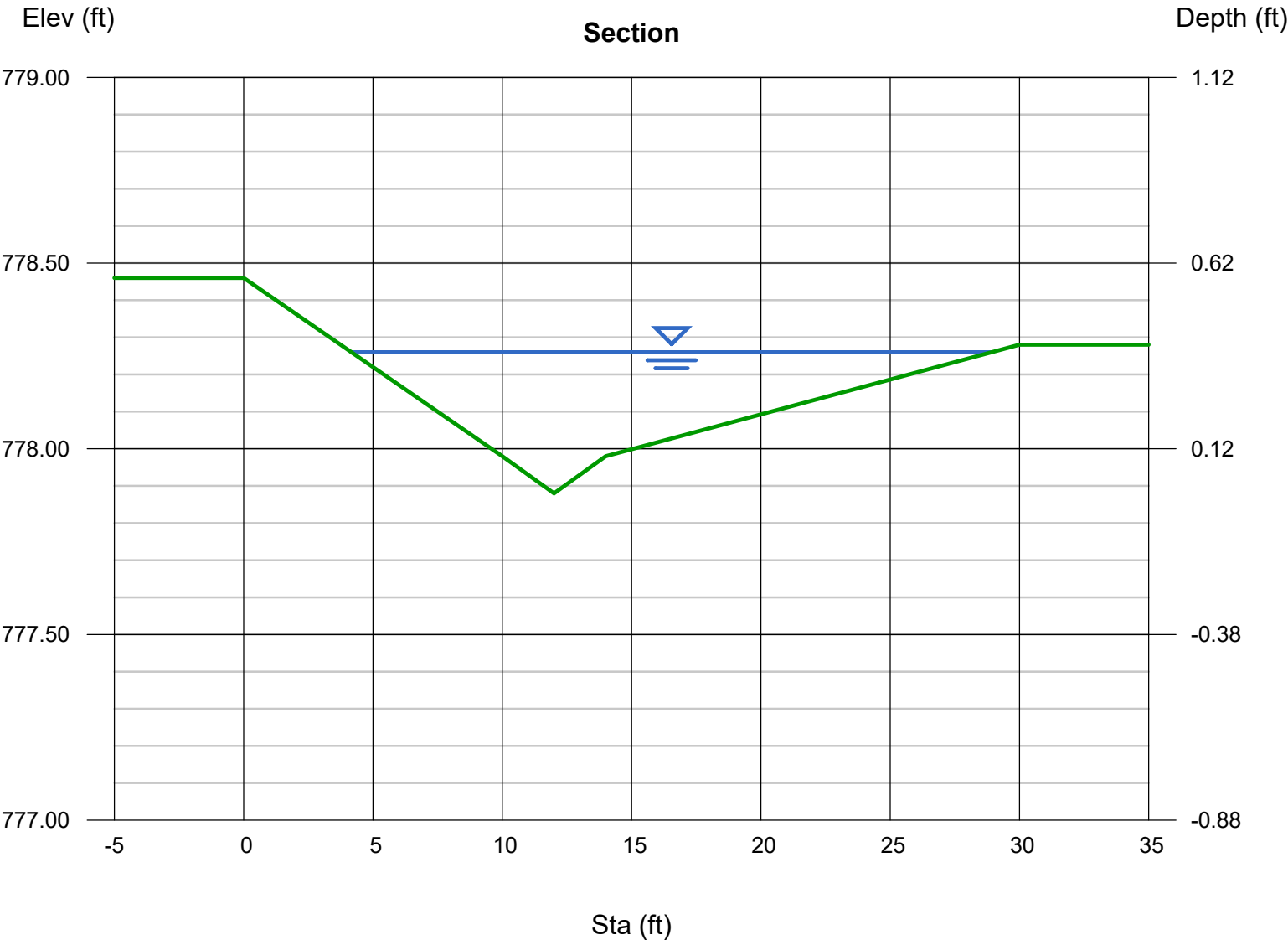
Channel Report

Cross-Section A-A - Basin P-1 Gutter Velocity Calculations

User-defined		Highlighted	
Invert Elev (ft)	= 777.88	Depth (ft)	= 0.38
Slope (%)	= 1.00	Q (cfs)	= 14.00
N-Value	= 0.013	Area (sqft)	= 4.23
		Velocity (ft/s)	= 3.31
		Wetted Perim (ft)	= 24.78
		Crit Depth, Yc (ft)	= 0.43
		Top Width (ft)	= 24.77
		EGL (ft)	= 0.55

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

(0.00, 778.46)-(10.00, 777.98, 0.013)-(12.00, 777.88, 0.013)-(14.00, 777.98, 0.013)-(30.00, 778.28, 0.013)



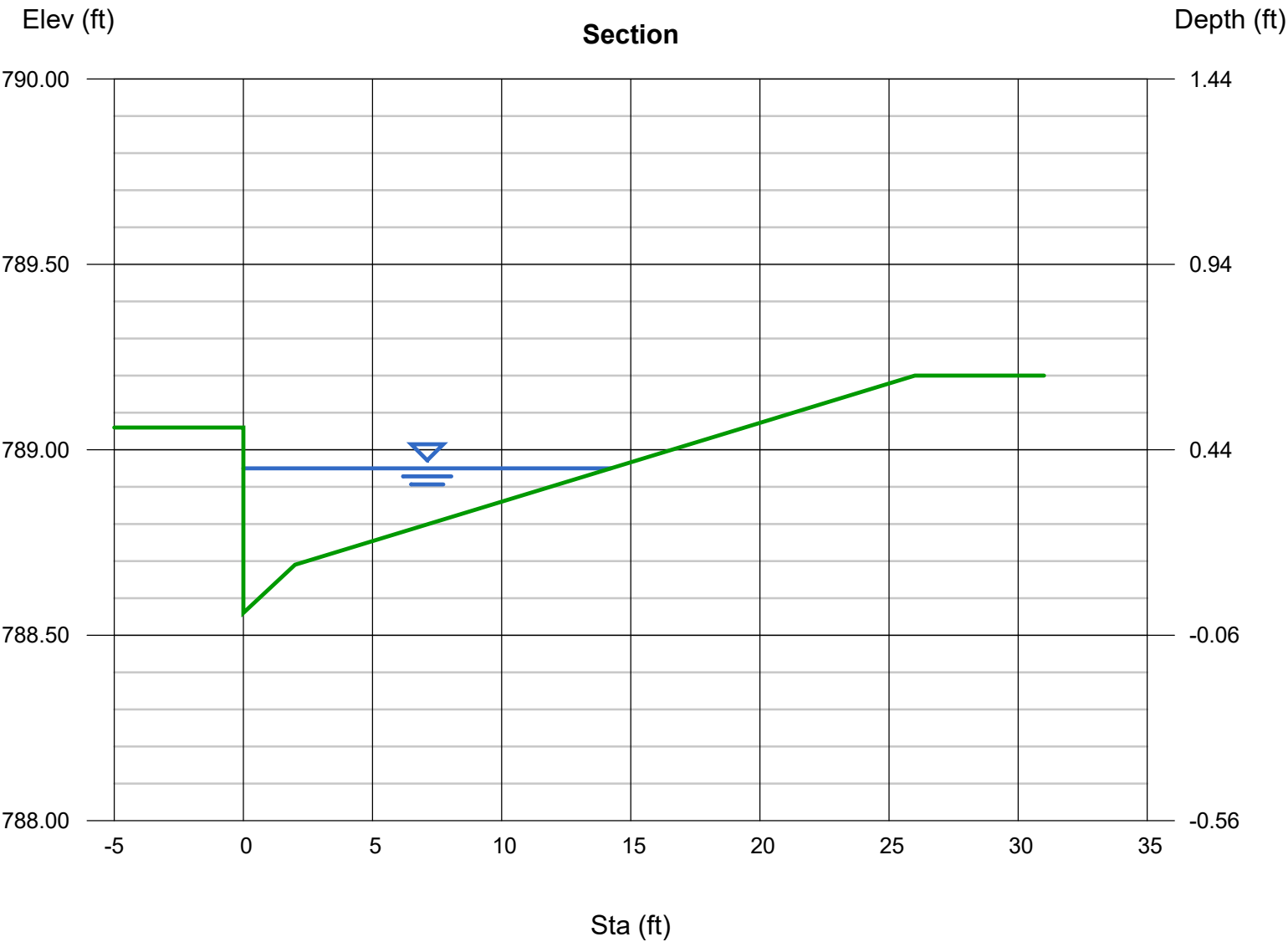
Channel Report

Cross-Section B-B - Basin P-2 Gutter Velocity Calculations

User-defined		Highlighted	
Invert Elev (ft)	= 788.56	Depth (ft)	= 0.39
Slope (%)	= 2.00	Q (cfs)	= 10.00
N-Value	= 0.013	Area (sqft)	= 2.24
		Velocity (ft/s)	= 4.46
		Wetted Perim (ft)	= 14.63
		Crit Depth, Yc (ft)	= 0.49
		Top Width (ft)	= 14.24
		EGL (ft)	= 0.70

Calculations
Compute by: Known Q
Known Q (cfs) = 10.00

(Sta, El, n)-(Sta, El, n)...
(0.00, 789.06)-(0.00, 788.56, 0.013)-(2.00, 788.69, 0.013)-(26.00, 789.20, 0.013)



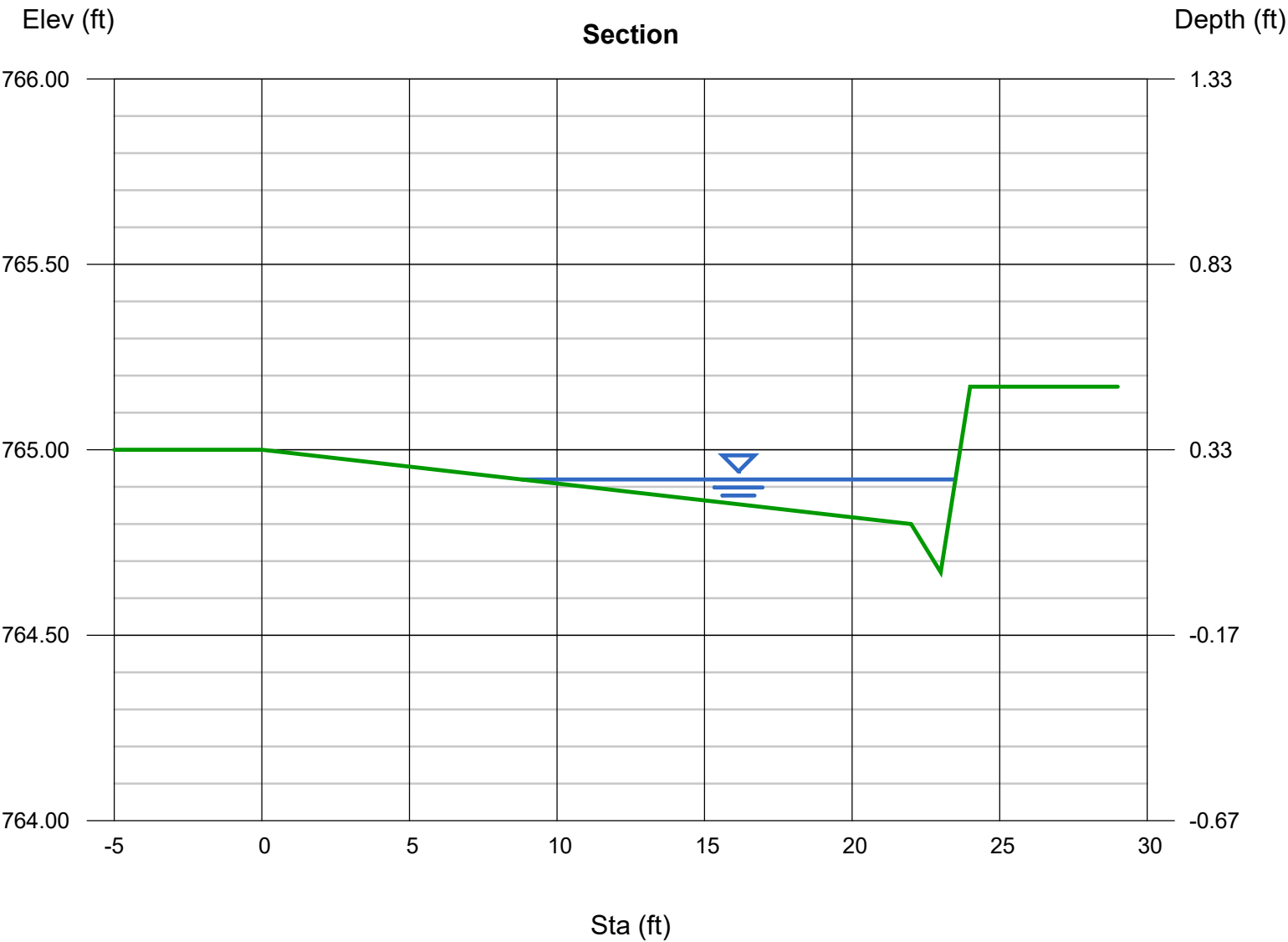
Channel Report

Cross-Section C-C - Basin P-3 Gutter Velocity Calculations

User-defined		Highlighted	
Invert Elev (ft)	= 764.67	Depth (ft)	= 0.25
Slope (%)	= 1.80	Q (cfs)	= 2.721
N-Value	= Composite	Area (sqft)	= 1.04
		Velocity (ft/s)	= 2.62
		Wetted Perim (ft)	= 14.77
		Crit Depth, Yc (ft)	= 0.29
		Top Width (ft)	= 14.70
		EGL (ft)	= 0.36

Calculations
Compute by: Q vs Depth
No. Increments = 10

(Sta, El, n)-(Sta, El, n)...
(0.00, 765.00)-(22.00, 764.80, 0.013)-(23.00, 764.67, 0.013)-(24.00, 765.17, 0.013)



Appendix 11

[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option Value
FLOW_UNITS CFS
INFILTRATION GREEN_AMPT
FLOW_ROUTING KINWAVE
LINK_OFFSETS DEPTH
MIN_SLOPE 0
ALLOW_PONDING NO
SKIP_STEADY_STATE NO

START_DATE 12/03/2024
START_TIME 00:00:00
REPORT_START_DATE 12/03/2024
REPORT_START_TIME 00:00:00
END_DATE 12/03/2024
END_TIME 12:00:00
SWEEP_START 01/01
SWEEP_END 12/31
DRY_DAYS 0
REPORT_STEP 00:00:01
WET_STEP 00:00:01
DRY_STEP 00:00:01
ROUTING_STEP 0:00:01
RULE_STEP 00:00:00

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

```
MINIMUM_STEP      0.5
THREADS           1
```

[EVAPORATION]

```
;;Data Source      Parameters
```

;;-----

CONSTANT	0.0
----------	-----

DRY_ONLY NO

[OUTFALLS]

;;Name	Elevation	Type	Stage Data	Gated	Route To
--------	-----------	------	------------	-------	----------

;;-----

DP-1	0	FREE
------	---	------

DP-2	0	FREE
------	---	------

[STORAGE]

Name	Elev.	MaxDepth	InitDepth	Shape	Curve	Name/Params	N/A	Fevap	Psi	Ksat
------	-------	----------	-----------	-------	-------	-------------	-----	-------	-----	------

IMD

.....

BMP-1	0	2.0	0	TABULAR	BMP-1	0	0
-------	---	-----	---	---------	-------	---	---

BMP-2	0	2.0	0	TABULAR	BMP-2	0	0
-------	---	-----	---	---------	-------	---	---

[OUTLETS]

; Name	From Node	To Node	Offset	Type	QTable/Qcoeff	Qexpon	Gated
--------	-----------	---------	--------	------	---------------	--------	-------

RISER_1	BMP-1	DP-1	0	TABULAR/HEAD	12_NYLO	NO
---------	-------	------	---	--------------	---------	----

RISER_2	BMP-2	DP-2	0	TABULAR/HEAD	12_NYLO	NO
---------	-------	------	---	--------------	---------	----

[INFLOWS]

;;Node	Constituent	Time Series	Type	Mfactor	Sfactor	Baseline Pattern
--------	-------------	-------------	------	---------	---------	------------------

BMP-1	FLOW	P-1	FLOW	1.0	1.0
-------	------	-----	------	-----	-----

BMP-2	FLOW	P-2	FLOW	1.0	1.0
-------	------	-----	------	-----	-----

[CURVES]

;;Name	Type	X-Value	Y-Value
--------	------	---------	---------

;;-----

12_NYLO	Rating	0	0
12_NYLO		0.05	0.05
12_NYLO		0.10	0.30
12_NYLO		0.15	0.55
12_NYLO		0.20	0.85
12_NYLO		0.25	1.15
12_NYLO		0.30	1.27
12_NYLO		0.35	1.35
12_NYLO		0.40	1.47
12_NYLO		0.45	1.57
12_NYLO		0.50	1.65
12_NYLO		0.55	1.72
12_NYLO		0.60	1.80
12_NYLO		0.65	1.85
12_NYLO		0.70	1.95
12_NYLO		0.75	2.02
12_NYLO		0.80	2.07
12_NYLO		0.85	2.12
12_NYLO		0.90	2.22
12_NYLO		0.95	2.27
12_NYLO		1.0	2.32
12_NYLO		1.05	2.37
12_NYLO		1.10	2.45
12_NYLO		1.15	2.50
12_NYLO		1.20	2.54
12_NYLO		1.25	2.58
12_NYLO		1.30	2.62
12_NYLO		1.35	2.68
12_NYLO		1.40	2.72
12_NYLO		1.45	2.76
12_NYLO		1.50	2.80
12_NYLO		1.55	2.84
12_NYLO		1.60	2.88
12_NYLO		1.65	2.92
12_NYLO		1.70	2.96
12_NYLO		1.75	3
12_NYLO		1.80	3.02
12_NYLO		1.85	3.04

12_NYLO		1.90	3.06
12_NYLO		1.95	3.08
12_NYLO		2	3.10
;			
BMP-1	Storage	0	2850
BMP-1		1	3700
BMP-1		2	4605
;			
BMP-2	Storage	0	2405
BMP-2		1	3370
BMP-2		2	4390

[TIMESERIES]

;;Name	Date	Time	Value
;;-----			
P-1		0:00	0
P-1		0:05	0.4
P-1		0:10	0.4
P-1		0:15	0.4
P-1		0:20	0.4
P-1		0:25	0.4
P-1		0:30	0.4
P-1		0:35	0.4
P-1		0:40	0.4
P-1		0:45	0.4
P-1		0:50	0.4
P-1		0:55	0.4
P-1		1:00	0.4
P-1		1:05	0.5
P-1		1:10	0.5
P-1		1:15	0.5
P-1		1:20	0.5
P-1		1:25	0.5
P-1		1:30	0.5
P-1		1:35	0.5
P-1		1:40	0.5
P-1		1:45	0.5
P-1		1:50	0.5

P-1	1:55	0.6
P-1	2:00	0.6
P-1	2:05	0.6
P-1	2:10	0.6
P-1	2:15	0.6
P-1	2:20	0.6
P-1	2:25	0.7
P-1	2:30	0.7
P-1	2:35	0.7
P-1	2:40	0.7
P-1	2:45	0.8
P-1	2:50	0.8
P-1	2:55	0.8
P-1	3:00	0.9
P-1	3:05	0.9
P-1	3:10	1
P-1	3:15	1
P-1	3:20	1.1
P-1	3:25	1.2
P-1	3:30	1.3
P-1	3:35	1.5
P-1	3:40	1.6
P-1	3:45	2
P-1	3:50	2.2
P-1	3:55	3.3
P-1	4:00	4.6
P-1	4:05	16.56
P-1	4:10	2.6
P-1	4:15	1.8
P-1	4:20	1.4
P-1	4:25	1.2
P-1	4:30	1
P-1	4:35	0.9
P-1	4:40	0.8
P-1	4:45	0.7
P-1	4:50	0.7
P-1	4:55	0.6
P-1	5:00	0.6

P-1	5:05	0.6
P-1	5:10	0.5
P-1	5:15	0.5
P-1	5:20	0.5
P-1	5:25	0.5
P-1	5:30	0.5
P-1	5:35	0.4
P-1	5:40	0.4
P-1	5:45	0.4
P-1	5:50	0.4
P-1	5:55	0.4
P-1	6:00	0.4
P-1	6:05	0
;		
P-2	0:00	0
P-2	0:05	0.3
P-2	0:10	0.3
P-2	0:15	0.3
P-2	0:20	0.3
P-2	0:25	0.3
P-2	0:30	0.3
P-2	0:35	0.3
P-2	0:40	0.3
P-2	0:45	0.3
P-2	0:50	0.3
P-2	0:55	0.3
P-2	1:00	0.3
P-2	1:05	0.3
P-2	1:10	0.3
P-2	1:15	0.3
P-2	1:20	0.3
P-2	1:25	0.4
P-2	1:30	0.4
P-2	1:35	0.4
P-2	1:40	0.4
P-2	1:45	0.4
P-2	1:50	0.4
P-2	1:55	0.4

P-2	2:00	0.4
P-2	2:05	0.4
P-2	2:10	0.4
P-2	2:15	0.5
P-2	2:20	0.5
P-2	2:25	0.5
P-2	2:30	0.5
P-2	2:35	0.5
P-2	2:40	0.5
P-2	2:45	0.6
P-2	2:50	0.6
P-2	2:55	0.6
P-2	3:00	0.6
P-2	3:05	0.7
P-2	3:10	0.7
P-2	3:15	0.8
P-2	3:20	0.8
P-2	3:25	0.9
P-2	3:30	0.9
P-2	3:35	1.1
P-2	3:40	1.2
P-2	3:45	1.4
P-2	3:50	1.6
P-2	3:55	2.4
P-2	4:00	3.8
P-2	4:05	11.6
P-2	4:10	1.9
P-2	4:15	1.3
P-2	4:20	1
P-2	4:25	0.8
P-2	4:30	0.7
P-2	4:35	0.7
P-2	4:40	0.6
P-2	4:45	0.5
P-2	4:50	0.5
P-2	4:55	0.4
P-2	5:00	0.4
P-2	5:05	0.4

P-2	5:10	0.4
P-2	5:15	0.4
P-2	5:20	0.4
P-2	5:25	0.3
P-2	5:30	0.3
P-2	5:35	0.3
P-2	5:40	0.3
P-2	5:45	0.3
P-2	5:50	0.3
P-2	5:55	0.3
P-2	6:00	0.3
P-2	6:05	0

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 0.000 0.000 10000.000 10000.000
Units None

[COORDINATES]
;;Node X-Coord Y-Coord
;;-----
DP-1 4151.712 3612.514
DP-2 8599.624 3590.226
BMP-1 4144.737 7744.361
BMP-2 8599.624 7857.143

[VERTICES]
;;Link X-Coord Y-Coord
;;-----

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.014)

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 NO

RDII NO

Snowmelt NO

Groundwater NO

Flow Routing YES

Ponding Allowed NO

Water Quality NO

Flow Routing Method KINWAVE

Starting Date 12/03/2024 00:00:00

Ending Date 12/03/2024 12:00:00

Antecedent Dry Days 0.0

Report Time Step 00:00:01

Routing Time Step 1.00 sec

Flow Routing Continuity

Volume

acre-feet

Volume

10^6 gal

Dry Weather Inflow

0.000

0.000

Wet Weather Inflow

0.000

0.000

Groundwater Inflow

0.000

0.000

RDII Inflow

0.000

0.000

External Inflow	0.898	0.293
External Outflow	0.898	0.293
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	1.00 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.00
Percent Not Converging	:	0.00

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
DP-1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
DP-2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00

BMP-1	STORAGE	0.20	1.85	1.85	0	04:09	1.85
BMP-2	STORAGE	0.13	1.41	1.41	0	04:09	1.41

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
DP-1	OUTFALL	0.00	3.04	0 04:09	0	0.17	0.000
DP-2	OUTFALL	0.00	2.73	0 04:09	0	0.123	0.000
BMP-1	STORAGE	16.56	16.56	0 04:05	0.17	0.17	0.000
BMP-2	STORAGE	11.60	11.60	0 04:05	0.123	0.123	0.000

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
BMP-1	0.635	9	0	0	6.728	91	0 04:09	3.04
BMP-2	0.356	5	0	0	4.367	65	0 04:09	2.73

 Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
DP-1	78.94	0.66	3.04	0.170
DP-2	74.13	0.51	2.73	0.123
System	76.54	1.18	2.73	0.293

 Link Flow Summary

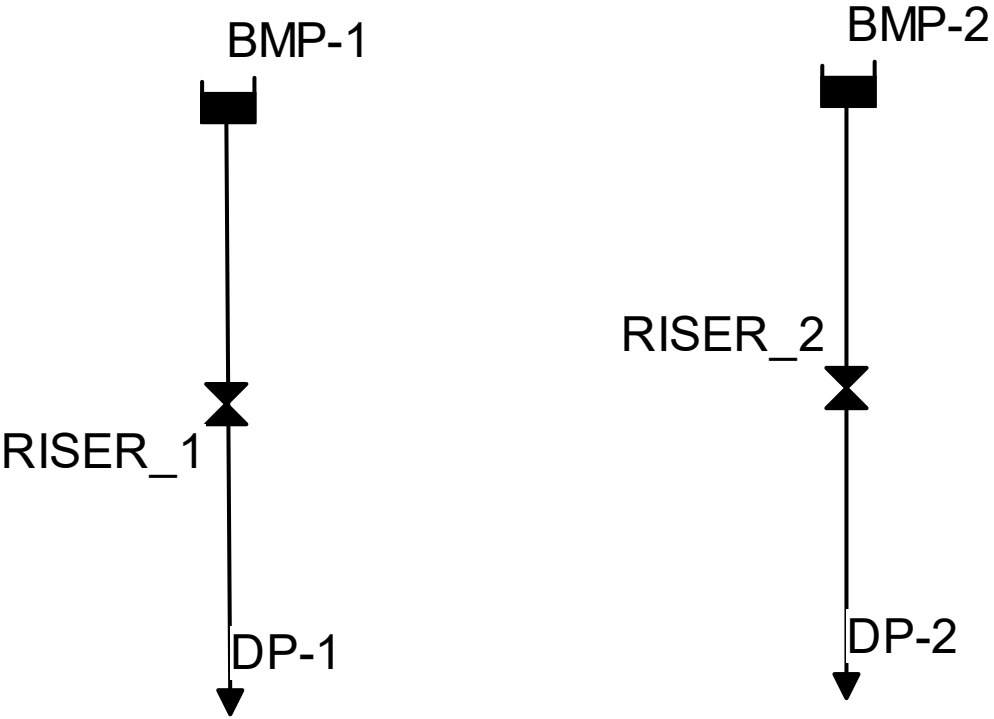
Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Veloc ft/sec	Max/ Full Flow	Max/ Full Depth
RISER_1	DUMMY	3.04	0 04:09			
RISER_2	DUMMY	2.73	0 04:09			

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Tue Jun 16 09:07:02 2026

Analysis ended on: Tue Jun 16 09:07:02 2026
Total elapsed time: < 1 sec



Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Day of Maximum Depth	Hour of Maximum Depth	Maximum Reported Depth Feet
DP-1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
DP-2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
BMP-1	STORAGE	0.20	1.85	1.85	0	04:09	1.85
BMP-2	STORAGE	0.13	1.41	1.41	0	04:09	1.41

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Day of Maximum Inflow	Hour of Maximum Inflow	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
DP-1	OUTFALL	0.00	3.04	0	04:09	0	0.17	0.000
DP-2	OUTFALL	0.00	2.73	0	04:09	0	0.123	0.000
BMP-1	STORAGE	16.56	16.56	0	04:05	0.17	0.17	0.000
BMP-2	STORAGE	11.60	11.60	0	04:05	0.123	0.123	0.000

RUN DATE 6/16/2026
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.8 INCHES
BASIN AREA 2.73 ACRES
RUNOFF COEFFICIENT 0.82
PEAK DISCHARGE 16.56 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.4
TIME (MIN) = 10	DISCHARGE (CFS) = 0.4
TIME (MIN) = 15	DISCHARGE (CFS) = 0.4
TIME (MIN) = 20	DISCHARGE (CFS) = 0.4
TIME (MIN) = 25	DISCHARGE (CFS) = 0.4
TIME (MIN) = 30	DISCHARGE (CFS) = 0.4
TIME (MIN) = 35	DISCHARGE (CFS) = 0.4
TIME (MIN) = 40	DISCHARGE (CFS) = 0.4
TIME (MIN) = 45	DISCHARGE (CFS) = 0.4
TIME (MIN) = 50	DISCHARGE (CFS) = 0.4
TIME (MIN) = 55	DISCHARGE (CFS) = 0.4
TIME (MIN) = 60	DISCHARGE (CFS) = 0.4
TIME (MIN) = 65	DISCHARGE (CFS) = 0.5
TIME (MIN) = 70	DISCHARGE (CFS) = 0.5
TIME (MIN) = 75	DISCHARGE (CFS) = 0.5
TIME (MIN) = 80	DISCHARGE (CFS) = 0.5
TIME (MIN) = 85	DISCHARGE (CFS) = 0.5
TIME (MIN) = 90	DISCHARGE (CFS) = 0.5
TIME (MIN) = 95	DISCHARGE (CFS) = 0.5
TIME (MIN) = 100	DISCHARGE (CFS) = 0.5
TIME (MIN) = 105	DISCHARGE (CFS) = 0.5
TIME (MIN) = 110	DISCHARGE (CFS) = 0.5
TIME (MIN) = 115	DISCHARGE (CFS) = 0.6
TIME (MIN) = 120	DISCHARGE (CFS) = 0.6
TIME (MIN) = 125	DISCHARGE (CFS) = 0.6
TIME (MIN) = 130	DISCHARGE (CFS) = 0.6
TIME (MIN) = 135	DISCHARGE (CFS) = 0.6
TIME (MIN) = 140	DISCHARGE (CFS) = 0.6
TIME (MIN) = 145	DISCHARGE (CFS) = 0.7
TIME (MIN) = 150	DISCHARGE (CFS) = 0.7
TIME (MIN) = 155	DISCHARGE (CFS) = 0.7
TIME (MIN) = 160	DISCHARGE (CFS) = 0.7
TIME (MIN) = 165	DISCHARGE (CFS) = 0.8
TIME (MIN) = 170	DISCHARGE (CFS) = 0.8
TIME (MIN) = 175	DISCHARGE (CFS) = 0.8
TIME (MIN) = 180	DISCHARGE (CFS) = 0.9
TIME (MIN) = 185	DISCHARGE (CFS) = 0.9
TIME (MIN) = 190	DISCHARGE (CFS) = 1
TIME (MIN) = 195	DISCHARGE (CFS) = 1
TIME (MIN) = 200	DISCHARGE (CFS) = 1.1
TIME (MIN) = 205	DISCHARGE (CFS) = 1.2
TIME (MIN) = 210	DISCHARGE (CFS) = 1.3
TIME (MIN) = 215	DISCHARGE (CFS) = 1.5
TIME (MIN) = 220	DISCHARGE (CFS) = 1.6
TIME (MIN) = 225	DISCHARGE (CFS) = 2
TIME (MIN) = 230	DISCHARGE (CFS) = 2.2
TIME (MIN) = 235	DISCHARGE (CFS) = 3.3
TIME (MIN) = 240	DISCHARGE (CFS) = 4.6
TIME (MIN) = 245	DISCHARGE (CFS) = 16.56
TIME (MIN) = 250	DISCHARGE (CFS) = 2.6
TIME (MIN) = 255	DISCHARGE (CFS) = 1.8
TIME (MIN) = 260	DISCHARGE (CFS) = 1.4
TIME (MIN) = 265	DISCHARGE (CFS) = 1.2
TIME (MIN) = 270	DISCHARGE (CFS) = 1

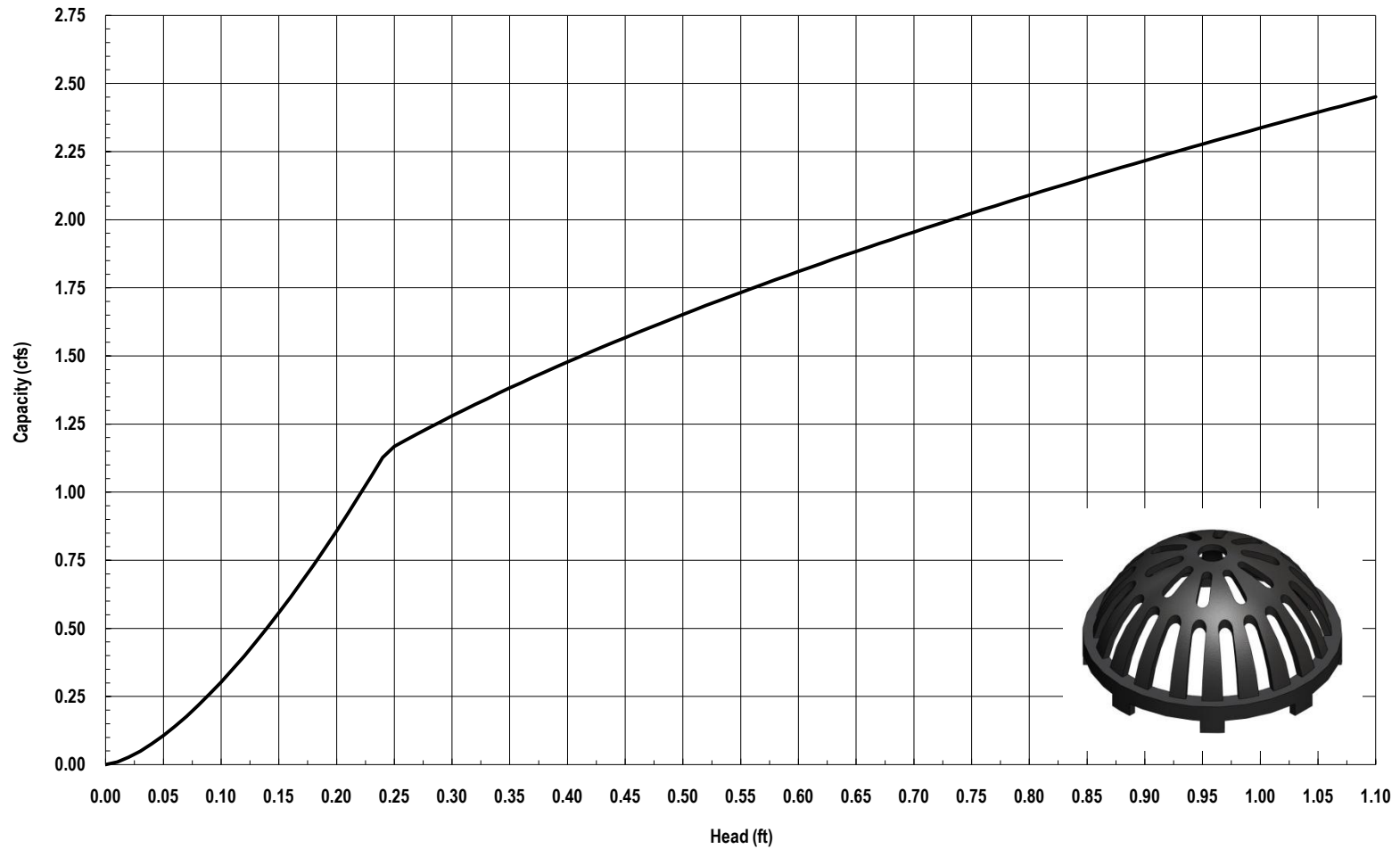
TIME (MIN) = 275	DISCHARGE (CFS) = 0.9
TIME (MIN) = 280	DISCHARGE (CFS) = 0.8
TIME (MIN) = 285	DISCHARGE (CFS) = 0.7
TIME (MIN) = 290	DISCHARGE (CFS) = 0.7
TIME (MIN) = 295	DISCHARGE (CFS) = 0.6
TIME (MIN) = 300	DISCHARGE (CFS) = 0.6
TIME (MIN) = 305	DISCHARGE (CFS) = 0.6
TIME (MIN) = 310	DISCHARGE (CFS) = 0.5
TIME (MIN) = 315	DISCHARGE (CFS) = 0.5
TIME (MIN) = 320	DISCHARGE (CFS) = 0.5
TIME (MIN) = 325	DISCHARGE (CFS) = 0.5
TIME (MIN) = 330	DISCHARGE (CFS) = 0.5
TIME (MIN) = 335	DISCHARGE (CFS) = 0.4
TIME (MIN) = 340	DISCHARGE (CFS) = 0.4
TIME (MIN) = 345	DISCHARGE (CFS) = 0.4
TIME (MIN) = 350	DISCHARGE (CFS) = 0.4
TIME (MIN) = 355	DISCHARGE (CFS) = 0.4
TIME (MIN) = 360	DISCHARGE (CFS) = 0.4
TIME (MIN) = 365	DISCHARGE (CFS) = 0

RUN DATE 6/15/2026
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.8 INCHES
BASIN AREA 2.09 ACRES
RUNOFF COEFFICIENT 0.78
PEAK DISCHARGE 11.6 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.3
TIME (MIN) = 10	DISCHARGE (CFS) = 0.3
TIME (MIN) = 15	DISCHARGE (CFS) = 0.3
TIME (MIN) = 20	DISCHARGE (CFS) = 0.3
TIME (MIN) = 25	DISCHARGE (CFS) = 0.3
TIME (MIN) = 30	DISCHARGE (CFS) = 0.3
TIME (MIN) = 35	DISCHARGE (CFS) = 0.3
TIME (MIN) = 40	DISCHARGE (CFS) = 0.3
TIME (MIN) = 45	DISCHARGE (CFS) = 0.3
TIME (MIN) = 50	DISCHARGE (CFS) = 0.3
TIME (MIN) = 55	DISCHARGE (CFS) = 0.3
TIME (MIN) = 60	DISCHARGE (CFS) = 0.3
TIME (MIN) = 65	DISCHARGE (CFS) = 0.3
TIME (MIN) = 70	DISCHARGE (CFS) = 0.3
TIME (MIN) = 75	DISCHARGE (CFS) = 0.3
TIME (MIN) = 80	DISCHARGE (CFS) = 0.3
TIME (MIN) = 85	DISCHARGE (CFS) = 0.4
TIME (MIN) = 90	DISCHARGE (CFS) = 0.4
TIME (MIN) = 95	DISCHARGE (CFS) = 0.4
TIME (MIN) = 100	DISCHARGE (CFS) = 0.4
TIME (MIN) = 105	DISCHARGE (CFS) = 0.4
TIME (MIN) = 110	DISCHARGE (CFS) = 0.4
TIME (MIN) = 115	DISCHARGE (CFS) = 0.4
TIME (MIN) = 120	DISCHARGE (CFS) = 0.4
TIME (MIN) = 125	DISCHARGE (CFS) = 0.4
TIME (MIN) = 130	DISCHARGE (CFS) = 0.4
TIME (MIN) = 135	DISCHARGE (CFS) = 0.5
TIME (MIN) = 140	DISCHARGE (CFS) = 0.5
TIME (MIN) = 145	DISCHARGE (CFS) = 0.5
TIME (MIN) = 150	DISCHARGE (CFS) = 0.5
TIME (MIN) = 155	DISCHARGE (CFS) = 0.5
TIME (MIN) = 160	DISCHARGE (CFS) = 0.5
TIME (MIN) = 165	DISCHARGE (CFS) = 0.6
TIME (MIN) = 170	DISCHARGE (CFS) = 0.6
TIME (MIN) = 175	DISCHARGE (CFS) = 0.6
TIME (MIN) = 180	DISCHARGE (CFS) = 0.6
TIME (MIN) = 185	DISCHARGE (CFS) = 0.7
TIME (MIN) = 190	DISCHARGE (CFS) = 0.7
TIME (MIN) = 195	DISCHARGE (CFS) = 0.8
TIME (MIN) = 200	DISCHARGE (CFS) = 0.8
TIME (MIN) = 205	DISCHARGE (CFS) = 0.9
TIME (MIN) = 210	DISCHARGE (CFS) = 0.9
TIME (MIN) = 215	DISCHARGE (CFS) = 1.1
TIME (MIN) = 220	DISCHARGE (CFS) = 1.2
TIME (MIN) = 225	DISCHARGE (CFS) = 1.4
TIME (MIN) = 230	DISCHARGE (CFS) = 1.6
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TIME (MIN) = 240	DISCHARGE (CFS) = 3.8
TIME (MIN) = 245	DISCHARGE (CFS) = 11.6
TIME (MIN) = 250	DISCHARGE (CFS) = 1.9
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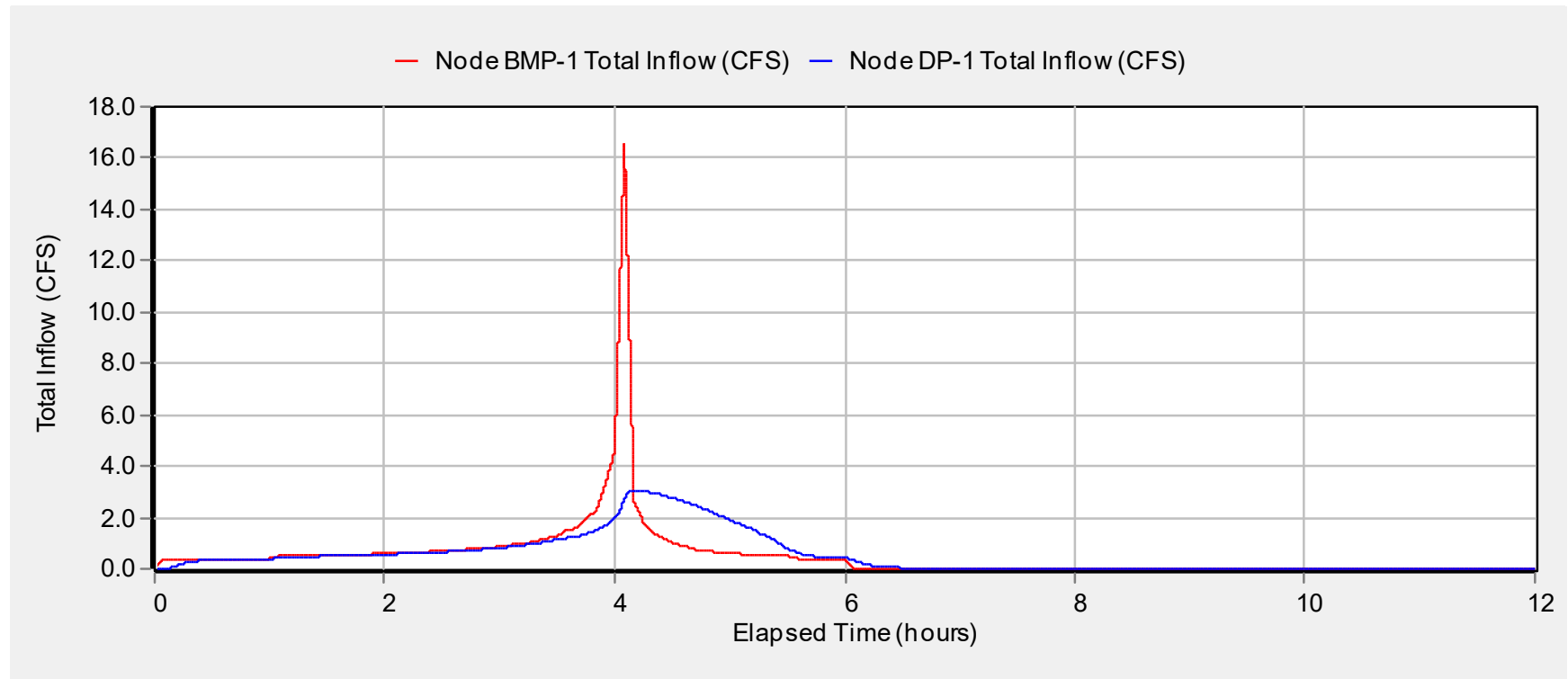
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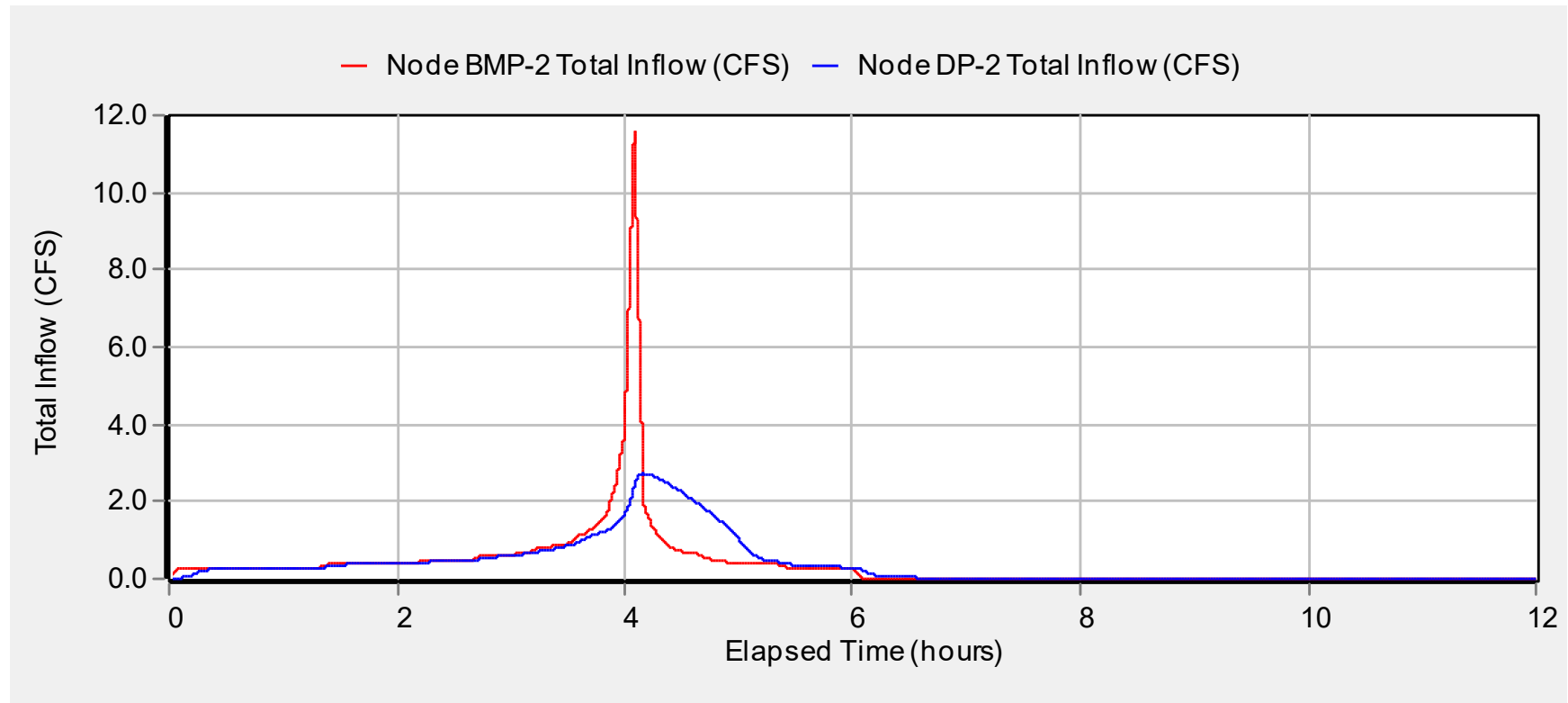
Nyloplast 12" Dome Grate Inlet Capacity Chart



Nyloplast®

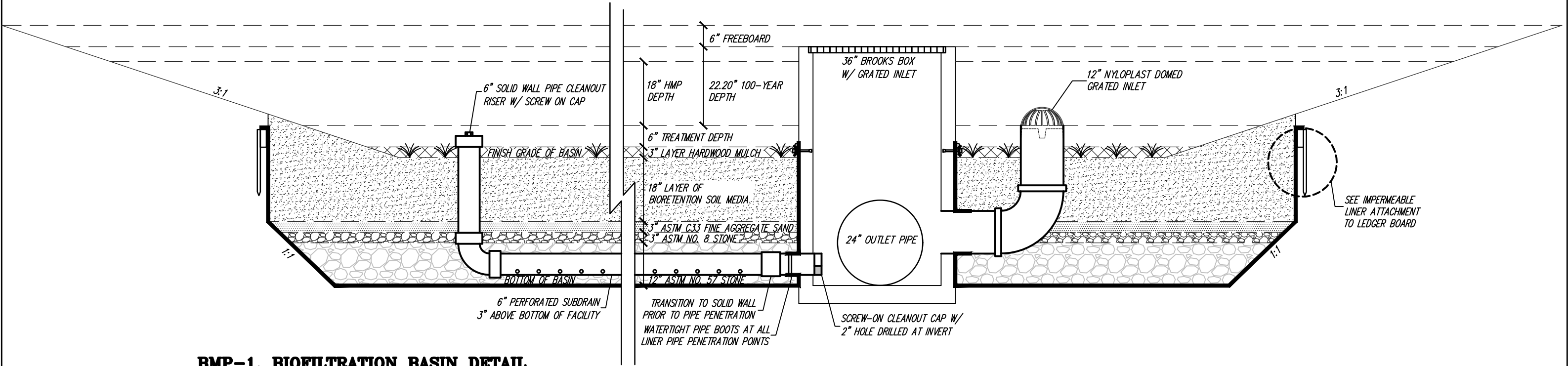
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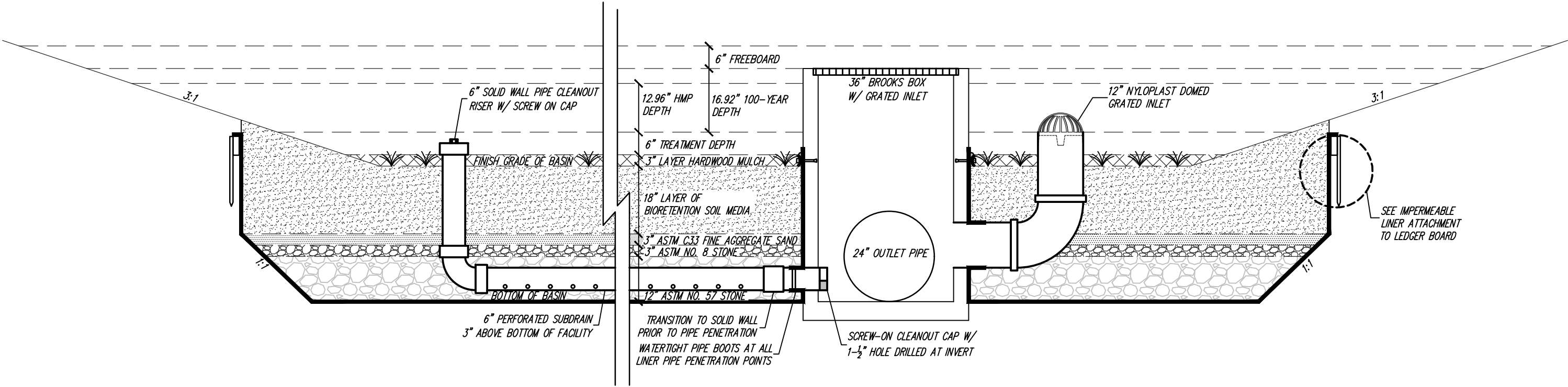


Appendix 12

BMP DETAILS



NOT TO SCALE



NOT TO SCALE

Appendix 13



PRELIMINARY GEOTECHNICAL INVESTIGATION

**1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA**

JUNE 5, 2024

PROJECT NO. G3322-42-01

PREPARED FOR:

**BOULDER RIDGE CAPITAL
CARLSBAD, CALIFORNIA**



Project No. G3322-42-01
June 5, 2024

Boulder Ridge Capital
3220 Grey Hawk Court
Carlsbad, California 92010

Attention: Mr. Andrew Bertha

Subject: PRELIMINARY GEOTECHNICAL INVESTIGATION
1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA

Dear Mr. Bertha:

In accordance with your request and authorization of our proposal (SD-24-0806-P-GT dated April 23, 2024), we herein submit the results of our preliminary geotechnical investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions, potential geologic hazards, and to assist in the design of the proposed improvements.

The accompanying report contains the results of our study with conclusions and recommendations pertinent to the geotechnical aspects of the proposed project. The site is suitable for the proposed self-storage facility provided that the recommendations presented in this report are incorporated into the design and construction of the planned project.

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

Very truly yours,

GEOCON INCORPORATED

Lilian E. Rodriguez
RCE 83227



LER:RCM:RSA:arm

(e-mail) Addressee

Rodney C. Mikesell
GE 2533



Rupert S. Adams
CEG 2561

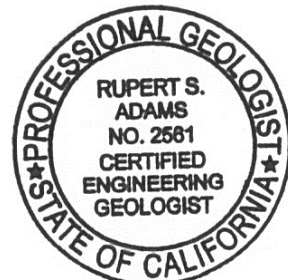


TABLE OF CONTENTS

1.	PURPOSE AND SCOPE.....	1
2.	SITE AND PROJECT DESCRIPTION	2
3.	SOIL AND GEOLOGIC CONDITIONS.....	2
3.1	Undocumented Fill (Qudf)	3
3.2	Topsoil (unmapped).....	3
3.3	Alluvium (Qal)	3
3.4	Granitic Rock (Kgr)	3
4.	GROUNDWATER.....	4
5.	GEOLOGIC HAZARDS	4
5.1	Ground Rupture.....	4
5.2	Seismicity	4
5.3	Liquefaction	4
5.4	Tsunamis, and Seiches	5
5.5	Landslides	5
5.6	Flooding	5
6.	ROCK RIPPABILITY	5
6.1	General	5
7.	CONCLUSIONS AND RECOMMENDATIONS	6
7.1	General	6
7.2	Excavation and Soil Characteristics	6
7.3	Subdrains	7
7.4	Preliminary Grading Recommendations.....	7
7.5	Excavation Slopes and Shoring	9
7.6	Seismic Design Criteria – 2022 California Building Code	9
7.7	Preliminary Shallow Foundation Recommendations	11
7.8	Interior Concrete Slabs on Grade	12
7.9	Exterior Concrete Flatwork.....	14
7.10	Preliminary Retaining Wall Recommendations.....	15
7.11	Lateral Loading	18
7.12	Site Drainage and Moisture Protection	19
7.13	Future Geotechnical Investigation.....	20

LIMITATIONS AND UNIFORMITY OF CONDITIONS

MAPS AND ILLUSTRATIONS

Figure 1, Geologic Map

APPENDIX A

FIELD INVESTIGATION

APPENDIX B

LABORATORY TESTING

APPENDIX C

STORMWATER MANAGEMENT INVESTIGATION

APPENDIX D

RECOMMENDED GRADING SPECIFICATIONS

LIST OF REFERENCES

PRELIMINARY GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report contains the results of our preliminary geotechnical investigation for a proposed self-storage facility located at 1305 East Mission Road in Fallbrook, California (see Site Location Map).



Site Location Map

The purpose of the investigation is to evaluate surface and subsurface soil conditions and general site geology, and to identify geotechnical constraints that could affect construction of the improvements including faulting, liquefaction, and seismic shaking based on the 2022 CBC seismic design criteria. We are providing preliminary recommendations for remedial grading, shallow foundations, concrete slab-on-grade, concrete flatwork, and retaining walls.

The scope of this investigation included our review of readily available, pertinent geologic literature; field work; performing engineering analyses; and preparing this report.

Field work consisted of excavating 19 exploratory trenches to a maximum depth of about 13 feet; sampling soil; and performing laboratory tests on selected soil samples. Appendix A contains the trench logs and details of the field investigation. The details of the laboratory testing and a summary of the test results are shown in Appendix B and on the boring logs in Appendix A. A storm water management investigation is presented in Appendix C.

The recommendations presented herein are based on our analysis of data and our observations obtained during a previous investigation and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

The rectangular approximately 5-acre property is currently undeveloped and is occupied by grasses, trees, end-dumped piles of trash, and old farming tracks. The site is bounded by residential lots and open space to the north and south, a commercial development to the west, and SDGE facilities to the east and west. Review of historical aerial photographs indicates that the property was used for agricultural purposes, and that several farm or residential buildings were demolished circa 2020. Site topography slopes northwards with elevations ranging from approximately 761 to 804 feet mean sea level (MSL).

Grading and building plans are not yet available; however, based on discussions with you, we understand that the development will consist of a series of prefabricated, single-story, steel framed, storage buildings, with associated utility and surface improvements. Stormwater management devices are also planned.

The locations, site descriptions, and proposed development are based on our site reconnaissance, review of published geologic literature, the previous field investigation, and discussions with project personnel. If development plans differ from those described herein, we should be contacted to review the final plan and possibly provide revisions to the recommendations presented in this report.

3. SOIL AND GEOLOGIC CONDITIONS

We encountered undocumented fill, topsoil, alluvium and granitic rock in our exploratory trenches. The occurrence, distribution, and description of each unit encountered is shown on the Geologic Map, Figure 1 and on the trench logs in Appendix A. The units are described below.

3.1 Undocumented Fill (Qudf)

Undocumented fill was encountered in trenches T-2, T-3, T-9 and T-11 to depths ranging from 1.5 to 5 feet below existing grade. The fill is likely associated with previous site development and generally consisted of loose to medium dense, silty and clayey sand. Various end-dumped piles of trash and landscaping debris are also present across the site. The fill is unsuitable to support the planned improvements and will require remedial grading. This soil may be reused as fill provided debris is removed.

3.2 Topsoil (unmapped)

Topsoil was encountered at grade or below undocumented fill in trenches T-1, T-4 through T-8, T-10, T-11 and T-16 to depths ranging from approximately 1.5 to 4 feet below existing grades. The topsoil encountered consisted of loose, silty sand and stiff, sandy clay. The topsoil is not suitable to support settlement sensitive improvements and should be removed and replaced with properly compacted fill within structural improvement areas. The topsoil can be reused as fill during grading operations provided it is free of roots and debris.

3.3 Alluvium (Qal)

Alluvium was observed at grade in trenches T-12 through T-15, and T-17 through T-19 at the north end of the site to depths ranging from 5.5 to greatest depth explored of 13 feet. The alluvium generally consisted of loose to medium dense, silty to clayey sand, and soft to stiff sandy clay and silt. The alluvium is not suitable to support settlement sensitive improvements and should be removed and replaced with properly compacted fill within structural improvement areas, where practical. Due to depth of the alluvium and presence of groundwater, we expect the removals of alluvium will be limited in some areas, and potentially compressible alluvium may be left in place after grading. Additional evaluation of the alluvium may be warranted based on our review of the site development plan.

3.4 Granitic Rock (Kgr)

We encountered Cretaceous-age granitic rock (mapped as undivided tonalite [Kt] in Kennedy and Tan, 2007) below undocumented fill, topsoil and alluvium. The granitic rock encountered consisted of weak, completely to highly weathered rock, and likely possesses a “very low” to “low” expansion index (expansion index of 50 or less). Buried corestones and zones of strong rock are possible during grading and construction operations, if excavations extend into granitic rock. The granitic rock is suitable to support proposed fill and structural loads.

4. GROUNDWATER

Groundwater was encountered in trench T-18 at a depth of approximately 12.5 feet below existing grade. It is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater and seepage conditions are dependent on seasonal precipitation, irrigation, land use, among other factors, and vary as a result. Proper surface drainage will be important to future performance of the project. Groundwater may be encountered during site grading.

5. GEOLOGIC HAZARDS

5.1 Ground Rupture

The USGS (2016) and Kennedy & Tan (2007) show that there are no mapped Quaternary faults crossing or trending toward the site. The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone (CEG, 2021a). The closest active fault is the Newport-Inglewood-Rose Canyon fault zone located approximately 4.5 miles to the west. The risk associated with ground rupture hazard is low.

There are no active faults, potentially active faults, inactive faults, presumed inactive faults, or activity unknown faults at the site or trending toward the site. The risk associated with ground rupture hazard is low

5.2 Seismicity

Considerations important in seismic design include frequency and duration of motion and soil conditions underlying the site. The seismic design of structures should be evaluated in accordance with the 2022 California Building Code currently adopted by the local agency. The risk associated with strong seismic ground motion hazard is high; however, the risk is no greater than that for the site vicinity.

5.3 Liquefaction

Considering the undocumented fill and alluvium will be removed and replaced as compacted fill, and the density and age of the underlying geologic units, the risk associated with seismically induced soil liquefaction hazard is low.

5.4 Tsunamis, and Seiches

The site is not located within a California Tsunami Hazard Area (CGS, 2021b). There are no lakes or reservoirs located near the site. The risk associated with inundation hazard due to tsunami or seiche is low.

5.5 Landslides

No evidence of landsliding was observed during our investigation. Kennedy & Tan (2007) show that there are no landslides mapped at the site or in an area that could impact the site. The risk associated with ground movement hazard due to landsliding is low.

5.6 Flooding

The site is not mapped in a Special Flood Hazard Area as defined by FEMA (2019). The risk of inundation hazard due to flooding is low.

6. ROCK RIPPABILITY

6.1 General

Evaluation of rock rippability was not part of this study. Based on our experience during grading and utility installation on projects underlain by granitic rock, and the degree of weathering observed at the site, granitic rock encountered during grading should be rippable to a depth of approximately five feet below the bottom of exploratory test pits (Appendix A) using a D-9 Caterpillar Tractor equipped with a single shank hydraulic ripper, or a Caterpillar 345/365 excavator. We did not observe oversize rock (greater than 12-inches in dimension) in test pit spoil piles; therefore we do not anticipate generation of large quantities of oversize rock during site grading.

Further evaluation of rippability using seismic refraction lines, air track borings, or test excavations using a Caterpillar 345/365 excavator, may be necessary, depending planned site grades and the depth of utility installation.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

- 7.1.1 It is our opinion that the site is suitable for the planned improvements, provided the recommendations presented herein are implemented during the design and construction of the project.
- 7.1.2 The site is underlain by undocumented fill, topsoil and alluvium overlying granitic rock. The fill, topsoil and alluvium are not suitable to support settlement-sensitive improvements and will require remedial grading. The granitic rock is suitable to support compacted fill and settlement-sensitive improvements.
- 7.1.3 Groundwater was encountered at a depth of 12.5 feet in trench T-12 located in the north end of the site. Groundwater and seepage could be encountered during the grading operations, especially during the rainy seasons.
- 7.1.4 No significant geologic hazards were observed or are known to exist on the site that would adversely impact the site.
- 7.1.5 The proposed structures can be supported on conventional shallow foundations bearing entirely on undisturbed granitic rock or entirely on compacted fill.

7.2 Excavation and Soil Characteristics

- 7.2.1 Excavation of the in-situ soil should be possible with moderate to heavy effort using conventional heavy-duty equipment. Excavation of the granitic rock will require very heavy effort and may generate minor amounts of oversized rock (rocks greater than 12 inches in dimension). Oversize rock, if present, can be buried onsite in accordance with guidelines provided in Appendix D. The grading and improvement contractors should review this report and evaluate the proper equipment to use for the planned excavations.
- 7.2.2 The soil encountered in the field investigation is considered “expansive” (EI of greater than 20) as defined by 2022 California Building Code (CBC) Section 1803.5.3. We expect most of the soil encountered possess a “very low” to “medium” expansion potential (EI of 90 or less) in accordance with ASTM D 4829. The following table presents soil classifications based on the expansion index.

EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	ASTM D 4829 Expansion Classification	2022 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

7.2.3 Laboratory tests were performed on a sample of the site soil to evaluate the percentage of water-soluble sulfate content. Appendix A presents test results, which indicate the on-site soils at the locations tested possess “S0” sulfate exposure to concrete structures as defined by 2022 CBC Section 1904 and ACI 318. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations. Over time, landscaping activities (i.e., addition of fertilizers and other additives) may affect the water-soluble sulfate concentration.

7.2.4 Geocon Incorporated does not practice in the field of corrosion engineering; therefore, further evaluation by a corrosion engineer may be needed if improvements susceptible to corrosion are planned.

7.3 Subdrains

7.3.1 Subdrains will not be required for this project.

7.4 Preliminary Grading Recommendations

7.4.1 Grading should be performed in accordance with the recommendations provided in this report, the *Recommended Grading Specifications* contained in Appendix D and the local Grading Ordinances. Where the recommendations of this report conflict with Appendix D, the recommendations of this section take precedence.

7.4.2 Earthwork should be observed, and compacted fill tested by Geocon Incorporated.

7.4.3 A preconstruction conference should be held at the site with the City representative, owner, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and the grading plans can be discussed at that time.

- 7.4.4 Site preparation should begin with the removal of deleterious material, debris, and vegetation. Material generated during stripping and demolition should be exported from the site and should not be mixed with the fill soil. Existing building foundations and underground improvements within the proposed building area should be removed.
- 7.4.5 Abandoned foundations and buried utilities should be removed and the resulting depressions or trenches backfilled with properly compacted soil as part of the remedial grading.
- 7.4.6 We recommend surficial soil (undocumented fill, topsoil and alluvium) within areas of planned grading be removed to expose the underlying granitic rock and properly compacted prior to placing additional fill and/or structural loads. Overly wet soils, might be encountered near the groundwater table. These soils may require drying and/or mixing with drier soils to facilitate proper compaction.
- 7.4.7 Depending on final development plans and the magnitude of settlement structures can accommodate, partial removal of alluvium may be feasible. Once development plans are prepared, we should review the plans and provide, if warranted, revised recommendations based on discussions with project personnel and the structural engineer.
- 7.4.8 Where grading results in a cut to fill transition within planned building pads, the cut portion of the pad should be undercut at least 3 feet or 1 foot below the deepest footing (whichever is deeper) and replaced with properly compacted “very low” to “medium” expansive soil. The base of the undercuts should be sloped towards the deeper fill area on the pad. The undercut should extend to at least 5 feet beyond the building footprint, where practical. As an alternative to undercutting cut to fill transitions, the footings can be deepened to extend through the fill to bear on the underlying granitic rock.
- 7.4.9 Prior to placing fill, the ground surface should be scarified to a depth of at least 12 inches, moisture conditioned, and compacted. Fill soils should then be placed and compacted in layers to the design finish-grade elevation. The fill layers should be no thicker than will allow for adequate bonding and compaction. Fill (including scarified ground surfaces) should be compacted to at least 90 percent of maximum dry density (as determined by ASTM D 1557) at or slightly above optimum moisture content.

- 7.4.10 Imported soil should have the characteristics presented in the following table. We should be notified of the imported soil source and should be provided with samples in order to perform testing of imported soil prior to its arrival at the site to evaluate its suitability as fill material.

SUMMARY OF IMPORT FILL RECOMMENDATIONS

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

7.5 Excavation Slopes and Shoring

- 7.5.1 The recommendations included herein are provided for stable excavations. Geocon Incorporated is not responsible for site safety and the stability of the proposed excavations. It is the contractor's responsibility to ensure that all excavations, temporary slopes, and trenches are properly constructed and maintained in accordance with applicable OSHA guidelines in order to maintain the safety and stability of the excavations and adjacent improvements. The walls of the excavations should not be allowed to become saturated or to dry out. Surcharge loads should not be permitted to a distance equal to the height of the excavation from the top of the excavation unless the shoring system is designed to accommodate the surcharge loading. The top of sloped excavations should be a minimum of 15 feet from the edge of existing improvements. Vertical excavations should be shored in accordance with applicable OSHA codes and regulations.

7.6 Seismic Design Criteria – 2022 California Building Code

- 7.6.1 The following table summarizes site-specific design criteria obtained from the 2022 California Building Code (CBC; Based on the 2021 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used SEAOC (2020) to calculate the seismic design parameters. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2022 CBC and Table 20.3-1 of ASCE 7-16. The values presented herein are for the risk-targeted maximum considered earthquake (MCE_R).

2022 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2022 CBC Reference
Site Class	C	Section 1613.2.2
MCE _R Ground Motion Spectral Response Acceleration – Class B (short), S_s	1.066g	Figure 1613.2.1(1)
MCE _R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.388g	Figure 1613.2.1(2)
Site Coefficient, F_A	1.2	Table 1613.2.3(1)
Site Coefficient, F_V	1.5	Table 1613.2.3(2)
Site Class Modified MCE _R Spectral Response Acceleration (short), S_{MS}	1.279g	Section 1613.2.3 (Eqn 16-36)
Site Class Modified MCE _R Spectral Response Acceleration – (1 sec), S_{M1}	0.582	Section 1613.2.3 (Eqn 16-37)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.853g	Section 1613.2.4 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.388g	Section 1613.2.4 (Eqn 16-39)

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

ASCE 7-16 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-16 Reference
Site Class	C	Section 1613.2.2 (2022 CBC)
Mapped MCE _G Peak Ground Acceleration, PGA	0.459g	Figure 22-7
Site Coefficient, F_{PGA}	1.2	Table 11.8-1
Site Class Modified MCE _G Peak Ground Acceleration, PGA_M	0.551g	Section 11.8.3 (Eqn 11.8-1)

7.6.3 Conformance to the seismic design criteria presented in the above tables does not constitute a guarantee or assurance that significant structural damage or ground failure will not occur in the event of a large earthquake. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

7.6.4 The project structural engineer or architect should determine the appropriate Risk Category and Seismic Design Category for the planned structures. The values presented herein

assume a Risk Category of II resulting in a Seismic Design Category D. The following table presents a summary of the risk categories in accordance with ASCE 7-16.

ASCE 7-16 RISK CATEGORIES

Risk Category	Building Use	Examples
I	Low risk to Human Life at Failure	Barn, Storage Shelter
II	Nominal Risk to Human Life at Failure (Buildings Not Designated as I, III or IV)	Residential, Commercial and Industrial Buildings
III	Substantial Risk Human Life at Failure	Theaters, Lecture Halls, Dining Halls, Schools, Prisons, Small Healthcare Facilities, Infrastructure Plants, Storage for Explosives/Toxins
IV	Essential Facilities	Hazardous Material Facilities, Hospitals, Fire and Rescue, Emergency Shelters, Police Stations, Power Stations, Aviation Control Facilities, National Defense, Water Storage

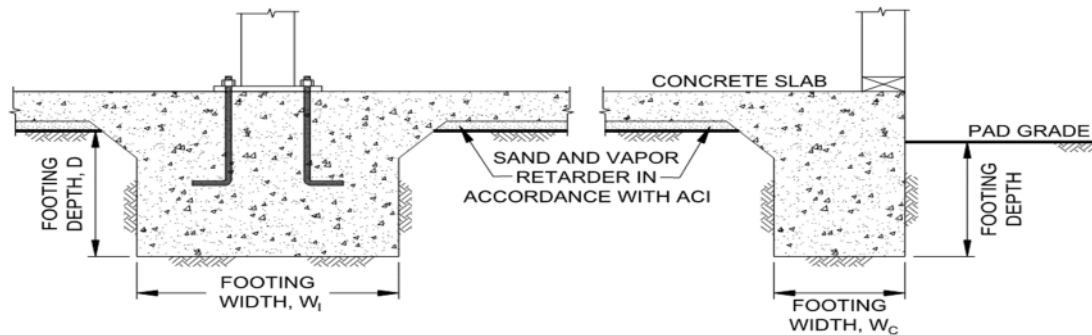
7.7 Preliminary Shallow Foundation Recommendations

7.7.1 The proposed structures can be supported on a shallow foundation system founded entirely on granitic rock or entirely on properly compacted fill. Foundations for the structures should consist of continuous strip footings or isolated spread footings. The table below provides a summary of the foundation design recommendations.

SUMMARY OF FOUNDATION RECOMMENDATIONS

Parameter	Value
Minimum Continuous Foundation Width, W_c	12 inches
Minimum Isolated Foundation Width, W_i	24 inches
Minimum Foundation Depth, D	24 Inches Below Lowest Adjacent Grade
Minimum Concrete Reinforcement	4 No. 5 Bars, 2 at the Top and 2 at the Bottom
Allowable Bearing Capacity (Compacted Fill)	2,500 psf
Allowable Bearing Capacity (Granitic Rock)	8,000 psf
Bearing Capacity Increase	500 psf per Foot of Depth
	300 psf per Foot of Width
Maximum Allowable Bearing Capacity (Compacted fill)	4,000 psf
Maximum Allowable Bearing Capacity (Granitic Rock)	10,000 psf
Estimated Total Settlement	TBD
Estimated Differential Settlement	TBD
Design Expansion Index	90 or less

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



Wall/Column Footing Dimension Detail

- 7.7.3 The bearing capacity values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces.
- 7.7.4 We should observe the foundation excavations prior to the placement of reinforcing steel and concrete to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.
- 7.7.5 We should be consulted to provide additional design parameters as required by the structural engineer.

7.8 Interior Concrete Slabs on Grade

- 7.8.1 Interior concrete slabs on grade for the structure should be constructed in accordance with the following table.

MINIMUM INTERIOR CONCRETE SLAB-ON-GRADE RECOMMENDATIONS

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

- 7.8.2 A vapor retarder should underlie slabs that receive moisture-sensitive floor coverings or could be used to store moisture-sensitive materials. The vapor retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The vapor retarder should be installed in a manner that prevents puncture in accordance with manufacturer's requirements and ASTM recommendations. The project architect or developer should specify the vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.
- 7.8.3 The project foundation engineer, architect, or developer should determine the bedding sand thickness. It is common to have 3 to 4 inches of sand in the southern California region. We should be contacted to provide recommendations if the bedding sand is thicker than 6 inches.
- 7.8.4 The foundation-design engineer should provide appropriate concrete-mix-design criteria and curing measures to assure proper curing of the slab including reducing potential rapid moisture loss which could result in shrinkage cracking and slab curl.
- 7.8.5 The foundation-design engineer should present the concrete-mix design and proper concrete-curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.
- 7.8.6 Concrete slabs should be provided with adequate crack-control joints, construction joints and expansion joints to reduce concrete-shrinkage cracking. The American Concrete Institute (ACI) criteria should be used when establishing crack-control spacing. Crack-control joints should be spaced at intervals no greater than 12 feet. Additional concrete reinforcement, concrete admixtures or closer crack control joint spacing should be considered where exposed-concrete finished floors are planned.

- 7.8.7 Subgrade presaturation prior to placing concrete is not deemed necessary; however, the subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.
- 7.8.8 The concrete-slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting expected loads.
- 7.8.9 The recommendations of this report are intended to reduce potential cracking of slabs due to expansive soil, differential settlement of existing soil or soil with varying thicknesses. Even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade placed on such conditions may still exhibit cracking due to soil movement and/or shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

7.9 Exterior Concrete Flatwork

- 7.9.1 Exterior concrete flatwork not subject to vehicular traffic should be constructed in accordance with the recommendations presented in the following table. The recommended reinforcing steel could help reduce potential cracking.

MINIMUM CONCRETE FLATWORK RECOMMENDATIONS

Expansion Index, EI	Minimum Concrete Reinforcement* Options	Minimum Thickness
EI ≤ 90	6x6-W2.9/W2.9 (6x6-6/6) welded wire mesh	4 Inches
	No. 3 Bars 24 inches on center, Both Directions	

*In excess of 8 feet square.

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

- 7.9.3 Even with the incorporation of the recommendations presented in this report, the exterior concrete flatwork can experience differential movement. Flatwork should be structurally connected to the curbs, where practical, to reduce potential offset between the curb and the flatwork.
- 7.9.4 Concrete flatwork should be provided with crack-control joints. The project structural engineer should determine the spacing of the crack-control joints based on the slab thickness and the intended use. American Concrete Institute (ACI) criteria should be used when establishing crack control spacing.
- 7.9.5 Subgrade soil for exterior slabs that are not subjected to vehicle loads should be compacted in accordance with criteria presented in the grading section prior section of this report. Subgrade soil should be properly compacted, and the moisture content of subgrade soil should be verified prior to placing concrete.
- 7.9.6 Where exterior flatwork abuts the structure at entrance or exit points, the exterior slab should be dowelled into the foundation stem wall. This recommendation is intended to reduce potential differential elevations that could result from differential settlement or minor heave of the flatwork. The project structural engineer should provide dowelling details.
- 7.9.7 The recommendations presented herein are intended to reduce potential cracking of exterior slabs resulting from differential movement; however, even with the incorporation of the recommendations presented herein, slabs-on-grade could still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be controlled by limiting the slump of the concrete; the use of crack control joints; and proper concrete placement and curing. Crack control joints should be spaced at intervals no greater than 12 feet. The Portland Concrete Association (PCA) and American Concrete Institute (ACI) provide recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

7.10 Preliminary Retaining Wall Recommendations

- 7.10.1 Walls that are allowed to rotate more than $0.001H$ (where H equals the height of the retaining portion of the wall) at the top of the wall should be designed using the values

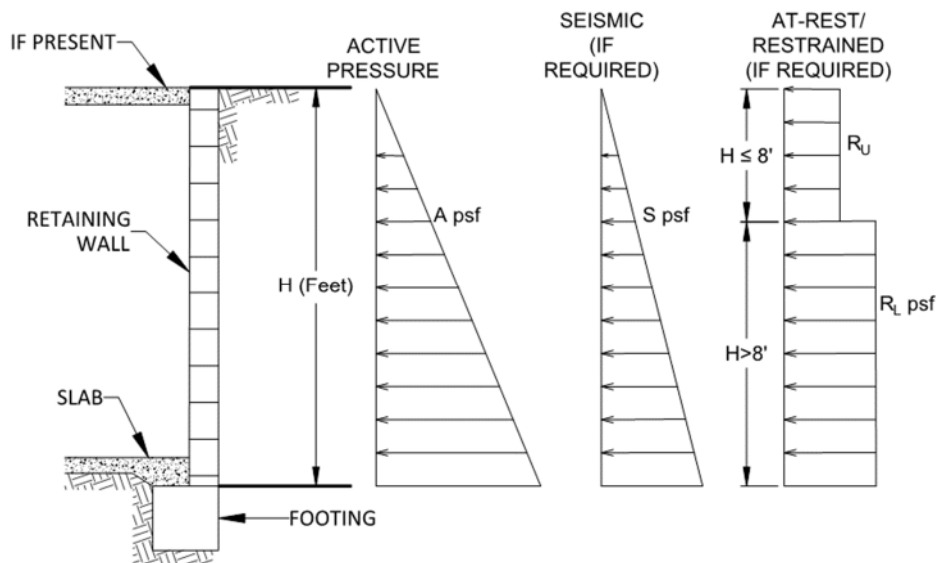
presented in the following table. Soil with an expansion index (EI) greater than 90 should not be used as backfill material behind retaining walls.

RETAINING WALL DESIGN RECOMMENDATIONS

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

H equals the height of the retaining portion of the wall in feet.

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

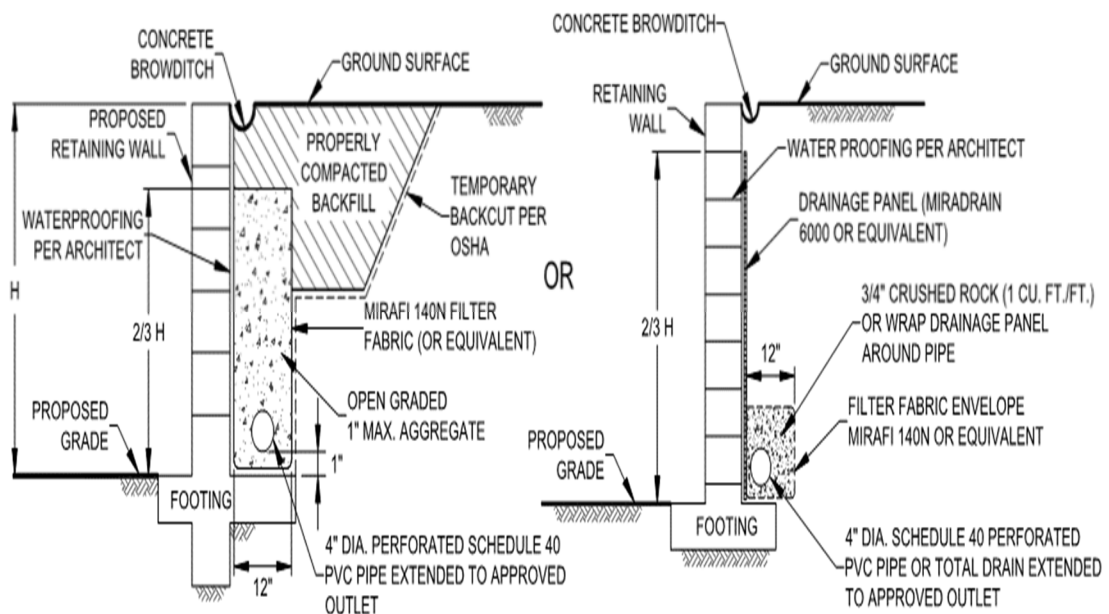


Retaining Wall Loading Diagram

- 7.10.3 Where walls are restrained from movement at the top (at-rest condition), an additional uniform pressure should be applied to the wall.
- 7.10.4 The structural engineer should determine the Seismic Design Category for the project in accordance with Section 1613.3.5 of the 2022 CBC or Section 11.6 of ASCE 7-10. For

structures assigned to Seismic Design Category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 1803.5.12 of the 2022 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall.

- 7.10.5 Retaining walls should be designed to ensure stability against overturning sliding, and excessive foundation pressure. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, it is not necessary to consider active pressure on the keyway.
- 7.10.6 Drainage openings through the base of the wall (weep holes) should not be used where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall.
- 7.10.7 The recommendations herein assume a properly compacted, granular (EI of 50 or less), free-draining backfill soil and that no hydrostatic forces or imposed surcharge load. The retaining wall should be properly drained as shown in the Typical Retaining Wall Drainage Detail. If conditions different than those described are expected, or if specific drainage details are desired, Geocon should be contacted for additional recommendations.



Typical Retaining Wall Drainage Detail

- 7.10.8 In general, wall foundations should be designed in accordance with the following table. The proximity of the foundation to the top of a slope steeper than 3:1 could impact the allowable soil bearing pressure. Therefore, retaining wall foundations should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

SUMMARY OF RETAINING WALL FOUNDATION RECOMMENDATIONS

Parameter	Value
Minimum Retaining Wall Foundation Width	12 inches
Minimum Retaining Wall Foundation Depth	12 Inches
Minimum Concrete Reinforcement	Per Structural Engineer
Allowable Bearing Capacity	2,500 psf
Bearing Capacity Increase	500 psf per Foot of Depth
	300 psf per Foot of Width
Maximum Allowable Bearing Capacity	4,000 psf
Estimated Total Settlement	TBD
Estimated Differential Settlement	TBD

- 7.10.9 The recommendations presented herein are applicable for the design of rigid concrete or masonry retaining walls. Should other types of walls (such as mechanically stabilized earth [MSE] walls) be planned, Geocon should be consulted for additional recommendations.
- 7.10.10 Soil contemplated for use as retaining wall backfill, including imported soils, should be identified in the field prior to backfill. At that time, Geocon should be provided samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength.
- 7.10.11 City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs are used.

7.11 Lateral Loading

- 7.11.1 The following table provides design parameters to resist lateral loads and for the design of footings or shear keys. The allowable passive pressure assumes a horizontal surface

extending at least 5 feet, or three times the surface generating the passive pressure, whichever is greater. The upper 12 inches of soil in areas not covered by floor slabs or pavement should not be included in the determination of passive resistance.

SUMMARY OF LATERAL LOAD DESIGN RECOMMENDATIONS

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

*Per manufacturer's recommendations.

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

7.12 Site Drainage and Moisture Protection

- 7.12.1 Adequate site drainage is critical to reduce the risk for differential soil movement, erosion, and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2022 CBC 1804.4. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.
- 7.12.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints, and a Miradrain drainage panel (or similar) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.
- 7.12.3 Underground utilities should be leak free. Utility and irrigation lines should be checked at appropriate intervals for leaks. Detected leaks should be promptly repaired. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

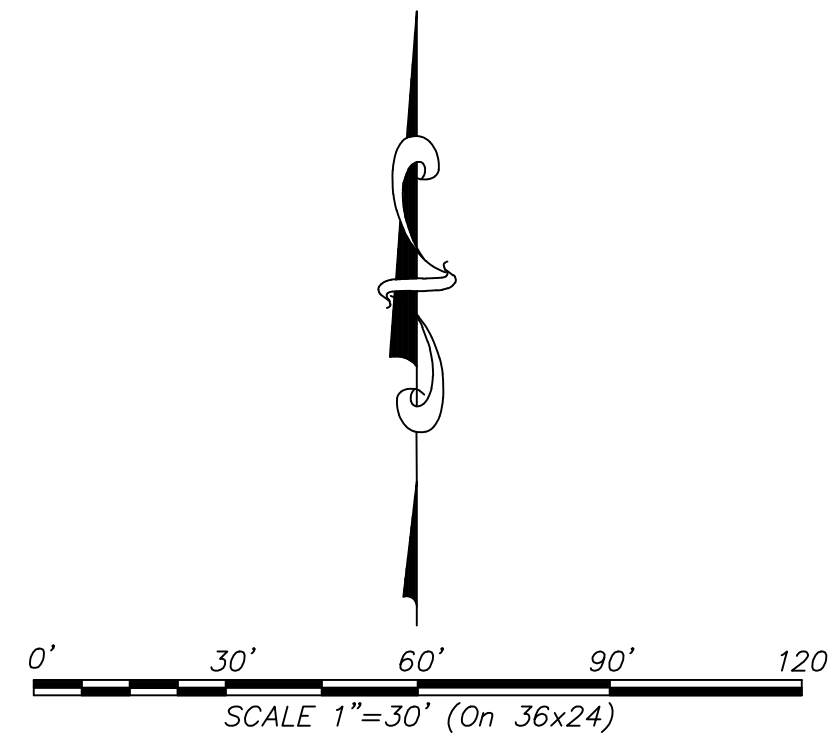
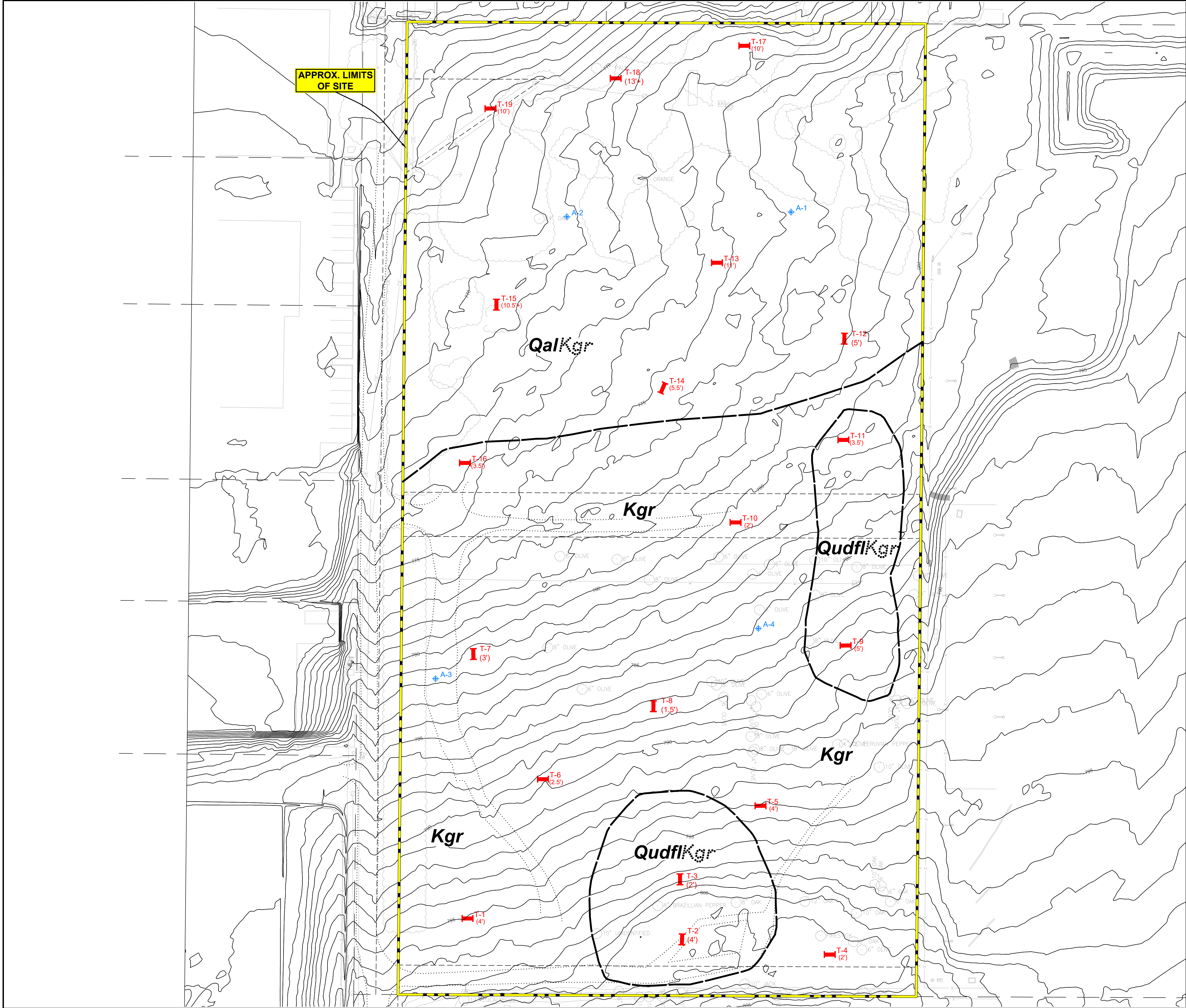
- 7.12.4 Landscaping planters adjacent to paved areas are not recommended due to the risk for surface or irrigation water to infiltrate the pavement subgrade and base course. Area drains to collect excess irrigation water and transmit it to drainage structures, or impervious above-grade planter boxes should be used. A cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material should be considered where landscaping is planned next to pavement.
- 7.12.5 We have prepared a storm water management investigation and it is included in Appendix C herein.

7.13 Future Geotechnical Investigation

- 7.13.1 We recommend performing additional field work in areas of the site where alluvium is present, and buildings are planned. The field investigation would consist of sampling the soil conditions during excavation of the test borings, examining the soil conditions encountered, and evaluating the depth of surficial soils and groundwater.
- 7.13.2 Laboratory tests should be performed on selected soil samples to evaluate shear strength, consolidation, and in-situ dry density and moisture content.
- 7.13.3 We can prepare an updated geotechnical investigation report presenting our findings, conclusions, and recommendations regarding the geotechnical aspects of planned structures, after we receive grading and building plans and perform the additional field investigation. Final foundation and concrete slab on-grade design criteria, 2022 California Building Code seismic design parameters, excavation characteristics, geologic hazard analyses, and remedial grading measures at the site would be included in the report.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.
2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.
3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.
4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



- GEOCON LEGEND**
- UNDOCUMENTED FILL
 - Qudf** ALLUVIUM
 - Qal** GRANITIC ROCK (Dotted Where Buried)
 - Kgr** GRANITIC ROCK (Dotted Where Buried)
 - A-4** APPROX. LOCATION OF INFILTRATION TEST
 - T-19** APPROX. LOCATION OF TRENCH
 - (5)** DEPTH TO GRANITIC ROCK (in Feet)
 - APPROX. LOCATION OF GEOLOGIC CONTACT

GEOLOGIC MAP
1305 E. MISSION ROAD
FALLBROOK, CALIFORNIA

GEOCON INCORPORATED GEO TECHNICAL ■ ENVIRONMENTAL ■ MATERIALS 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974 PHONE 658.558-6900 - FAX 658.558-6159		SCALE 1" = 30'	DATE 06 - 05 - 2024
		PROJECT NO. G3322 - 42 - 01	FIGURE 1
		SHEET 1 OF 1	

APPENDIX

A

APPENDIX A

FIELD INVESTIGATION

We performed the trenching operations on May 6, 2024. The approximate locations of the exploratory trenches are shown on the Geologic Map, Figure 1 and the trench logs are presented in this appendix. The trenches were excavated to a maximum depth of approximately 13 feet below existing grade using a CAT 430F rubber tire backhoe equipped with an 18-inch bucket.

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

PROJECT NAME	E. Mission Road		
PROJECT NUMBER	G3322-42-01		
DATE STARTED	05-06-2024	COMPLETED	05-06-2024
TRENCHING CONTRACTOR	Dave's Backhoe		
EQUIPMENT TYPE	CAT 430F RT Backhoe W/18" Bucket		
LOGGED BY	N. Borja		

LATITUDE	33.384884	LONGITUDE	-117.236147
TRENCH DEPTH	7.0 ft		
TOP OF TRENCH ELEVATION	795.0 ft		

GROUNDWATER DEPTHS

▼ GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION		BLOW COUNTS (Blows per 6")
		CHNK T1-1		SM		TOPSOIL; Loose, moist, dark brown, Silty, fine to medium SAND	
				SC-SM	1.50 793.5	Medium dense, moist, reddish brown, Silty and Clayey, fine to medium SAND	
					3.50 791.5	GRANITIC ROCK (Kgr); Weak, highly weathered, damp, light brown to brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	790	B T1-2			7.00 788.0	TRENCH TERMINATED AT 7 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	785						
15	780						

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



TRENCH NUMBER T-2

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja +N. Borja

LATITUDE 33.384849 LONGITUDE -117.235669
TRENCH DEPTH 7.0 ft
TOP OF TRENCH ELEVATION 800.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
		B T2-1		SM	UNDOCUMENTED FILL (Qudf); Loose, damp, dark grayish brown, Silty, fine to medium SAND	
				2.00 798.0		
				SP-SC	Loose to medium dense, moist, reddish brow, Clayey, fine to coarse SAND; trace gravel	
				4.00 796.0		
5	795				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown to yellowish brown, GRANITIC ROCK; excavates as silty, fine to coarse sand	
				7.00 793.0		
					TRENCH TERMINATED AT 7 FEET No groundwater Backfilled on 05-06-2024.	
10	790					
15	785					

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



TRENCH NUMBER T-3

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.384960 **LONGITUDE** -117.235674
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 798.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	UNDOCUMENTED FILL (Qudf); Loose, damp, dark brown, Silty, fine to medium SAND - -Becomes brown to dark reddish brown	
				2.00 796.0	
				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown to yellowish brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				4.50 793.5	
5	793			TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	788				
15	783				

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



TRENCH NUMBER T-4

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.384823 LONGITUDE -117.235341
TRENCH DEPTH 4.0 ft
TOP OF TRENCH ELEVATION 801.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
		B T4-1		SM	TOPSOIL; Loose, moist, dark brown, Silty, fine to medium SAND	
				2.00 799.0	GRANITIC ROCK (Kgr); Weak, highly weathered, damp, light brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				4.00 797.0		
5	796				TRENCH TERMINATED AT 4 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	791					
15	786					

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



TRENCH NUMBER T-5

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385099 **LONGITUDE** -117.235498
TRENCH DEPTH 6.0 ft
TOP OF TRENCH ELEVATION 794.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	TOPSOIL ; Loose, moist, dark brown, Silty, fine to medium SAND; trace clay	
			SM	3.00 791.0 Loose to medium dense, damp, dark brown, Silty, fine to coarse SAND	
				4.00 790.0 GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	789			6.00 788.0 TRENCH TERMINATED AT 6 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	784				
15	779				

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



TRENCH NUMBER T-6

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385145 **LONGITUDE** -117.235982
TRENCH DEPTH 4.0 ft
TOP OF TRENCH ELEVATION 790.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, dry to damp, dark brown, Silty, fine to medium SAND	
				SM	2.00 788.0 Loose to medium dense, damp, brown to dark brown, Silty, fine to coarse SAND; trace clay	
					2.50 787.5 GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
					4.00 786.0 TRENCH TERMINATED AT 4 FEET No groundwater encountered Backfilled on 05/06/2024.	
5	785					
10	780					
15	775					

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

**TRENCH NUMBER T-7**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385377 **LONGITUDE** -117.236139
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 781.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, moist, dark brown, Silty, fine to medium SAND	
				CL	1.50 779.5 Stiff, moist, dark reddish brown and olive brown, Sandy CLAY	
					3.00 778.0 GRANITIC ROCK (Kgr) ; Weak, highly weathered, brown to light brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
					4.50 776.5 TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
5	776					
10	771					
15	766					

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



TRENCH NUMBER T-8

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385283 **LONGITUDE** -117.235738
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 788.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, damp, brown, Silty, fine to medium SAND	
				1.50 786.5	GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				4.50 783.5		
5 783					TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10 778						
15 773						

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

**TRENCH NUMBER T-9**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385400 **LONGITUDE** -117.235312
TRENCH DEPTH 7.0 ft
TOP OF TRENCH ELEVATION 789.0 ft

GROUNDWATER DEPTHS

▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
5	784	B T9-1		SM	UNDOCUMENTED FILL (Qudf) ; Loose, damp, dark brown, Silty, fine to medium SAND - Contains chunks of granitic rock 5.00 784.0 GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND 7.00 782.0	
10	779				TRENCH TERMINATED AT 7 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	774					

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



PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385627 LONGITUDE -117.235559
TRENCH DEPTH 3.5 ft
TOP OF TRENCH ELEVATION 781.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	TOPSOIL; Loose, damp, brown to dark brown, Silty, fine to coarse SAND; metal pipe encountered below surface	
			2.00 779.0	GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
			3.50 777.5	TRENCH TERMINATED AT 3.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
5	776				
10	771				
15	766				

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

**TRENCH NUMBER T-11**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385783 **LONGITUDE** -117.235321
TRENCH DEPTH 5.5 ft
TOP OF TRENCH ELEVATION 780.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	UNDOCUMENTED FILL (Qudf); Loose, moist, brown to grayish brown, Silty, fine to medium SAND	
	1.50			778.5	
			CL	TOPSOIL; Stiff, moist, dark reddish brown and olive brown, Sandy CLAY	
	3.50			776.5	
				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	775			5.50 774.5	
				TRENCH TERMINATED AT 5.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	770				
15	765				

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

PROJECT NAME	E. Mission Road		
PROJECT NUMBER	G3322-42-01		
DATE STARTED	05-06-2024	COMPLETED	05-06-2024
TRENCHING CONTRACTOR	Dave's Backhoe		
EQUIPMENT TYPE	CAT 430F RT Backhoe W/18" Bucket		
LOGGED BY	N. Borja		

LATITUDE	33.385972	LONGITUDE	-117.235321
TRENCH DEPTH	10.0 ft		
TOP OF TRENCH ELEVATION	778.0 ft		
GROUNDWATER DEPTHS			
▼ GROUNDWATER ENCOUNTERED	NA		

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION		BLOW COUNTS (Blows per 6")
				SM		ALLUVIUM (Qal) ; Loose, dry to damp, brown to light brown, Silty, fine to medium SAND	
				CL	2.00 776.0	Stiff, moist, dark brown and dark grayish brown, Sandy CLAY	
				SM	4.00 774.0	Medium dense, moist, mottled grayish brown and reddish brown, Silty, fine to medium SAND	
5	773				7.00 771.0	GRANITIC ROCK (Kgr) ; Weak, highly weathered, moist, grayish brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
10	768				10.00 768.0	- Hard digging	
						TRENCH TERMINATED AT 10 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	763						

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

**TRENCH NUMBER T-13**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386111 **LONGITUDE** -117.235606
TRENCH DEPTH 12.0 ft
TOP OF TRENCH ELEVATION 775.0 ft

GROUNDWATER DEPTHS

▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			CL	ALLUVIUM (Qal) ; Soft to firm, moist, dark, Sandy CLAY	
			SM-ML	3.00 772.0 Loose, moist, mottled tan brown and gray, Silty, fine to medium SAND to Sandy SILT	
5	770			- Becomes gray; increase in fines content	
			SM	9.50 765.5 Loose, moist to wet, gray, fine to coarse SAND; little silt	
10	765			11.00 764.0 GRANITIC ROCK (Kgr) ; Weak, weathered, moist, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				12.00 763.0 TRENCH TERMINATED AT 12 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	760				

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



TRENCH NUMBER T-14

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385877 **LONGITUDE** -117.235723
TRENCH DEPTH 8.0 ft
TOP OF TRENCH ELEVATION 775.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	ALLUVIUM (Qal); Loose, moist, dark brown, Silty, fine to medium SAND; few clay	
			SC	Loose, moist, mottled gray and brown, Clayey, fine to medium SAND	
5	770			GRANITIC ROCK (Kgr); Weak, highly weathered, moist, tan brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				TRENCH TERMINATED AT 8 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	765				
15	760				

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

PROJECT NAME	E. Mission Road		
PROJECT NUMBER	G3322-42-01		
DATE STARTED	05-06-2024	COMPLETED	05-06-2024
TRENCHING CONTRACTOR	Dave's Backhoe		
EQUIPMENT TYPE	CAT 430F RT Backhoe W/18" Bucket		
LOGGED BY	N. Borja		

LATITUDE	33.386029	LONGITUDE	-117.236095
TRENCH DEPTH	10.5 ft		
TOP OF TRENCH ELEVATION	770.0 ft		
GROUNDWATER DEPTHS			
▼ GROUNDWATER ENCOUNTERED	NA		

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	ALLUVIUM (Qal); Loose, damp, dark brown, Silty, fine to medium SAND	
				CL	1.50 768.5 Firm to stiff, moist, dark brown, Sandy CLAY	
5	765			SC	5.50 764.5 Medium dense, moist, brown to dark brown, Clayey, fine to medium SAND	
				SM	7.00 763.0 Medium dense to dense, damp, tan brown, Silty, fine to medium SAND; hard digging	
10	760	B T15-1			10.50 759.5 TRENCH TERMINATED AT 10.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	755					

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

**TRENCH NUMBER T-16**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385734 **LONGITUDE** -117.236162
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 773.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	TOPSOIL ; Loose, moist, dark brown, Silty, fine to medium SAND	
	1.50		CL	771.5 Stiff, moist, dark brown, Sandy CLAY	
	3.50			769.5	
	4.50			GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	768			TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	763				
15	758				

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

**TRENCH NUMBER T-17**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386516 **LONGITUDE** -117.235550
TRENCH DEPTH 12.5 ft
TOP OF TRENCH ELEVATION 774.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	ALLUVIUM (Qal) ; Loose, damp, dark brown, Silty, fine to medium SAND	
				ML	1.50 772.5 Firm, moist, brown to reddish brown, Sandy SILT	
				SM	4.00 770.0 Medium dense, moist, mottled gray and brown, Silty, fine to medium SAND	
5	769	B T17-1			- Becomes medium dense to dense below 5 feet	
					- -Becomes reddish brown to brown	
10	764	CHNK T17-2			10.00 764.0 GRANITIC ROCK (Kgr) ; Weak, completely weathered, moist, brown to tan brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
					12.50 761.5 TRENCH TERMINATED AT 12.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	759					

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

**TRENCH NUMBER T-18**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386453 **LONGITUDE** -117.235835
TRENCH DEPTH 13.0 ft
TOP OF TRENCH ELEVATION 771.0 ft

GROUNDWATER DEPTHS

▼ **GROUNDWATER ENCOUNTERED** 12.5

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	ALLUVIUM (Qal) ; Loose, damp, dark brown, Silty, fine to medium SAND	
			1.50 769.5		
			CL	Firm, moist, dark brown, Sandy CLAY	
			4.00 767.0		
			SM	Loose to medium dense, moist, mottled gray and tan brown, Silty, fine to medium SAND	
5	766			- Becomes gray, fine to coarse	
				- Becomes medium dense to dense, brown to grayish brown	
10	761				
			12.50 758.5	▼	
			13.00 758.0		
				TRENCH TERMINATED AT 13 FEET Groundwater encountered at 12.5 feet Backfilled on 05/06/2024.	
15	756				

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

**TRENCH NUMBER T-19**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386395 **LONGITUDE** -117.236113
TRENCH DEPTH 11.0 ft
TOP OF TRENCH ELEVATION 768.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	ALLUVIUM (Qal) ; Loose, damp, dark brown, Silty, fine to medium SAND	
			CL	2.00 766.0 Soft to firm, moist, dark brown, Sandy CLAY	
			SM	4.00 764.0 Loose, moist, brown, Silty, fine to coarse SAND	
5	763				
10	758			10.00 758.0 GRANITIC ROCK (Kgr) ; Weak, highly weathered, moist, brown to yellowish brown and reddish brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				11.00 757.0 TRENCH TERMINATED AT 11 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	753				

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

APPENDIX

B

APPENDIX B

LABORATORY TESTING

We performed laboratory tests in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. We tested selected soil samples for maximum density/optimum moisture content, expansion index, water-soluble sulfate, chloride, plasticity index, and grain size characteristics. The results of our laboratory tests are presented herein.

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

Sample No.	Description (Geologic Unit)	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
T1-2	Reddish brown, Silty, fine to medium SAND (Topsoil)	129.1	10.0
T12-1	Dark brown, Sandy CLAY (Qal)	127.0	10.0

SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS ASTM D 4829

Sample No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	2022 CBC Expansion Classification	ASTM Soil Expansion Classification
	Before Test	After Test				
T7-1	13.3	29.2	97.3	73	Expansive	Medium
T12-1	9.6	21.0	109.6	38	Expansive	Low

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

Sample No.	Depth (feet)	Geologic Unit	Water-Soluble Sulfate (%)	ACI 318 Sulfate Exposure
T7-1	1.5-3	Topsoil	0.001	S0
T12-1	2-4	Qal	0.008	S0

**SUMMARY OF LABORATORY CHLORIDE TEST RESULTS
AASHTO T 291**

Sample No.	Depth (Feet)	Geologic Unit	Chloride Ion Content (ppm)	Chloride Ion Content (%)
T7-1	1.5-3	Topsoil	83	0.008
T12-1	2-4	Qal	88	0.009

**SUMMARY OF LABORATORY PLASTICITY INDEX TEST RESULTS
ASTM D 4318**

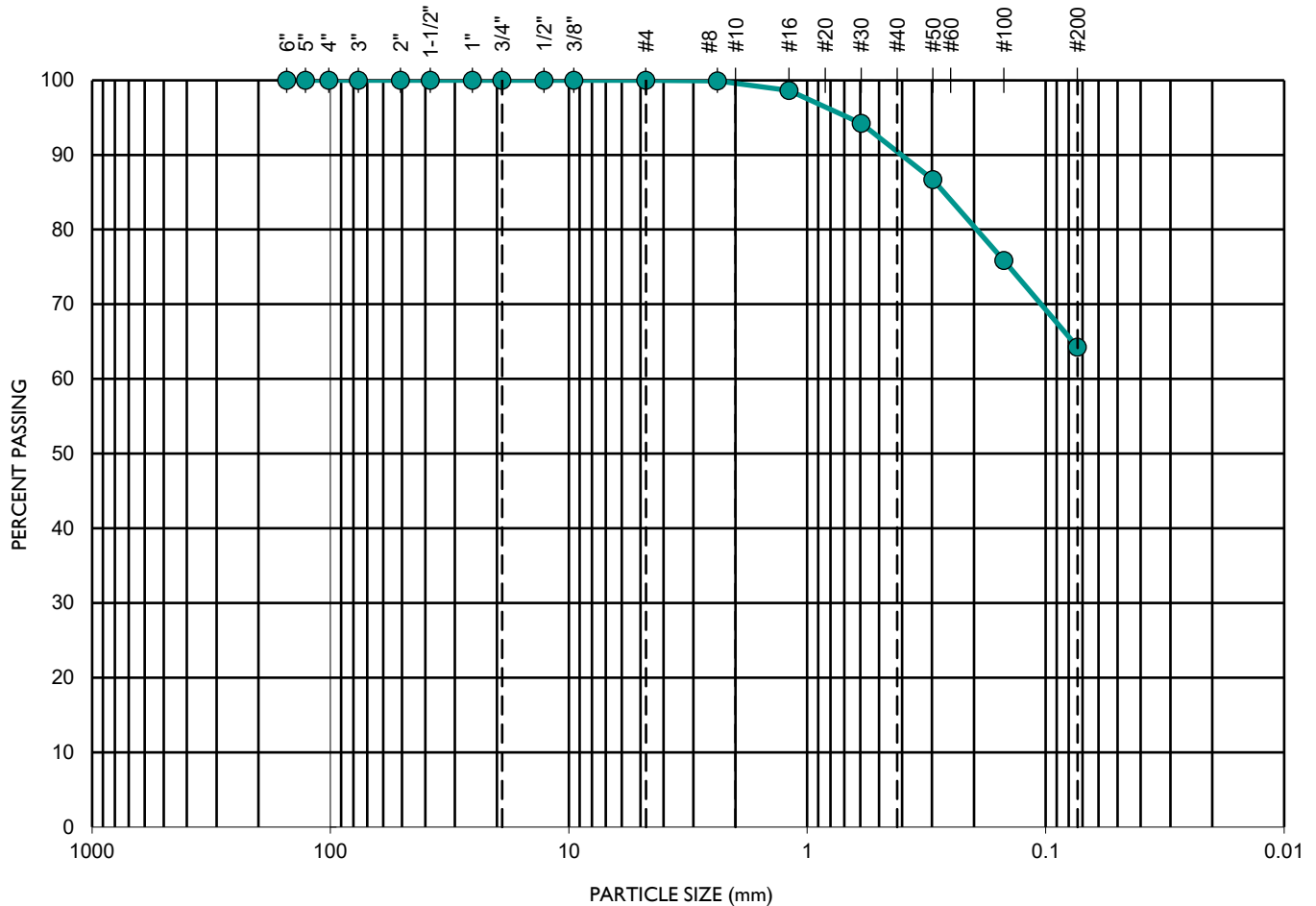
Sample No.	Depth (Feet)	Geologic Unit	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
T7-1	1.5-3	Topsoil	51	21	30	CH
T12-1	2-4	Qal	31	15	16	CL

SAMPLE NO.: **T7-1**
 SAMPLE DEPTH (FT.): **1.5-3'**

GEOLOGIC UNIT: **Topsoil**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE



TEST DATA					
D ₁₀ (mm)	D ₃₀ (mm)	D ₆₀ (mm)	C _c	C _u	SOIL DESCRIPTION
0.012	0.034	0.069	1.5	6.0	CH - Sandy, fat CLAY

GEOCON
INCORPORATED



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

SIEVE ANALYSES - ASTM D 6913

1305 EAST MISSION ROAD

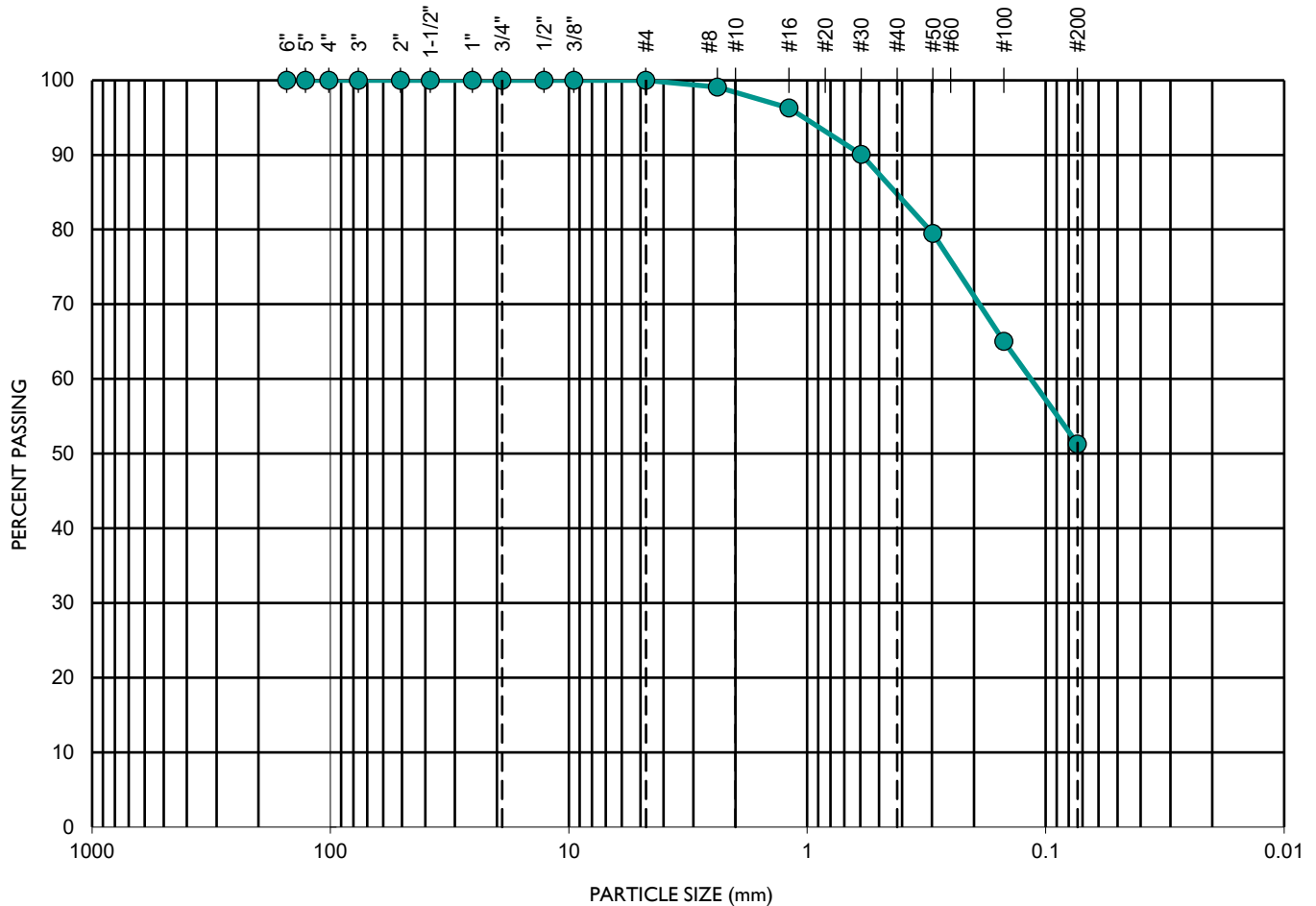
PROJECT NO.: G3322-42-01

SAMPLE NO.: **T12-1**
 SAMPLE DEPTH (FT.): **2-4'**

GEOLOGIC UNIT: **Qal**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE



TEST DATA					
D ₁₀ (mm)	D ₃₀ (mm)	D ₆₀ (mm)	C _c	C _u	SOIL DESCRIPTION
0.014	0.043	0.122	1.1	8.4	CL - Sandy, lean CLAY

GEOCON
INCORPORATED



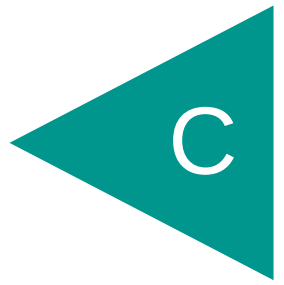
GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
 PHONE 858 558-6900 - FAX 858 558-6159

SIEVE ANALYSES - ASTM D 6913

1305 EAST MISSION ROAD

PROJECT NO.: G3322-42-01

APPENDIX



APPENDIX C

STORMWATER MANAGEMENT INVESTIGATION

We understand storm water management devices are being proposed in accordance with the 2020 County of San Diego BMP Design Manual. If not properly constructed, there is a risk for potential distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water to be detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff occurs, downstream properties may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

Hydrologic Soil Group

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, possesses general information regarding the existing soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. The table below presents the descriptions of the hydrologic soil groups. In addition, the USDA website also provides an estimated saturated hydraulic conductivity for the existing soil.

HYDROLOGIC SOIL GROUP DEFINITIONS

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

The table below presents the information from the USDA website for the subject property.

USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group	k _{SAT} of Most Limiting Layer (Inches/ Hour)
Fallbrook-Vista sandy loams, 9 to 15 percent slopes	FvD	36	B	0.20 – 0.57
Placentia sandy loam, 2 to 9 percent slopes, warm MAAT MLRA 19	PeC	64	C	0.06 – 0.60

Infiltration Testing

We performed infiltration tests at the locations shown on the *Geologic Map*, Figure 1. The table below presents the results of the infiltration tests. Data sheets are attached. We applied an estimated feasibility factor of safety of 2.0 to our estimated infiltration rates to provide input in Table D.2-1 of Appendix B in the BMP manual. Soil infiltration rates from in-situ tests can vary significantly from one location to another due to the heterogeneous characteristics inherent to most soil.

INFILTRATION TEST RESULTS

Test No.	Geologic Unit	Test Elevation (feet, MSL)	Field-Saturated Hydraulic Conductivity/Infiltration Rate, k _{sat} (inch/hour)	Infiltration Rate ¹ (inch/hour)
A-1	Qal	776	0.011	0.005
A-2	Qal	771	0.009	0.004
A-3	Kgr	782	0.043	0.021
A-4	Kgr	785	0.010	0.005
Average			0.018	0.009

¹ Using a Factor of Safety of 2.

GEOTECHNICAL CONSIDERATIONS

Groundwater Elevations

We encountered groundwater at a depth of 12.5 feet below existing grade trench T-18. It is not uncommon for shallow seepage conditions to develop where none previously existed when sites are irrigated or infiltration is implemented. Groundwater and seepage are dependent on seasonal precipitation, irrigation, land use, among other factors, and varies as a result.

New or Existing Utilities

Utilities are located on the property and adjacent to the property within roadways. Infiltration within the areas near these utilities should be considered infeasible. Setbacks for infiltration should be incorporated if infiltration were to be considered. The setback for infiltration devices should be a minimum of 10 feet and a 1:1 plane of 1 foot below the closest edge of the deepest adjacent utility.

Existing and Planned Structures

Existing and proposed buildings are present on and adjacent to the site. In addition, water should not be allowed to infiltrate in areas where it could affect the neighboring properties and existing adjacent structures, improvements, and roadway. Mitigation for existing structures consists of not allowing water infiltration within a lateral distance of at least 10 feet from the new or existing foundations and property lines. The planned structure will extend over most of the property, and there will be no locations onsite that will be outside of a 10-foot setback from the planned building. Therefore, infiltration should be restricted.

Soil or Groundwater Contamination

We are unaware of contaminated soil on the property. Therefore, infiltration associated with this risk is considered unrestricted. In addition, groundwater mounding would not be a concern due to the lack of a near surface groundwater table.

CONCLUSIONS AND RECOMMENDATIONS

Infiltration Rates

Our test results indicated relatively low infiltration rates, with an average rate of 0.018 in/hr, which can be used as the corrected infiltration rate on Table D.2-1 of the County of San Diego Storm Water Manual. The table below provides the information from Table D.2-1 of the storm water manual.

ELEMENTS FOR DETERMINATION OF DESIGN INFILTRATION RATES
(TABLE D.2-1 OF APPENDIX D)

Item	Value	Unit
Initial Infiltration Rate: Identify per Section D.2.1	0.018	in/hr
Corrected Infiltration Rate: Identify per Section D.2.2	0.018	in/hr
*Safety Factor: Identify per Section D.2.3	2	unitless
Design Infiltration Rate: Corrected Infiltration Rate ÷ Safety Factor	0.009	in/hr

*The final Safety Factor should be determined by the civil engineer.

Infiltration Restrictions

We have evaluated proposed BMPs with respect to the infiltration restrictions contained in Form 4 in Appendix D of the City of Oceanside Storm Water Manual. The table below provides the information.

**INFILTRATION RESTRICTIONS FOR BASIC INFILTRATION ANALYSIS
(TABLE D.1-1 OF APPENDIX D)**

Restriction Element		Is Element Applicable? (Yes/No)
Mandatory Considerations	BMP is within 100' of Contaminated Soils	No
	BMP is within 100' of Industrial Activities Lacking Source Control	No
	BMP is within 100' of Well/Groundwater Basin	No
	BMP is within 50' of Septic Tanks/Leach Fields	No
	BMP is within 10' of Structures/Tanks/Walls	No
	BMP is within 10' of Sewer Utilities	No
	BMP is within 10' of Seasonal High Groundwater	No
	BMP is within Hydric Soils	No
	BMP is within Highly Liquefiable Soils and has Connectivity to Structures	No
	BMP is within 1.5 Times the Height of Adjacent Steep Slopes ($\geq 25\%$)	No
	County Staff has Assigned "Restricted" Infiltration Category	No
Optional Considerations	BMP is within Predominantly Type D Soil	No
	BMP is within 5' of Property Line	No
	BMP is within Fill Depths of $\geq 5'$ (Existing or Proposed)	No
	BMP is within 10' of Underground Utilities	No
	BMP is within 250' of Ephemeral Stream	No
Result	Based on examination of the best available information, I have not identified any restrictions above.	X
	Based on examination of the best available information, I have identified one or more restrictions above.	

Storm Water Evaluation Conclusion

Based on the information in the table above, there are no restrictions identified and the site is considered "unrestricted" for infiltration based on the County's guideline. However, infiltration tests performed within the existing alluvium and granitic rock indicate a very low average rate of 0.009 inches per hour (with a factor of safety of 2).

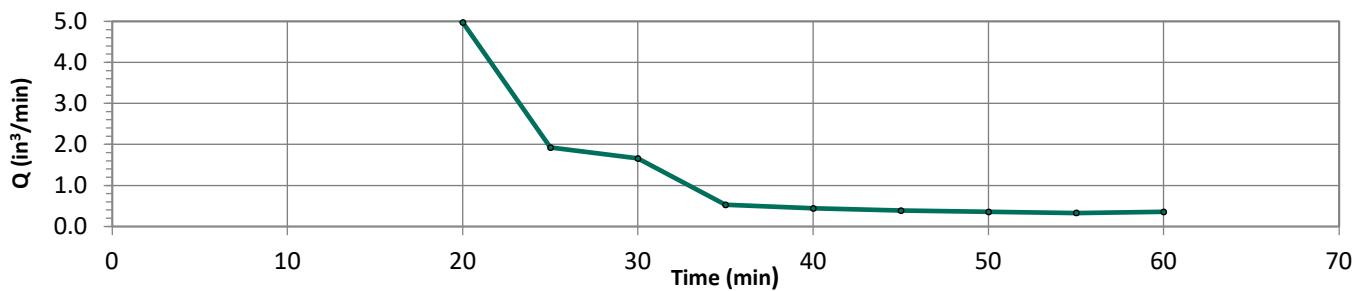
Storm Water Management Devices

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

TEST NO.: A-1GEOLOGIC UNIT: QalEXCAVATION ELEVATION (MSL, FT): 776

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	4.5
TEST/BOTTOM ELEVATION (MSL, FT):	772
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	6.2
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	0.351
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.011
FACTORED INFILTRATION RATE (IN/HR):	0.005



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	7.925	219.46	43.892
3	5.00	1.895	52.48	10.495
4	5.00	1.315	36.42	7.283
5	5.00	1.300	36.00	7.200
6	5.00	0.898	24.87	4.974
7	5.00	0.347	9.61	1.922
8	5.00	0.300	8.31	1.662
9	5.00	0.095	2.63	0.526
10	5.00	0.080	2.22	0.443
11	5.00	0.070	1.94	0.388
12	5.00	0.065	1.80	0.360
13	5.00	0.060	1.66	0.332
14	5.00	0.065	1.80	0.360

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AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

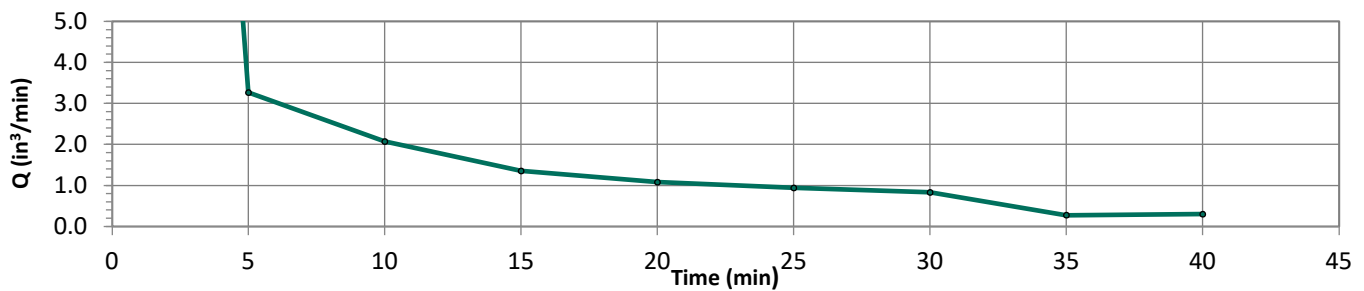
PROJECT NO.:

G3322-42-01

TEST NO.: A-2GEOLOGIC UNIT: QalEXCAVATION ELEVATION (MSL, FT): 771

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	4.0
TEST/BOTTOM ELEVATION (MSL, FT):	767
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	6.1
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	0.286
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.009
FACTORED INFILTRATION RATE (IN/HR):	0.004



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	8.590	237.88	47.575
3	5.00	0.590	16.34	3.268
4	5.00	0.375	10.38	2.077
5	5.00	0.245	6.78	1.357
6	5.00	0.195	5.40	1.080
7	5.00	0.170	4.71	0.942
8	5.00	0.150	4.15	0.831
9	5.00	0.050	1.38	0.277
10	5.00	0.055	1.52	0.305
11	5.00	0.050	1.38	0.277

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AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

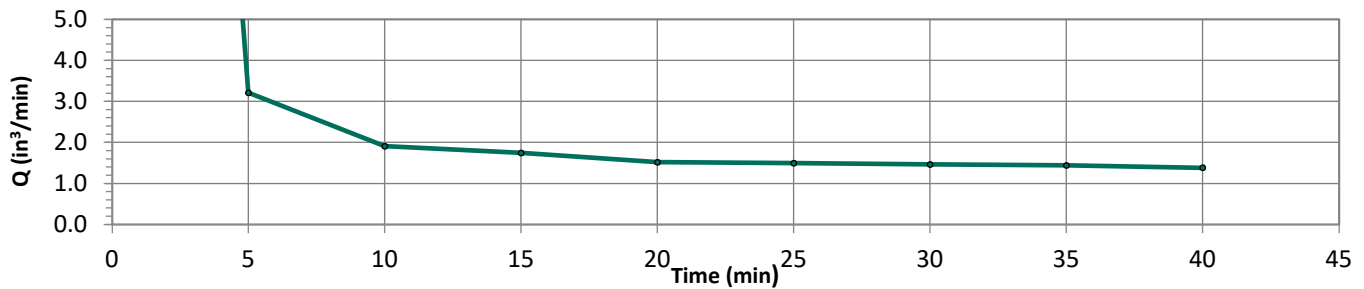
PROJECT NO.:

G3322-42-01

TEST NO.: A-3GEOLOGIC UNIT: KgrEXCAVATION ELEVATION (MSL, FT): 782

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	3.0
TEST/BOTTOM ELEVATION (MSL, FT):	779
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	5.9
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	1.394
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.043
FACTORED INFILTRATION RATE (IN/HR):	0.021



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	8.395	232.48	46.495
3	5.00	0.580	16.06	3.212
4	5.00	0.345	9.55	1.911
5	5.00	0.315	8.72	1.745
6	5.00	0.275	7.62	1.523
7	5.00	0.270	7.48	1.495
8	5.00	0.265	7.34	1.468
9	5.00	0.260	7.20	1.440
10	5.00	0.250	6.92	1.385
11	5.00	0.250	6.92	1.385
12	5.00	0.255	7.06	1.412

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AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

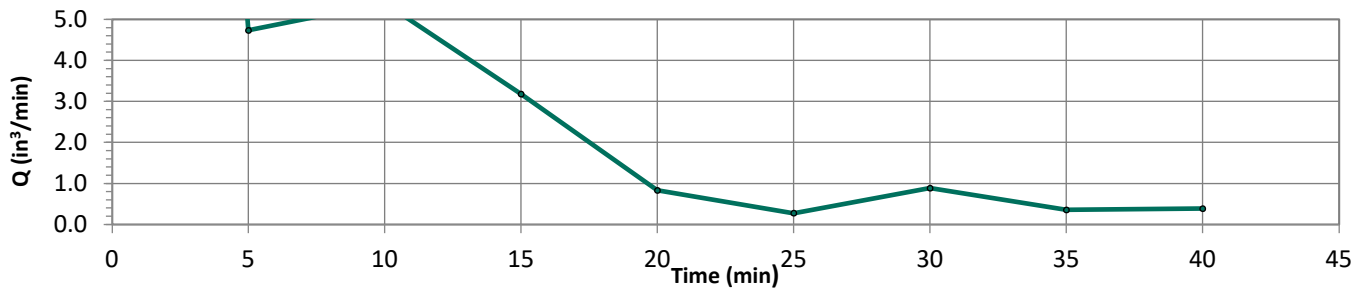
PROJECT NO.:

G3322-42-01

TEST NO.: A-4GEOLOGIC UNIT: KgrEXCAVATION ELEVATION (MSL, FT): 785

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	3.5
TEST/BOTTOM ELEVATION (MSL, FT):	782
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	6.0
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	0.342
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.010
FACTORED INFILTRATION RATE (IN/HR):	0.005



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	9.095	251.86	50.372
3	5.00	0.855	23.68	4.735
4	5.00	0.975	27.00	5.400
5	5.00	0.575	15.92	3.185
6	5.00	0.150	4.15	0.831
7	5.00	0.050	1.38	0.277
8	5.00	0.160	4.43	0.886
9	5.00	0.065	1.80	0.360
10	5.00	0.070	1.94	0.388
11	5.00	0.060	1.66	0.332
12	5.00	0.065	1.80	0.360
13	5.00	0.060	1.66	0.332

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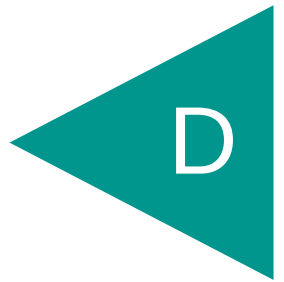
AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

PROJECT NO.:

G3322-42-01

APPENDIX



APPENDIX D

RECOMMENDED GRADING SPECIFICATIONS

FOR

1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA

PROJECT NO. G3322-42-01

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

- 1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.
- 1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.
- 1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

- 2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.
- 2.2 **Contractor** shall refer to the Contractor performing the site grading work.
- 2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

- 2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.
- 2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.
- 2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.
- 2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

- 3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.
- 3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than $\frac{3}{4}$ inch in size.
- 3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.
- 3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than $\frac{3}{4}$ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

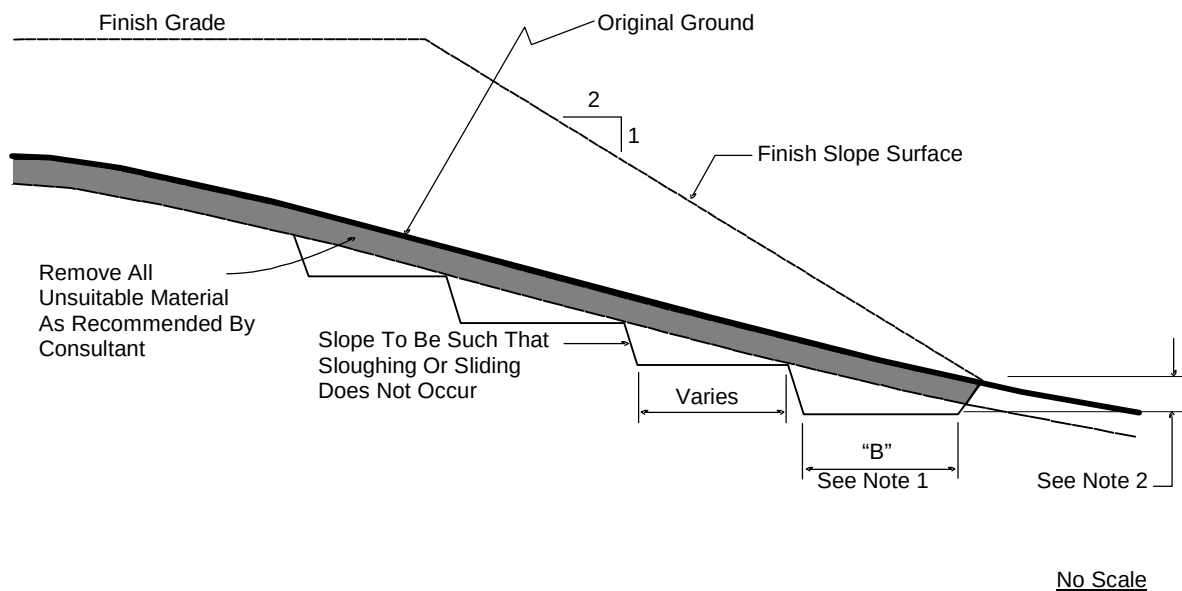
- 3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.
- 3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.
- 3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.
- 3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.
- 3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

4. CLEARING AND PREPARING AREAS TO BE FILLED

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

- 4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.
- 4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.
- 4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



- DETAIL NOTES:
- (1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.
 - (2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

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

5. COMPACTION EQUIPMENT

- 5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.
- 5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

- 6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:
- 6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.
- 6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.
- 6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.
- 6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

- 6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.
- 6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.
- 6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.
- 6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.
- 6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:
- 6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.
- 6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in

maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

- 6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.
- 6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.
- 6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.
- 6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.
- 6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:
 - 6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.
 - 6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the

rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

- 6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.
- 6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of “passes” have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.
- 6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.
- 6.3.6 To reduce the potential for “piping” of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock*

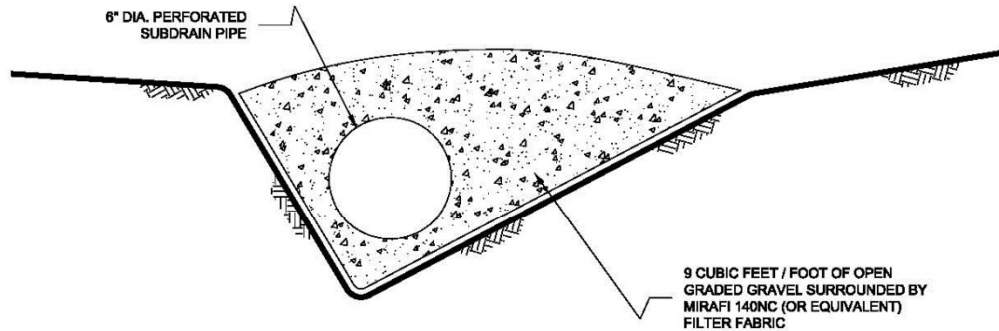
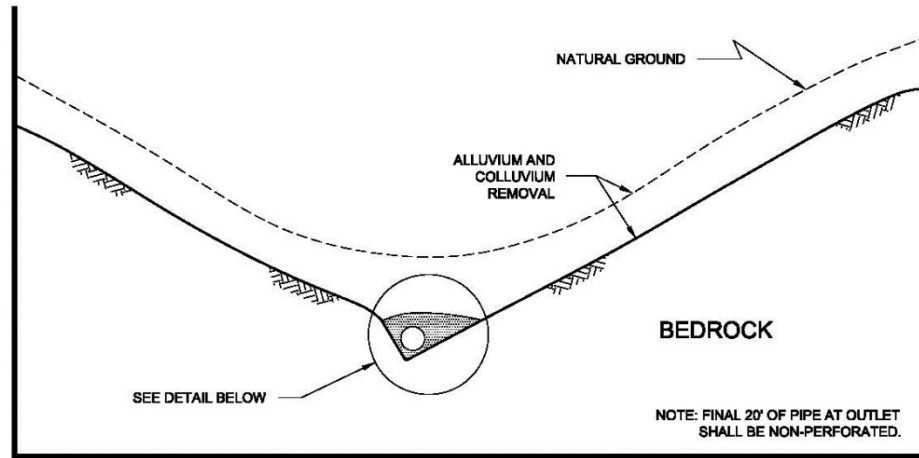
should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

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

7. SUBDRAINS

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

TYPICAL CANYON DRAIN DETAIL



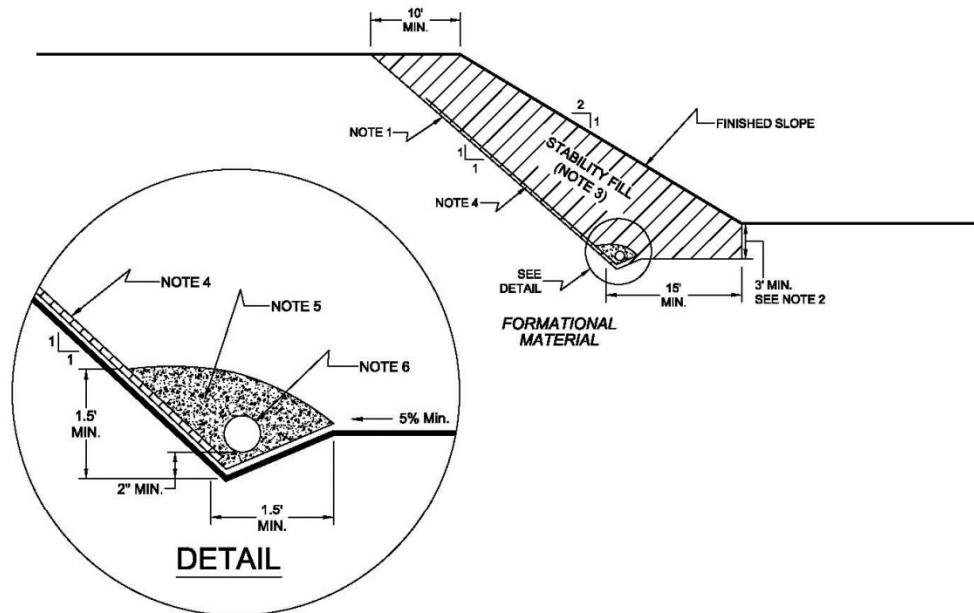
NOTES:

- 1.....8-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.
- 2.....6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

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

TYPICAL STABILITY FILL DETAIL



NOTES:

- 1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).
- 2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.
- 3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.
- 4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.
- 5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).
- 6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

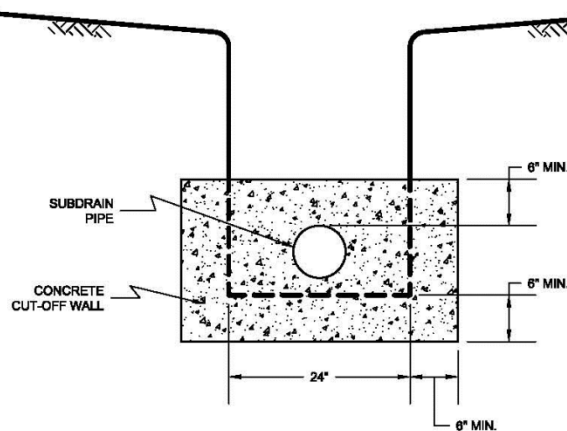
NO SCALE

- 7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.
- 7.4 *Rock fill or soil-rock fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. Rock fill drains should be constructed using the same requirements as canyon subdrains.*

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

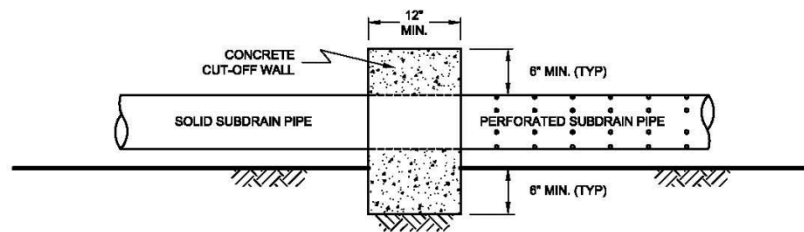
TYPICAL CUT OFF WALL DETAIL

FRONT VIEW



NO SCALE

SIDE VIEW

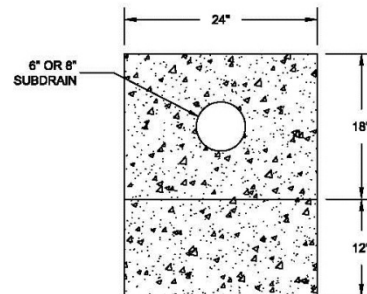


NO SCALE

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

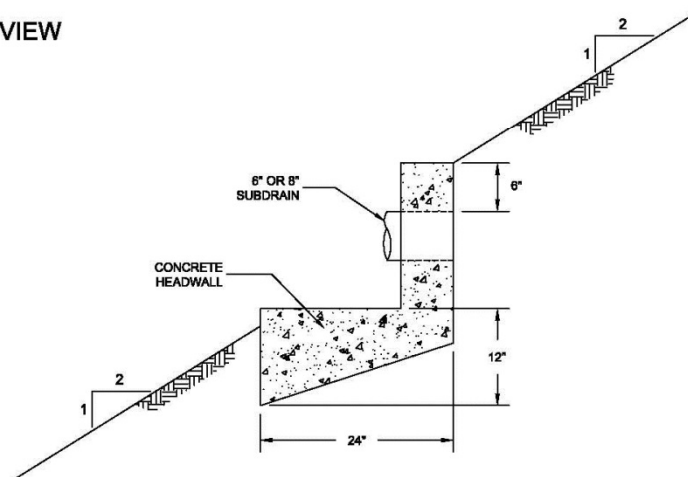
TYPICAL HEADWALL DETAIL

FRONT VIEW



NO SCALE

SIDE VIEW



NOTE: HEADWALL SHOULD OUTLET AT TOE OF FILL SLOPE
OR INTO CONTROLLED SURFACE DRAINAGE

NO SCALE

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

burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

- 8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.
- 8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.
- 8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.
- 8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.
- 8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.
- 8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

- 8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method*.
- 8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth)*.
- 8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.
- 8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

- 9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.
- 9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

- 10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.
- 10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in

geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

LIST OF REFERENCES

- American National (2024), *Topographic Detail Sheet, 1305 East Mission Road, Fallbrook, California*, dated May 8, 2024;
- CGS (2021a), *EQ Zapp: California Earthquake Hazards Zone Application*, online map that queries California Geological Survey mapped earthquake hazard zones, <https://www.conservation.ca.gov/cgs/geohazards/eq-zapp>, accessed May 31, 2024;
- CGS (2021b), *Tsunami Inundation Maps and Data*, web application for accessing tsunami inundation hazard, <https://www.conservation.ca.gov/cgs/tsunami/maps>, accessed May 31, 2024;
- FEMA (2019), *Flood Map Service Center*, FEMA website, <https://msc.fema.gov/portal/home>, flood map number 06073C0165G, effective May 16, 2012, accessed May 31, 2024;
- Kennedy, M. P., and Tan, S. S., (2007), *Geologic Map of the Oceanside 30' x 60' Quadrangle, California*, USGS Regional Geologic Map Series, 1:100,000 Scale, Map No. 3;
- SEAOCC (2020), *Seismic Design Maps*, website interface that queries the U.S. Geological Survey (USGS) web servers and retrieves the seismic design variables using ASCE 7-16, ASCE 7-10, ASCE 41-13, ASCE 41-17, IBC 2015, IBC 2012, NEHRP-2015, and NEHRP 2009 seismic design map data, <http://seismicmaps.org>, accessed May 31, 2024;
- USGS (2019), *Quaternary Fault and Fold Database of the United States*: U.S. Geological Survey website, <https://www.usgs.gov/natural-hazards/earthquake-hazards/faults>, accessed May 31, 2024.

Appendix 14



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



TEMECULA QUADRANGLE
CALIFORNIA
7.5-MINUTE TOPO

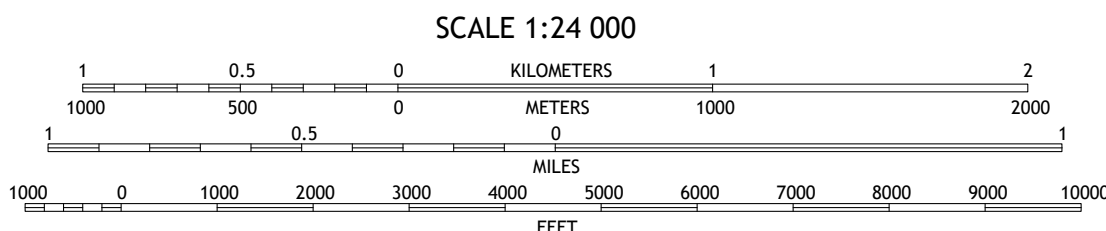
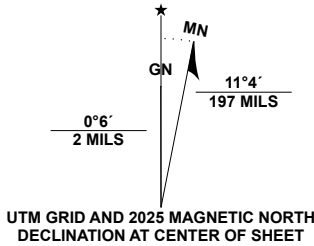


Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: UNIVERSAL TRANSVERSE MERCATOR, ZONE 11S
Data is provided by The National Map (TNM), is the best available at the time of map
generation, and includes data content from supporting themes of Elevation,
Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover,
and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC)
Metadata for additional source data information.

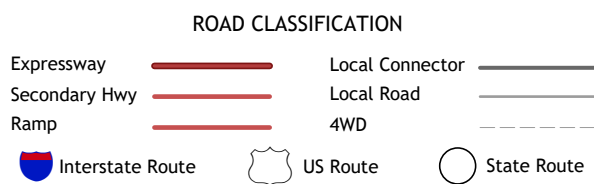
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Private lands within government reservations may not be shown. Obtain permission
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Wildomar	Murrieta	Bachelor Mountain
Fallbrook	Temecula	Pechanga
Morjo Hill	Bonsall	Pala

ADJOINING QUADRANGLES



TEMECULA, CA
2025

Appendix 15

CONDUIT AND DITCH SIZING CALCULATIONS

The following chart details the sizing parameters and for conduits that convey runoff on the site.

K'= Discharge factor	=	$(Q*n)/(d^{8/3}*s^{1/2})$
n= Mannings coefficient	=	0.012 for PVC & HDPE and 0.013 for concrete channels
d=diameter of conduit (ft)	=	per chart
Q= Discharge	=	based off portions of basins tributary to outlet
s=Minimum Pipe Slope (ft/ft)	=	per chart
D=depth of flow	=	From table 7-4 See right
C _a = Flow factor	=	From table 7-14 See right
A=Cross sectional area of flow	=	C_a*d^2
V=Velocity	=	Q/A

Pipe Flow

Pipe	Tributary Areas	Q (cfs)	S (%)	d (in)	K'	D/d	C _a	A (sf)	V (fps)
1	Buildings and drive aisles on Basin P-2	6.64	8.7	12	0.2700	0.54	0.4330	0.4330	15.33
2	Southerly portion of private road	1.52	0.5	12	0.2586	0.53	0.4230	0.4230	3.60
3	Entire Basin P-2	9.71	1.0	18	0.3952	0.71	0.5960	1.3410	7.24
4	Entire Basin P-2	9.71	3.4	18	0.2143	0.47	0.3627	0.8161	11.90
5	Entire Basin P-2	9.71	7.0	24	0.0694	0.26	0.1623	0.6492	14.96
6	Portion of Basin P-1	4.39	0.5	18	0.2526	0.52	0.4130	0.9293	4.72
7	Portion of Basin P-1	4.99	0.5	18	0.2871	0.57	0.4620	1.0395	4.80
8	Portion of Basin P-1	9.15	1.0	18	0.3723	0.67	0.5590	1.2578	7.27
9	Portion of Basin P-1	9.73	1.0	18	0.3960	0.71	0.5960	1.3410	7.26
10	Portion of Basin P-1	11.88	1.0	18	0.4833	0.86	0.7190	1.6178	7.34
11	Portion of Basin P-1	13.33	4.3	24	0.1215	0.34	0.2355	0.9420	14.15
12	Entire Basin P-1	13.33	2.4	24	0.1626	0.40	0.2934	1.1736	11.36
13	Entire onsite areas	24.94	0.5	48	0.1050	0.31	0.2074	3.3184	7.52
14	Offsite trib. Area to culverts divided by 2	104.92	0.5	48	0.4416	0.78	0.6570	10.5120	9.98
-	Max capacity of single 48" pipe	118.00	0.5	48	0.4967	0.91	0.7500	12.0000	9.83

*Note: The max trib. offsite flow to pipe # 14 was calculated to be 209.83 cfs

Brow Ditch

Ditch	Tributary Areas	Q (cfs)	S (%)	d (in)	K'	D/T	C _a	A (sf)	V (fps)
1	Offsite Basin O-1	1.85	10.0	24	0.0120	0.11	0.0470	0.1880	9.84
2	Offsite Basin O-1	1.85	5.0	24	0.0169	0.13	0.0600	0.2400	7.71
3	Neighboring offsite SDGE Facility	9.32	2.0	24	0.1349	0.36	0.2546	1.0184	9.15

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

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

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

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

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

D = depth of water *d* = diameter of channel

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

Reference: page 7-78 & 7-18 of The Handbook of Hydraulics, by Brater & King

Appendix 16

StreamStats Report

Region ID:

Workspace ID:

Clicked Point (Latitude, Longitude):

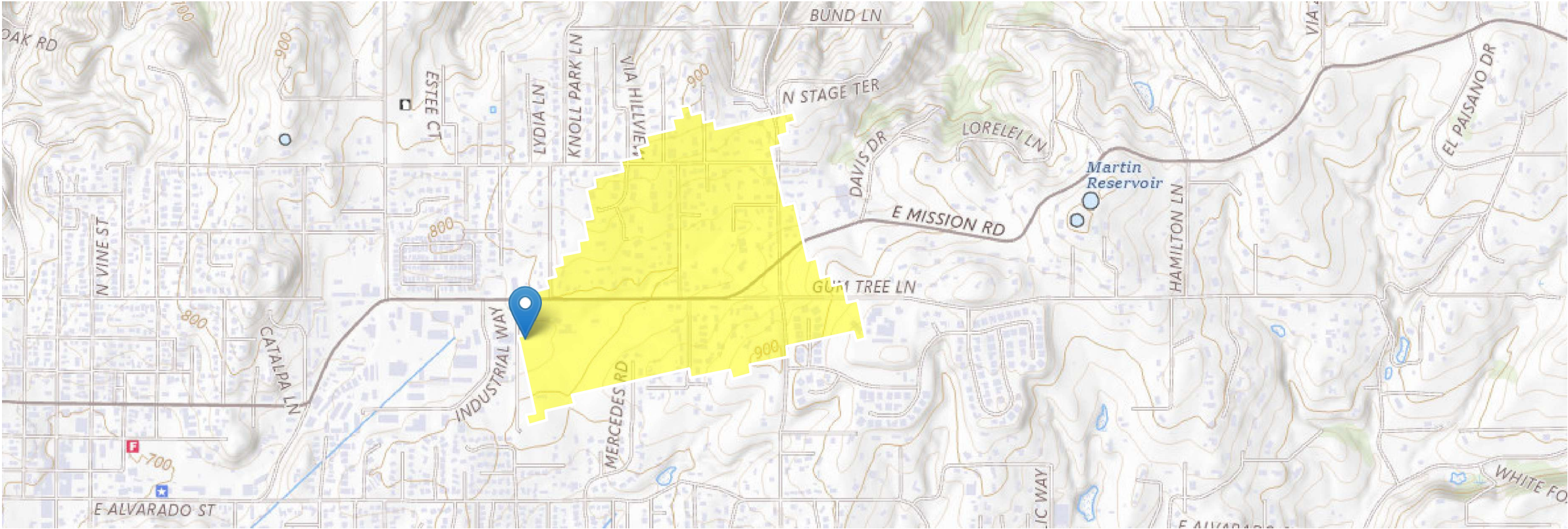
Time:

CA

CA20251121220820694000

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2025-11-21 14:08:44 -0800



+ Collapse All

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.22	square miles
PRECIP	Mean Annual Precipitation	17.7	inches

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [2012 5113 Region 5 South Coast]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.22	square miles	0.04	850
PRECIP	Mean Annual Precipitation	17.7	inches	10	45

Peak-Flow Statistics Flow Report [2012 5113 Region 5 South Coast]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	11.3	ft^3/s	1.96	65.1	134
20-percent AEP flood	29.7	ft^3/s	8.52	103	83.1
10-percent AEP flood	43.4	ft^3/s	15.7	120	64
4-percent AEP flood	59.3	ft^3/s	25.5	138	51.5
2-percent AEP flood	70.9	ft^3/s	32.4	155	47.6
1-percent AEP flood	82.1	ft^3/s	37.5	180	47.2
0.5-percent AEP flood	94	ft^3/s	42.4	208	47.7
0.2-percent AEP flood	106	ft^3/s	45.4	248	52

Peak-Flow Statistics Citations

Gotvald, A.J., Barth, N.A., Veilleux, A.G., and Parrett, Charles,2012, Methods for determining magnitude and frequency of floods in California, based on data through water year 2006: U.S. Geological Survey Scientific Investigations Report 2012–5113, 38 p., 1 pl. (<http://pubs.usgs.gov/sir/2012/5113/>)

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Application Version: 4.29.3
StreamStats Services Version: 1.2.22

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

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

Table 3-2

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

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	Offsite Basin, O-3	85	10.9	100	10.3	100	8.7	100	6.9		
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

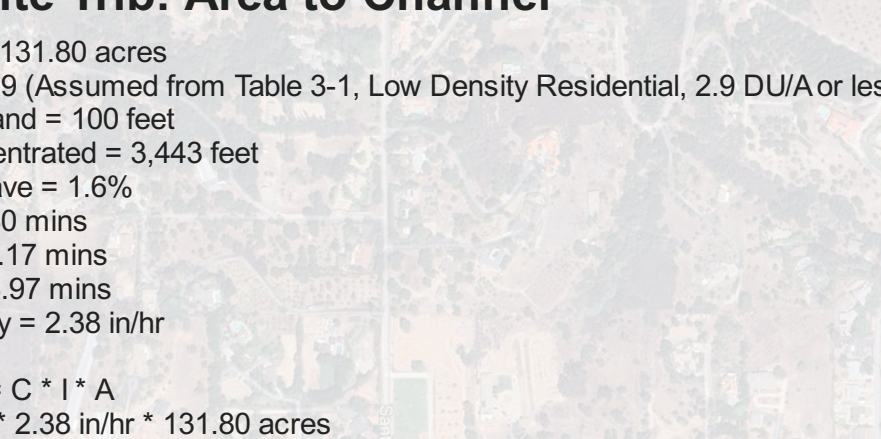
**Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS**

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

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, C_p , for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre

NRCS = National Resources Conservation Service



Offsite Trib. Area to Channel

Area = 131.80 acres
C = 0.49 (Assumed from Table 3-1, Low Density Residential, 2.9 DU/A or less)
L overland = 100 feet
L concentrated = 3,443 feet
Slope ave = 1.6%
Ti = 8.80 mins
Tt = 20.17 mins
Tc = 28.97 mins
Intensity = 2.38 in/hr

$Q_{100} = C * I * A$
 $= 0.49 * 2.38 \text{ in/hr} * 131.80 \text{ acres}$
 $= 153.42 \text{ cfs}$

C = 0.49 (Assumed from Table 3-1, Low Density Residential, 2.9 DU/A or less)

L concentrated = 3,443 feet

$$T_i = 8.80 \text{ mins}$$
$$T_c = 28.97 \text{ mins}$$

$$= 0.49 * 2.38 \text{ in/hr} * 131.80 \text{ acres}$$

1305 E Mission Rd
Fallbrook Offsite Trib. Area

 Fallbrook Offsite Trib. Area

Image © 2026 Airbus
Image © 2026 Vexcel Imaging US, Inc.



2000 ft

Appendix 17

Inlet Report

Inlet # 1 Capacity

Curb Inlet

Location	= Sag
Curb Length (ft)	= 8.00
Throat Height (in)	= 4.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

Slope, Sw (ft/ft)	= 0.065
Slope, Sx (ft/ft)	= 0.034
Local Depr (in)	= 1.00
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

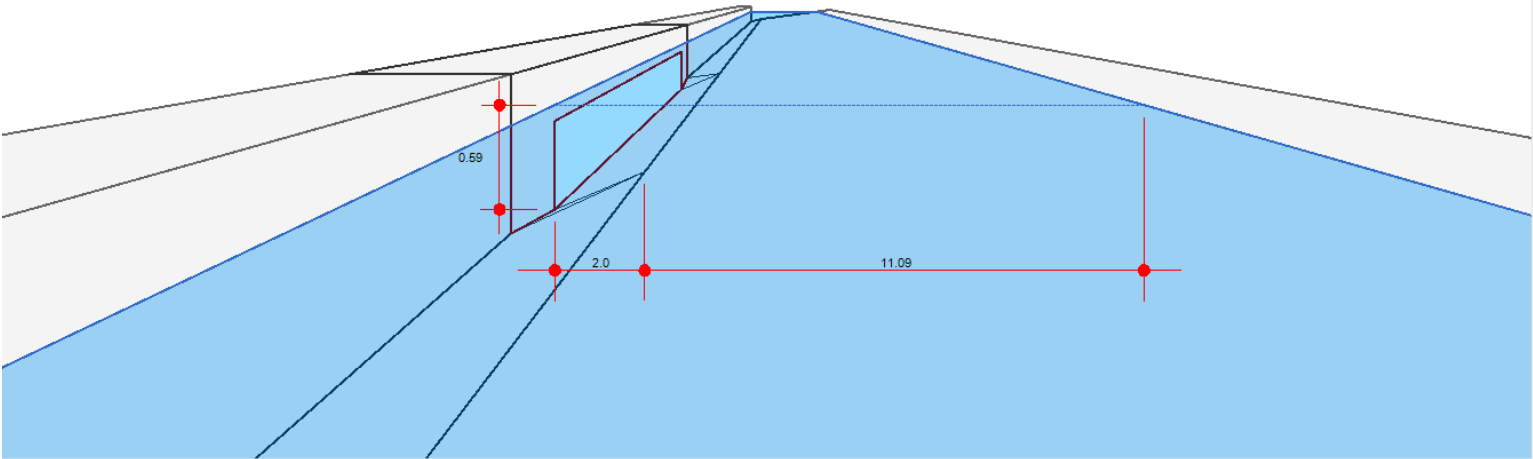
Calculations

Compute by:	Known Q
Q (cfs)	= 7.93

Highlighted

Q Total (cfs)	= 7.93
Q Capt (cfs)	= 7.93
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 7.09
Efficiency (%)	= 100
Gutter Spread (ft)	= 13.09
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

All dimensions in feet



Inlet Report

Inlet # 2 Capacity

Curb Inlet

Location	= On grade
Curb Length (ft)	= 14.00
Throat Height (in)	= 4.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

Slope, Sw (ft/ft)	= 0.065
Slope, Sx (ft/ft)	= 0.034
Local Depr (in)	= 1.00
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= 5.00
Gutter n-value	= 0.016

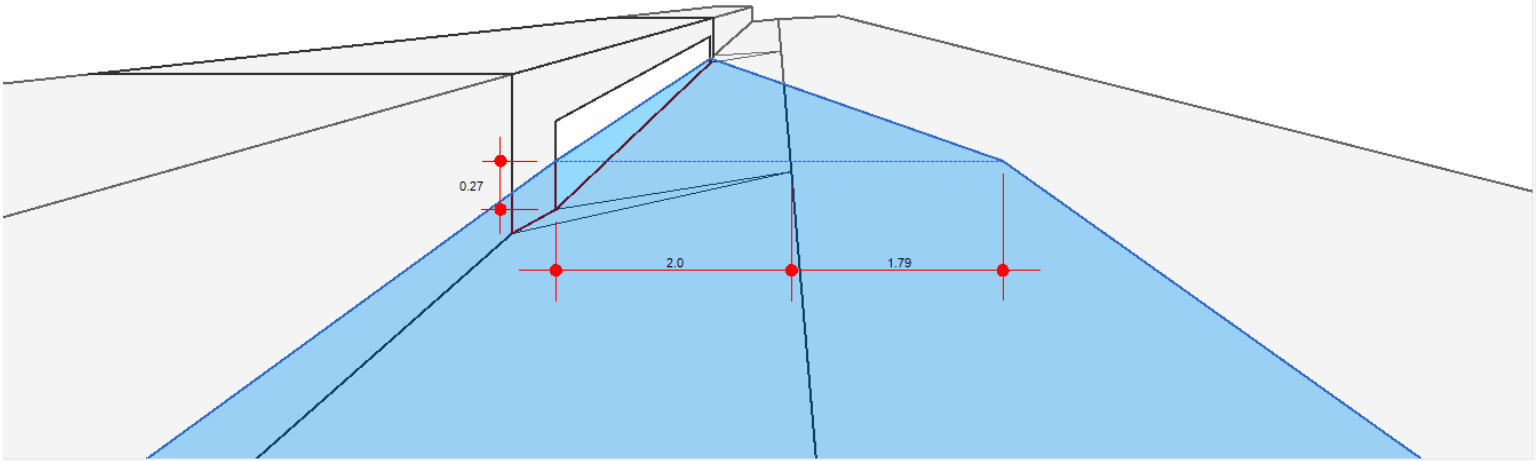
Calculations

Compute by:	Known Q
Q (cfs)	= 1.52

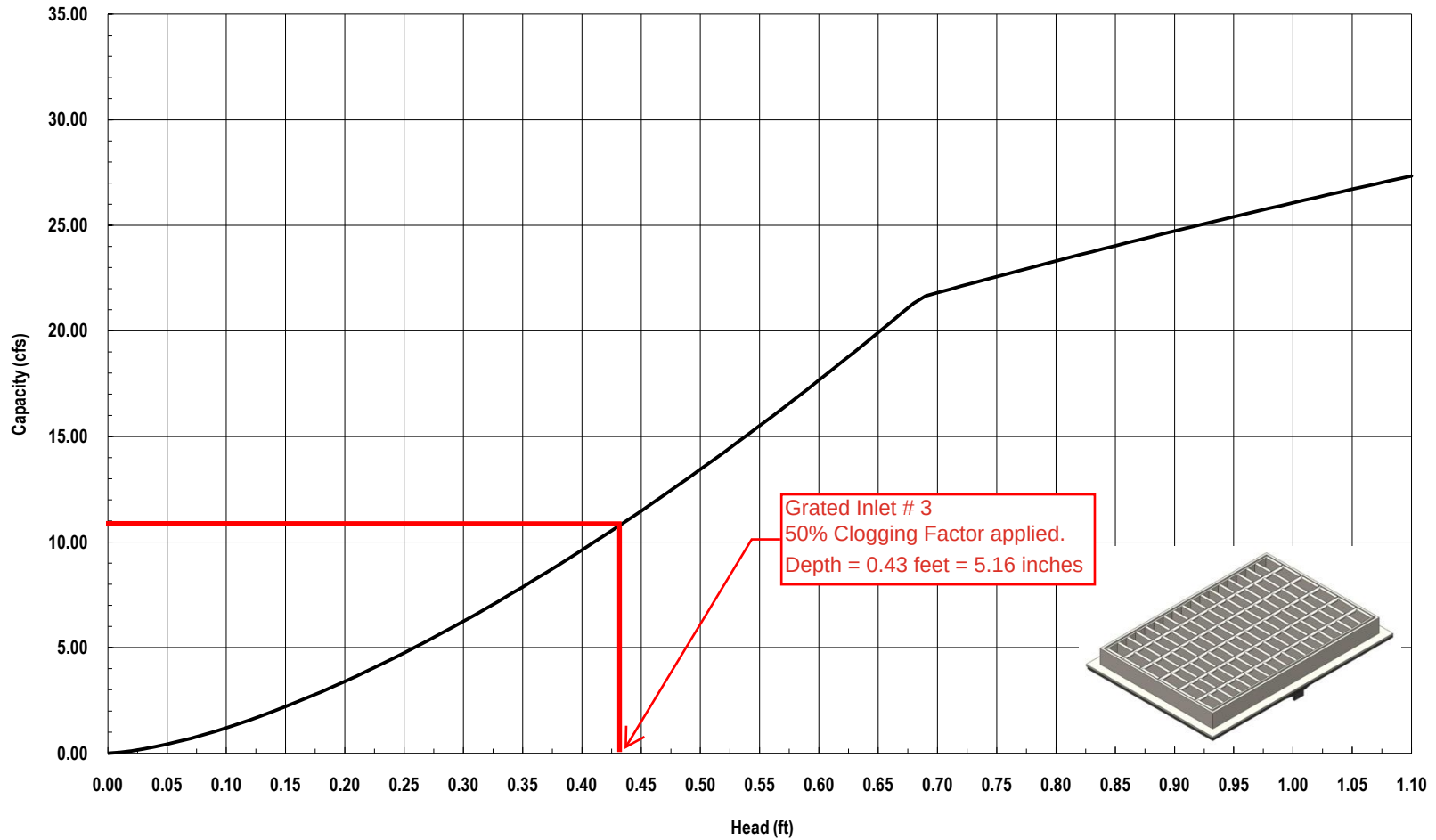
Highlighted

Q Total (cfs)	= 1.52
Q Capt (cfs)	= 1.52
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.29
Efficiency (%)	= 100
Gutter Spread (ft)	= 3.79
Gutter Vel (ft/s)	= 4.96
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

All dimensions in feet



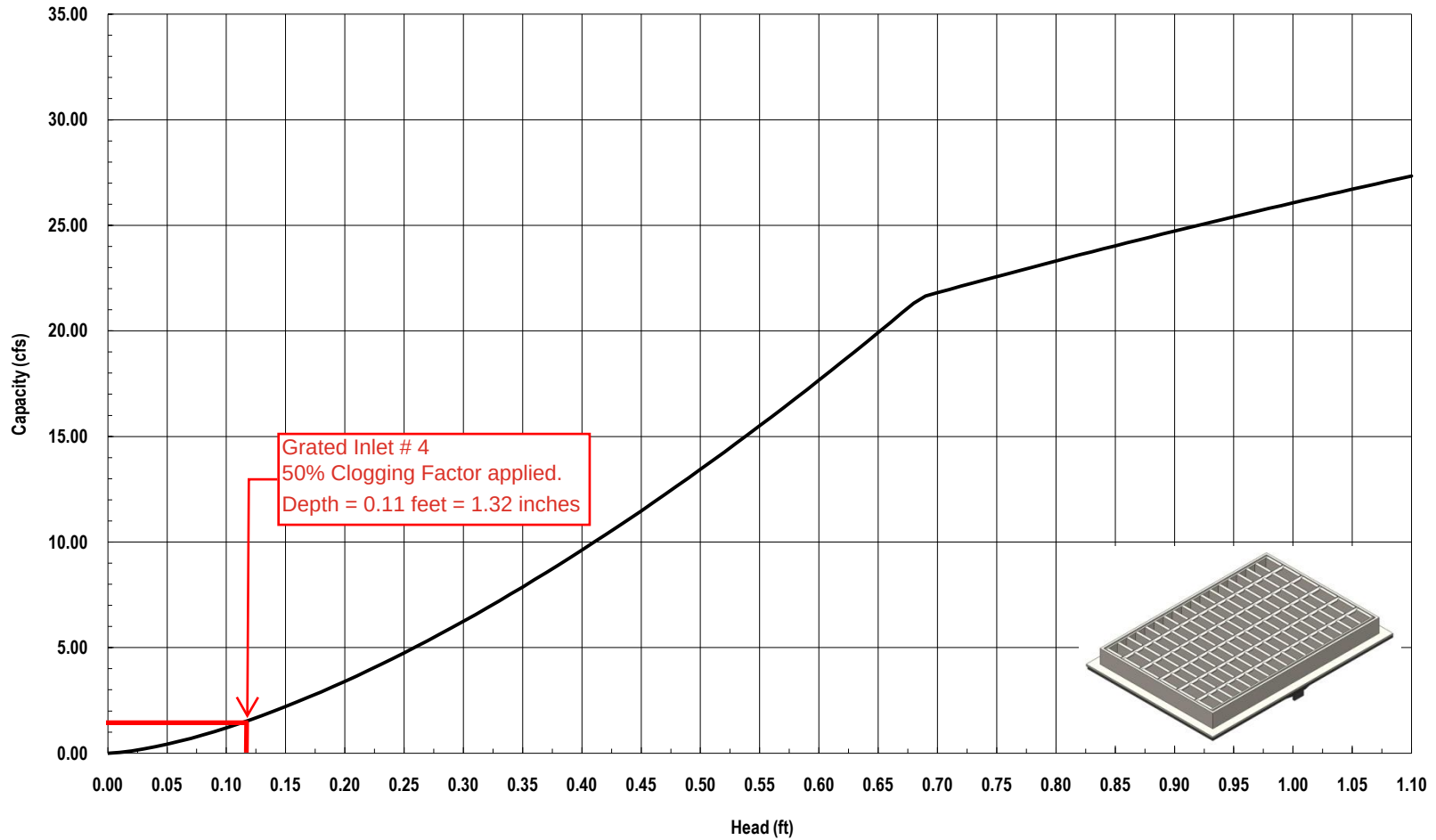
Nyloplast 2' x 3' Steel Bar / MAG Grate Inlet Capacity Chart



Nyloplast[®]

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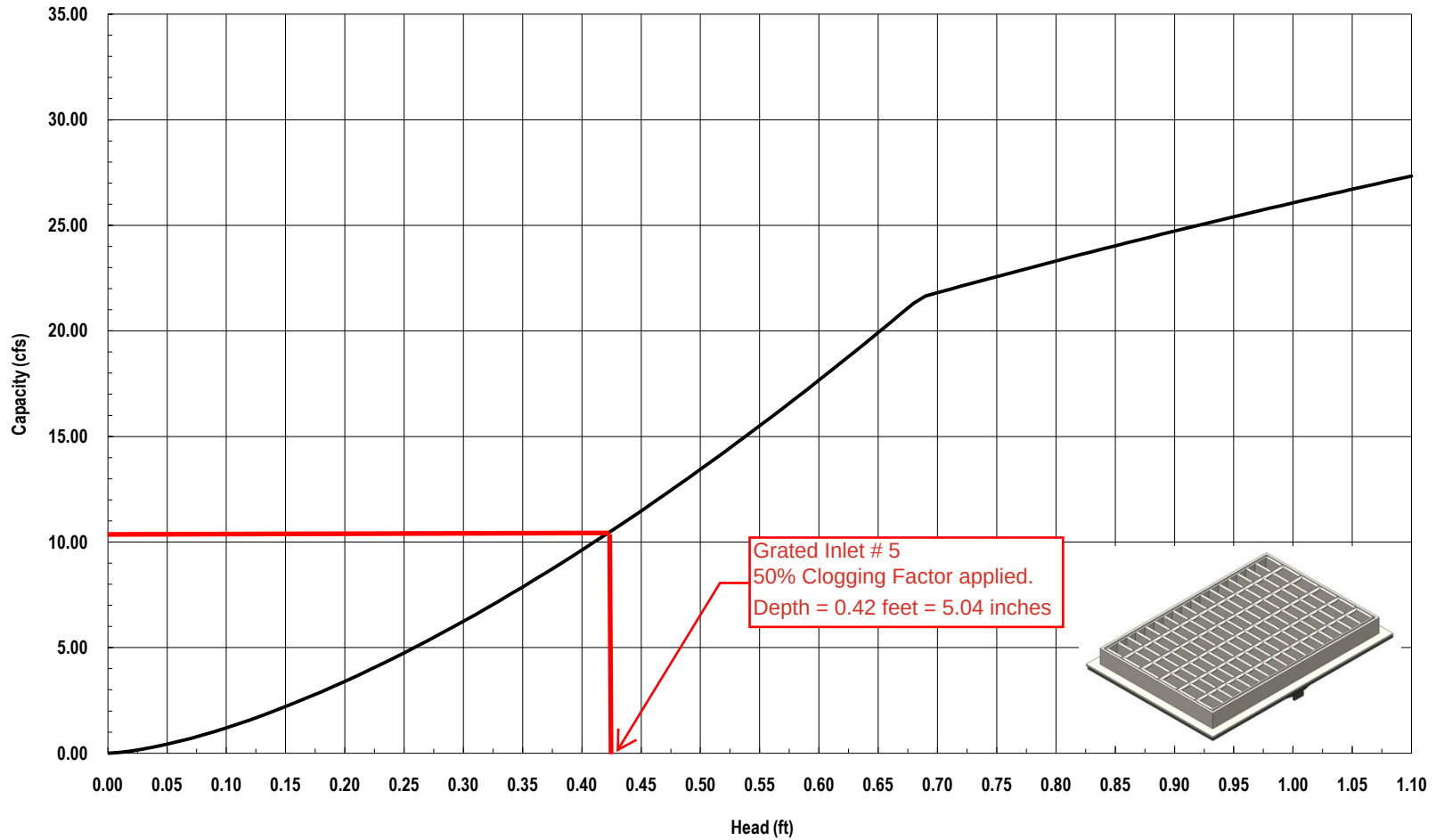
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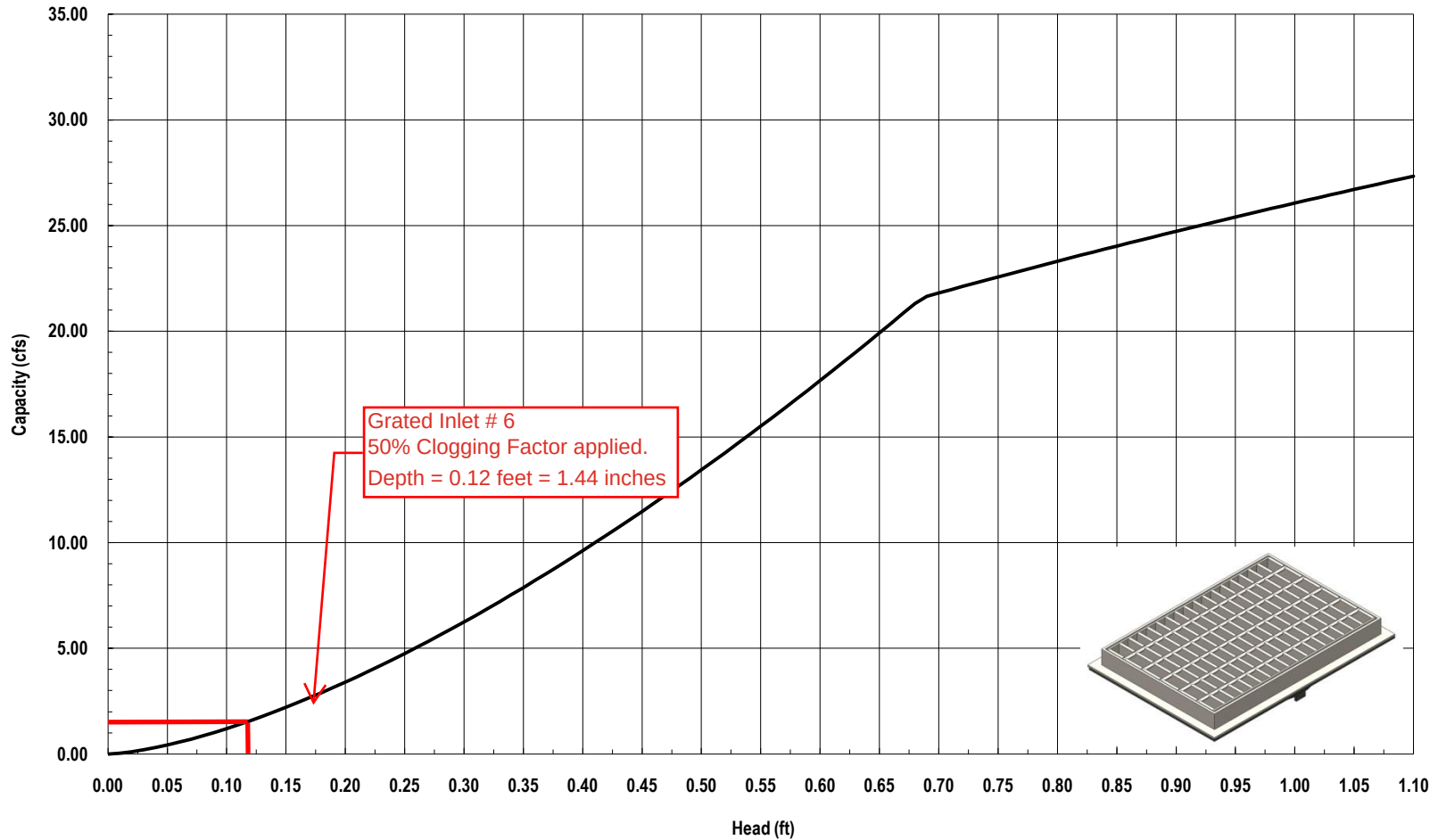
Nyloplast 2' x 3' Steel Bar / MAG Grate Inlet Capacity Chart



Nyloplast

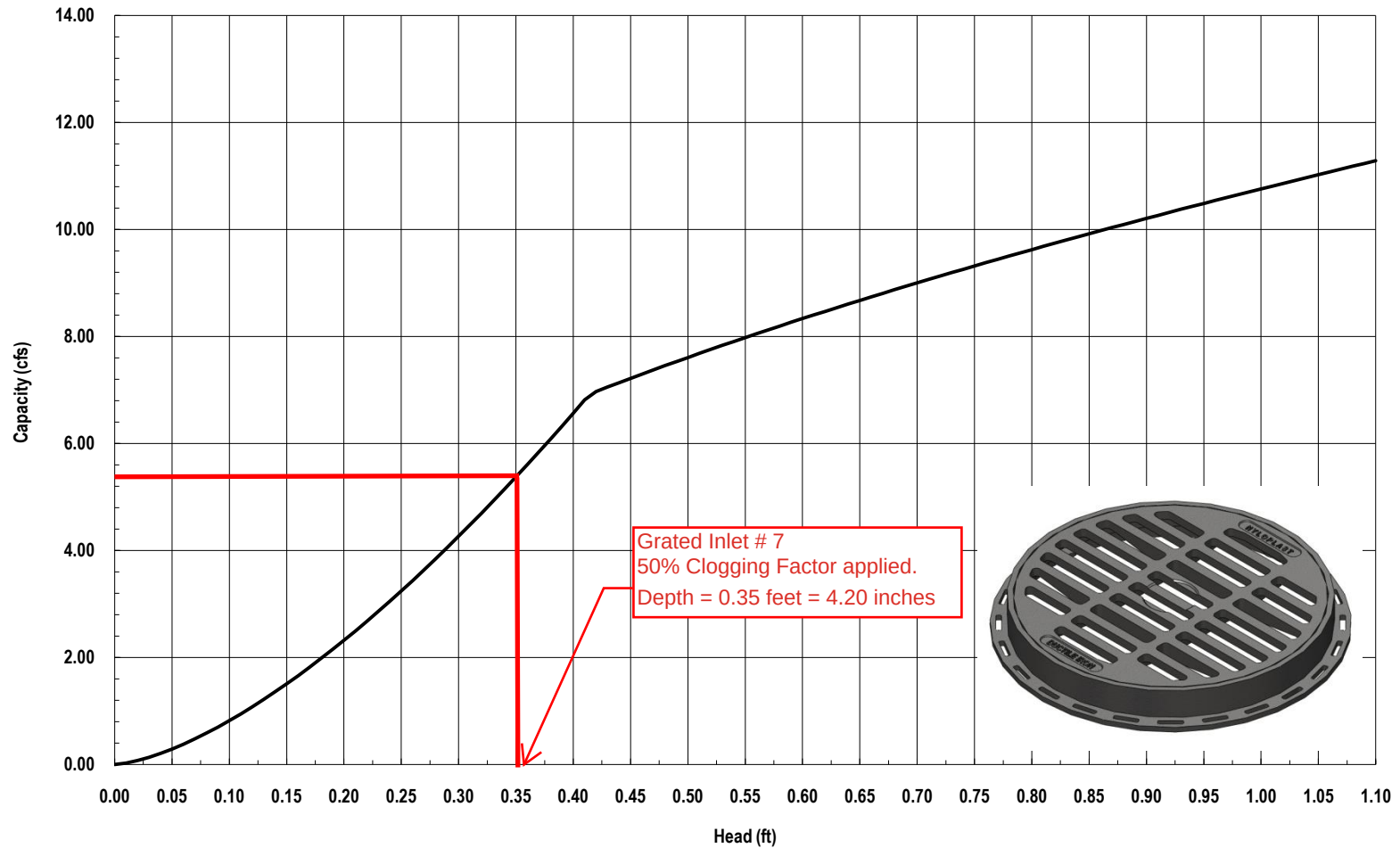
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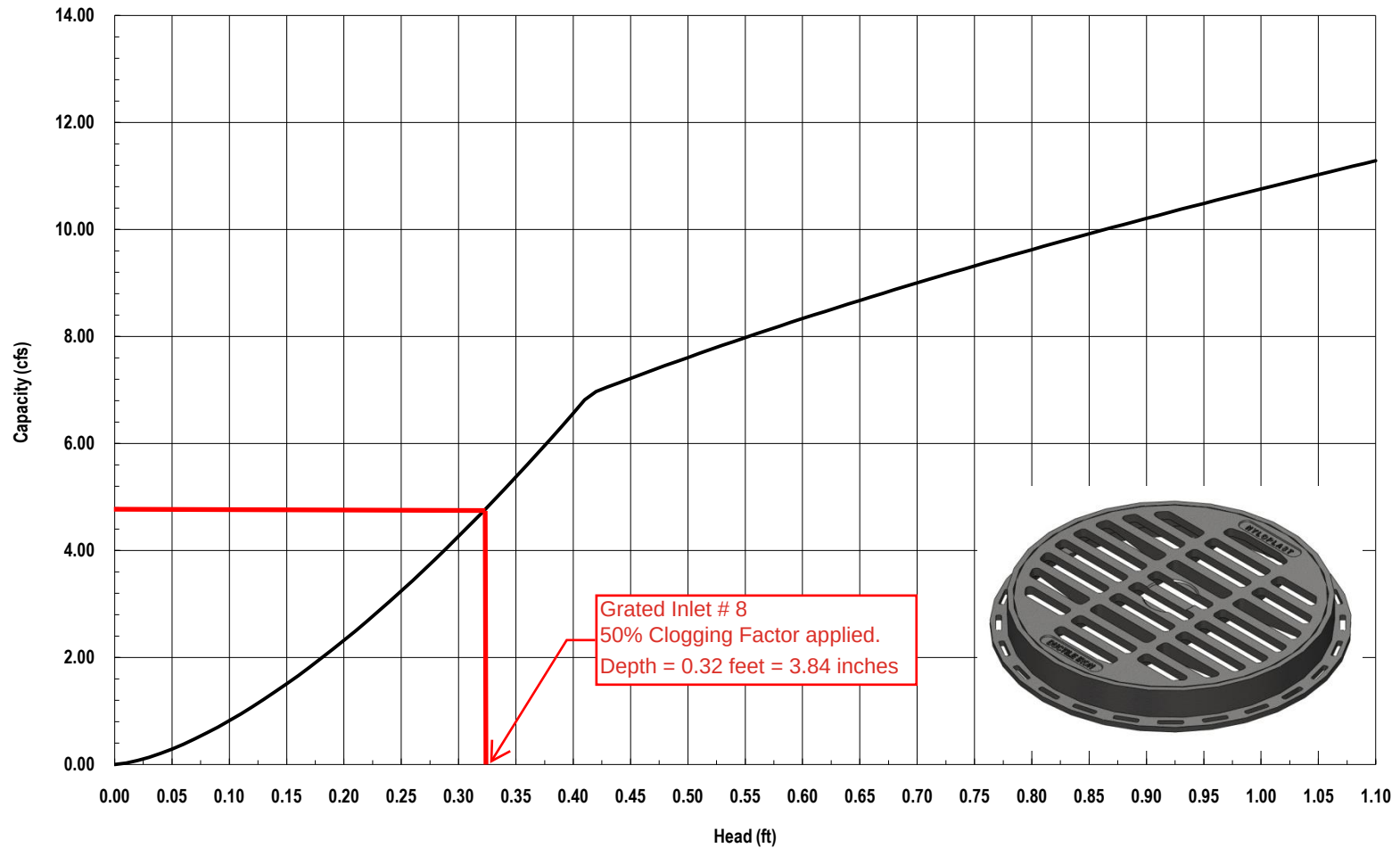
Nyloplast 30" Standard Grate Inlet Capacity Chart



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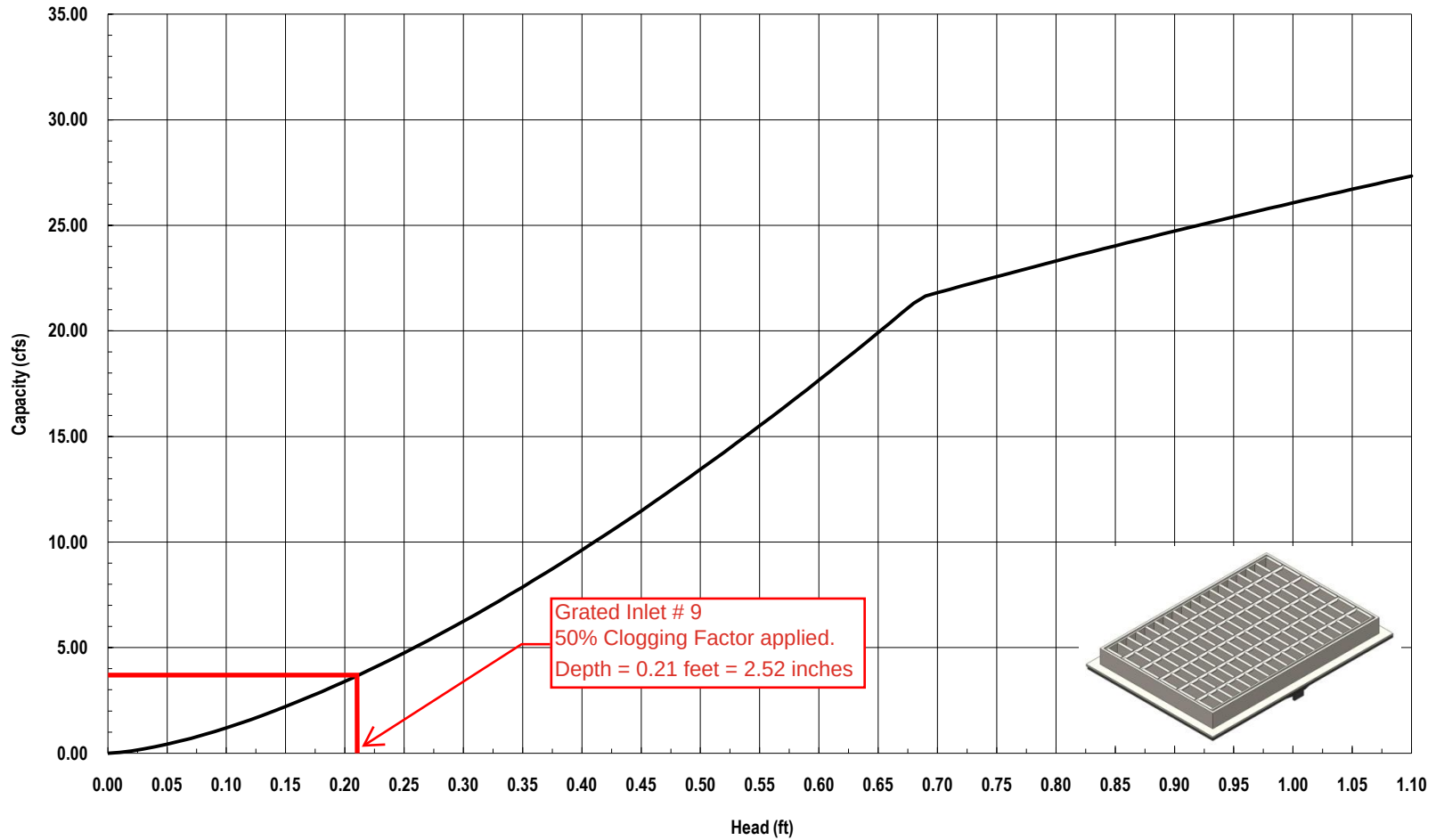
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Nyloplast 30" Standard Grate Inlet Capacity Chart



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Nyloplast 2' x 3' Steel Bar / MAG Grate Inlet Capacity Chart



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Weir Report

3 inch X 2 feet Curb Cut on Mow Curbs

Rectangular Weir

Crest = Sharp
Bottom Length (ft) = 2.00
Total Depth (ft) = 0.25

Highlighted

Depth (ft) = 0.25
Q (cfs) = 0.833
Area (sqft) = 0.50
Velocity (ft/s) = 1.67
Top Width (ft) = 2.00

Calculations

Weir Coeff. Cw = 3.33
Compute by: Q vs Depth
No. Increments = 10

Each curb cut on the mow curbs are required to drain the treatment flow of approximately 0.15 cfs per tree well. Based on this exhibit, the 3" x 2' curb cuts will drain approximately 0.83 cfs per curb cut.



Inlet Report

Curb cut on Private Road

Curb Inlet

Location	= On grade
Curb Length (ft)	= 3.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

Slope, Sw (ft/ft)	= 0.015
Slope, Sx (ft/ft)	= 0.015
Local Depr (in)	= -0-
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= 2.00
Gutter n-value	= 0.016

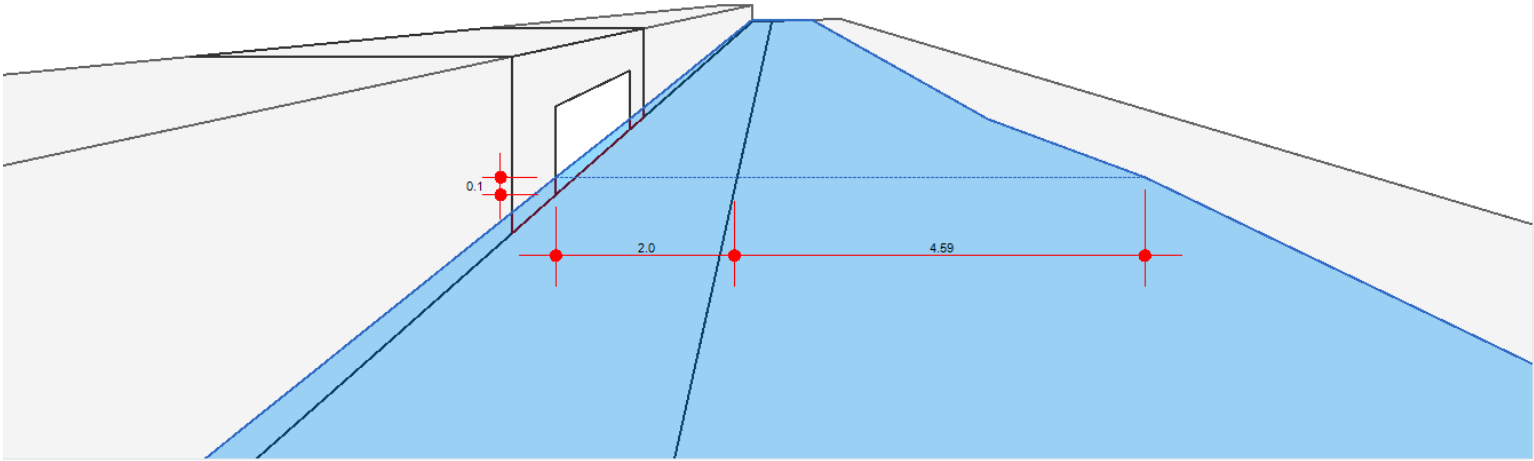
Calculations

Compute by:	Known Q
Q (cfs)	= 0.69

Highlighted

Q Total (cfs)	= 0.69
Q Capt (cfs)	= 0.15
Q Bypass (cfs)	= 0.54
Depth at Inlet (in)	= 1.19
Efficiency (%)	= 22
Gutter Spread (ft)	= 6.59
Gutter Vel (ft/s)	= 2.12
Bypass Spread (ft)	= 6.02
Bypass Depth (in)	= 1.08

All dimensions in feet



The 85th Q tributary to the tree wells on DMA-3 is approximately 0.69 cfs. Each tree well will have a 3' x 6" curb cut that will have the capacity to collect approximately 0.15 cfs. The 8 curb cuts within the tree wells will have enough capacity to collect the treatment flow.

Appendix 18

HEC-14 Rip-Rap Sizing Calculations - Rip Rap # 1

From US DOT HEC-14, July 2006:

Table 10.1. Example Riprap Classes and Apron Dimensions

Class	D ₅₀ (mm)	D ₅₀ (in)	Apron Length ¹	Apron Depth
1	125	5	4D	3.5D ₅₀
2	150	6	4D	3.3D ₅₀
3	250	10	5D	2.4D ₅₀
4	350	14	6D	2.2D ₅₀
5	500	20	7D	2.0D ₅₀
6	550	22	8D	2.0D ₅₀

¹D is the culvert rise.

Site Specific Characteristic

Q	16.56	cfs
D	2.00	ft
Tw	0.8	ft
g	32.2	ft/sec ²

Calculations Example:

Length, $L = 4D = 4(1.5) = 6$ m

Depth = $3.3D_{50} = 3.3 (0.15) = 0.50$ m

Width (at apron end) = $3D + (2/3)L = 3(1.5) + (2/3)(6) = 8.5$ m

Apron Length = 8.00 ft

Apron Depth = 1.65 ft

Apron Width = 6.83 ft

HEC-14 Rip-Rap Sizing Calculations - Rip Rap # 2

From US DOT HEC-14, July 2006:

Table 10.1. Example Riprap Classes and Apron Dimensions

Class	D ₅₀ (mm)	D ₅₀ (in)	Apron Length ¹	Apron Depth
1	125	5	4D	3.5D ₅₀
2	150	6	4D	3.3D ₅₀
3	250	10	5D	2.4D ₅₀
4	350	14	6D	2.2D ₅₀
5	500	20	7D	2.0D ₅₀
6	550	22	8D	2.0D ₅₀

¹D is the culvert rise.

Site Specific Characteristic

Q	11.60	cfs
D	1.50	ft
Tw	0.6	ft
g	32.2	ft/sec ²

Calculations Example:

Length, $L = 4D = 4(1.5) = 6 \text{ m}$

Depth = $3.3D_{50} = 3.3 (0.15) = 0.50 \text{ m}$

Width (at apron end) = $3D + (2/3)L = 3(1.5) + (2/3)(6) = 8.5 \text{ m}$

Apron Length = 6.00 ft

Apron Depth = 1.65 ft

Apron Width = 5.50 ft

HEC-14 Rip-Rap Sizing Calculations - Rip Rap # 3

From US DOT HEC-14, July 2006:

Table 10.1. Example Riprap Classes and Apron Dimensions

Class	D ₅₀ (mm)	D ₅₀ (in)	Apron Length ¹	Apron Depth
1	125	5	4D	3.5D ₅₀
2	150	6	4D	3.3D ₅₀
3	250	10	5D	2.4D ₅₀
4	350	14	6D	2.2D ₅₀
5	500	20	7D	2.0D ₅₀
6	550	22	8D	2.0D ₅₀

¹D is the culvert rise.

Site Specific Characteristic

Q	27.55	cfs
D	2.00	ft
Tw	0.8	ft
g	32.2	ft/sec ²

Calculations Example:

Length, $L = 4D = 4(1.5) = 6 \text{ m}$

Depth = $3.3D_{50} = 3.3 (0.15) = 0.50 \text{ m}$

Width (at apron end) = $3D + (2/3)L = 3(1.5) + (2/3)(6) = 8.5 \text{ m}$

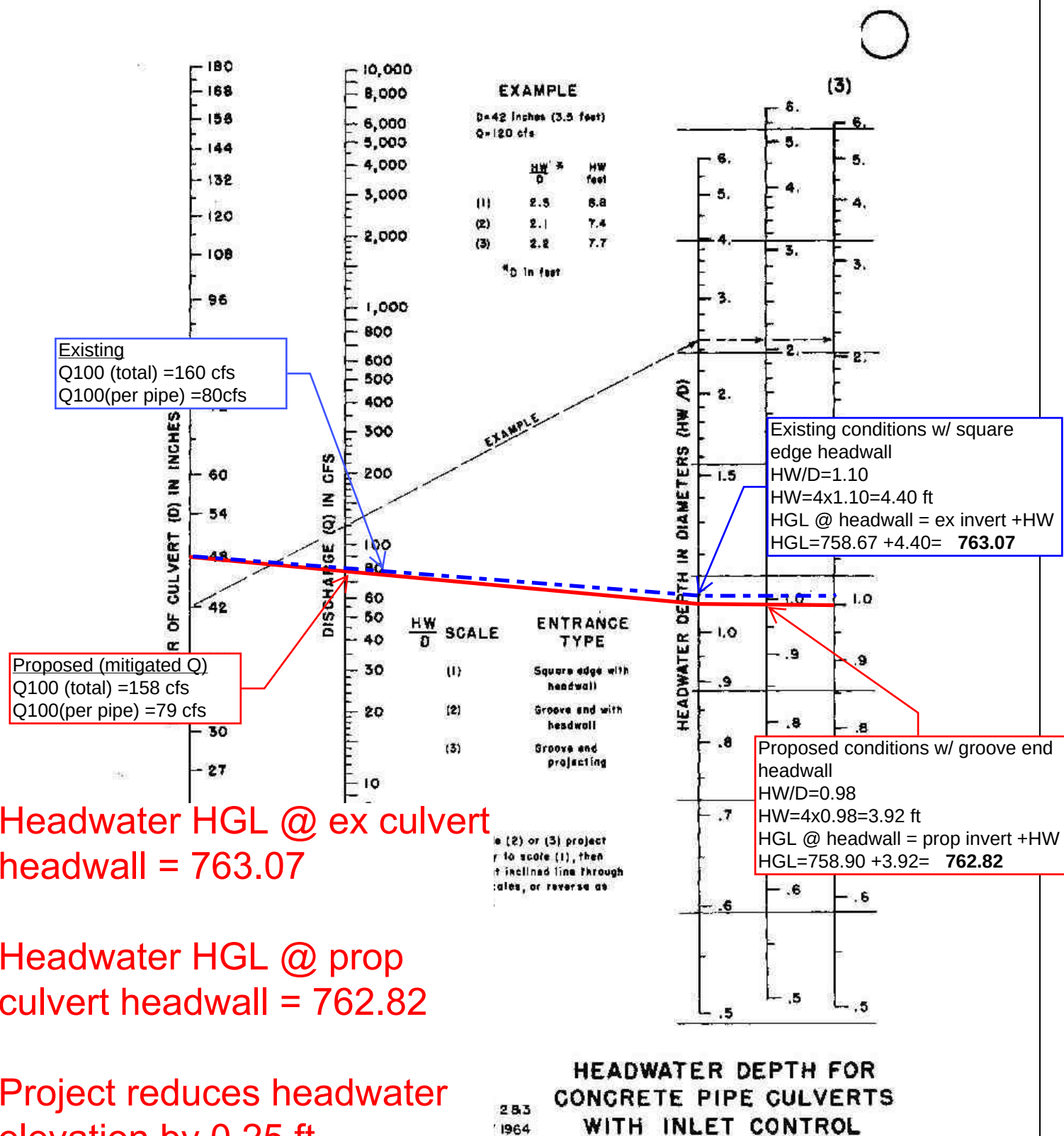
Apron Length = 8.00 ft

Apron Depth = 1.65 ft

Apron Width = 6.83 ft

Appendix 19

Figure 4-3





County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 6: Documentation of DMAs without Structural BMPs

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 or Printouts	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 <u>SSD-BMP Type(s)</u> ☐ Impervious Area Dispersion ☒ Tree Wells	- Sub-attachment 6.3 - DCV calculations from SSD-BMP tool - Dispersion Areas calculations from SSD-BMP tool - DCV calculations from SSD-BMP tool - Tree Well calculations from SSD-BMP tool	- BMPDM Section 5.2.3 (all options) - Fact Sheet SD-B (Appendix E.8) - Appendix I - Fact Sheet SD-A (Appendix E.7) - Appendix I

- Submit this cover page and all “Required Sub-attachments or Printouts” 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 (ft²)	Incidental Impervious Area		Permit # and Sheet #
		b. Size(ft²)	c. % (b/a*100)	
DMA-5	18,730	0	0	PDS2025-LDGRMJ-30561, Sheet # 17

- “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 fully 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 for every DMA listed.

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

Natural and Landscaped Areas

☒ 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.

Incidental Impervious Areas (if applicable; see above)

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 not self-mitigating if this area is 5% or greater.

6.2 De Minimis DMAs (complete this page once for ALL de minimis DMAs)

De minimis DMAs consist of areas too small to be considered significant contributors of pollutants and not practicable to drain to a BMP. They are excluded from DCV calculations. Examples include driveway aprons connecting to existing streets, portions of sidewalks, retaining walls, and similar features at the external boundaries of a project.

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

<i>DMA #</i>	<i>DMA Area (ft²)</i>	<i>Permit # and Sheet #</i>
N/A	N/A	N/A

- “DMA #”, “DMA Area”, and “Permit # and Sheet #” are required.
- Check the boxes below to confirm that each required condition is satisfied for ALL de minimis DMAs on the site.
 - ☐ Each DMA listed is less than 250 square feet and not adjacent or hydraulically connected to each other.
 - ☐ Each DMA listed fully satisfies all design requirements and restrictions described in BMPDM Section 5.2.2 De Minimis DMAs.

6.3 Self-retaining DMAs using Significant Site Design BMPs

Self-retaining DMAs use Site Design BMPs to fully-retain the entire DCV, at a minimum. Site Design BMPs that fully retain the DCV, at a minimum, therefore replacing the need for a Structural BMP (S-BMP), are classified as Significant Site Design BMPs (SSD-BMPs). To satisfy pollutant control requirements only, self-retaining means retention of the entire DCV. However, under some circumstances, a self-retaining DMA can also satisfy hydromodification management requirements by implementing BMPs that retain a greater volume of runoff.

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

DMA #	DMA Area (ft ²)	BMP Type (choose one per DMA)		Permit # and Sheet #
		Dispersion Area (Att. 6.3.1)	Tree Wells (Att. 6.3.2)	
DMA-3	20,743	☐	☒	PDS2025-LDGRMJ-30561, Sheet # 17
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

Copy and Paste table here for additional DMAs

- “DMA #”, “DMA Area”, and “Permit # and Sheet #” are required.
- Select one BMP Type per DMA. Provide detailed documentation for each DMA in Attachments 6.3.1 (Impervious Dispersion Areas) and/or 6.3.2 (Tree Wells) below.
- Each self-retaining DMA must fully satisfy all design requirements and restrictions described in BMPDM Section 5.2.3, applicable BMPDM Appendix E Fact Sheets, BMPDM Appendix I, and any other guidance or instruction identified by the County.

6.3.1 Self-retaining DMAs with Impervious Dispersion Areas

Impervious area dispersion (dispersion) refers to the practice of effectively disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops (through downspout disconnection), walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges and reduce volumes. Dispersion with partial or full infiltration results in significant volume reduction by means of infiltration and evapotranspiration. When adequately sized, dispersion can also be used to satisfy both the pollutant control and hydromodification management structural performance standards for a DMA.

- Each self-retaining DMA with impervious area dispersion must fully satisfy all design requirements and restrictions described in BMPDM Section 5.2.3, Fact Sheet SD-B: Impervious Area Dispersion, and any other guidance or instruction identified by the County.
- Documentation of compliance with all applicable conditions must be submitted with this sub-attachment using the **Summary Sheet for DMAs with Impervious Area Dispersion** on the next page. One version of this Summary Sheet must be completed for each applicable DMA.
- Applicants are responsible to comply with all other applicable requirements, regardless of whether they are included in the summary sheet.
- The following applies if the dispersion area is **native soil** (SD-B in Appendix E):
 - For pollutant control only, the DMA is considered self-retaining if the impervious to pervious ratio is:
 - 2:1 when the pervious area is composed of Hydrologic Soil Group A
 - 1:1 when the pervious area is composed of Hydrologic Soil Group B
- The following applies if the dispersion area includes **amended soil** (SD-B in Appendix E):
 - DMAs using impervious area dispersion can be considered to meet both pollutant control and hydromodification flow control requirements if the impervious to pervious area ratio is 1:1 or less and all other design requirements of SD-B are satisfied, including 11 inches of amended soil.

Summary Sheet for Self-retaining DMAs with Impervious Area Dispersion

Attach Printouts from SSD-BMP tool below

- DCV calculations from SSD-BMP tool
- Dispersion Areas calculations from SSD-BMP tool

6.3.2 Self-retaining DMAs with Tree Wells

Trees wells can provide a variety of benefits such as interception and increased infiltration of rainfall, reduced erosion, energy conservation, air quality improvement, and aesthetic enhancement. They can also be used to satisfy both pollutant control and hydromodification management performance standards for a DMA.

- Each self-retaining DMA with tree wells must fully satisfy all design requirements and restrictions described in BMPDM Section 5.2.3, Fact Sheet SD-A: Tree Wells, and any other guidance or instruction identified by the County.
- For pollutant control only, the DMA must retain the entire DCV. For hydromodification management, an additional volume must be retained in accordance with the sizing requirements presented in the DCV multiplier table in Fact Sheet SD-A.
- Documentation of compliance with applicable conditions must be submitted using the **Summary Sheet for Self-retaining DMAs with Tree Wells** on the next page. One version of this Summary Sheet must be completed for each applicable DMA.
- If both pollutant control and hydromodification standards apply, the soil depth of all tree wells in the DMA must be selected before determining the Required Retention Volume (RRV). Each tree well must be constructed to the selected depth. For pollutant control only, tree wells within a DMA may be constructed to different soil depths.
- In most cases tree wells must use Amended Soil per Fact Sheet SD-F. However, Structural Soil is required in some cases (e.g., placing the tree well next to a curb). See **Structural Requirements for Confined Tree Well Soil Volume** in Fact Sheet SD-A for additional explanation. If applicable, list the DMAs and Tree Well #s below for all tree wells requiring Structural Soil.

DMA #	Tree Wells Requiring Structural Soil (list Tree Well #s)
DMA-3	Tree-Well-1

- The Design Capture Volume (DCV) must be known for each DMA in order to determine the volume to be mitigated by the tree wells. Instructions for DCV calculation are provided in BMPDM Appendix I.1. An automated version of Worksheet I.1 (Calculation of Design Capture Volume) is available at www.sandiegocounty.gov/stormwater under the Development Resources tab.

Summary Sheet for Self-retaining DMAs with Tree Wells

Attach Printouts from SSD-BMP tool below

- DCV calculations from SSD-BMP tool
- Tree Wells calculations from SSD-BMP tool

County of San Diego Automated Worksheets for Significant Site Design BMPs (SSD-BMPs)
SD-A Tree Wells and SD-B Impervious Area Dispersion (Dispersion Areas)
(Version 1.0)

WELCOME:

Welcome to the County of San Diego Automated Worksheets for Significant Site Design BMPs. These worksheets may be used to demonstrate compliance with stormwater pollutant control standards and hydromodification flow control standards set forth in the 2013 MS4 Permit for Priority Development Projects (PDPs).

This workbook is intended for use to demonstrate compliance when significant site design BMPs (SSD-BMPs) are proposed. SSD-BMPs are passive treatment systems that include SD-A Tree Wells and SD-B Dispersion Areas. This worksheet does not support the use of underdrains in SD-A or SD-B. If underdrains are proposed, then continuous simulation modeling should be performed.

When structural BMPs (INF-1, INF-2, INF-3, PR-1, BF-1, BF-2) are proposed, a different workbook, "County of San Diego Automated Stormwater Pollutant Control Worksheets" must be used.

INSTRUCTIONS:

General: To use this workbook, navigate to each of the worksheet tabs below and populate all light green cells with project specific information. Light green cells require user input, white cells are locked for editing and are automatically calculated, bright green cells are also locked for editing and are automatically populated based on results from previous worksheet tabs, grey cells are items that do not require user input because of previous user inputs, orange cells represent warnings where supplemental information and/or revisions may be required for compliance. The worksheets are formatted to accommodate calculations for up to 10 drainage areas and associated BMPs. Each drainage area and BMP is represented as a discrete column with corresponding user inputs and calculations appearing in the rows below. Please note that projects with more than 10 drainage areas may need to use more than one workbook to accommodate the entire project.

Step 1. DCV: Provide the required inputs to determine the design capture volume (DCV) for each PDP drainage management area (DMA). The calculations in this worksheet determine the initial design capture volume and also apply any applicable reductions associated with dispersion to pervious surfaces and incorporation of rain barrels. For DMAs intended to satisfy pollutant control and hydromodification control (when applicable) requirements using Dispersion Areas alone (i.e., not in combination with Tree Wells), the data entered in this tab must provide sufficient pervious area to reduce the remaining DCV in Line 37 to zero. Note that the use of semi-pervious surfaces as dispersion area will not reduce DCV to zero, but the use of engineered pervious surfaces and/or natural pervious surfaces can. For DMAs intended to incorporate Tree Wells, the remaining DCV in Line 37 is the amount to be managed by Tree Wells.

Step 2. Dispersion Areas: [Projects that do not use Dispersion Areas skip this step and go on to Step 3.] When the project includes Dispersion Areas per SD-B, provide required inputs to demonstrate that the requirements for Dispersion Areas are satisfied. If the DMA will also use SD-A Tree Wells downstream of the Dispersion Area to satisfy pollutant control and hydromodification control (when applicable), continue to Step 3. Tree Wells.

Step 3. Tree Wells: [Projects that do not use Tree Wells do not use this Step.] When the project includes Tree Wells per SD-A, provide required inputs to demonstrate that the requirements for Tree Wells are satisfied.

DISCLAIMER:

The County of San Diego has developed this tool in an effort to streamline traditionally complex efforts associated with planning, design, submittal, and review of PDPs. While the calculations performed herein are deemed to be in compliance with 2013 MS4 Permit requirements, applicants may elect to provide their own calculations. Use of this tool is optional and the County will not be held liable for any errors or other negative impacts associated with its use. In the event that the County performs updates to these worksheets, applicants that have not established reliance on previous versions of the worksheet via discretionary approval may be required to utilize the latest version of the worksheets. A summary of version releases is included below.

QUESTIONS:

-Questions relating to specific projects, submittal requirements, approval process, and/or policy-related issues should be directed your PDS Land Development Project Manager (link below).

[PDS Land Development Project Manager](#)

-General questions/comments on this worksheet may be directed via email to BMP.Program@sdcounty.ca.gov with the subject line "SSD-BMP assistance."

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA-3	DMA-4									unitless
	2	85th Percentile 24-hr Storm Depth	0.56	0.56									inches
	3	Is Hydromodification Control Applicable?	Yes	No									yes/no
	4	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	10,503	3,318									sq-ft
	5	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)	10,240										sq-ft
	7	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	8	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	9	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	10	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
SSD-BMPs Proposed	11	Does Tributary Incorporate Dispersion and/or Rain Barrels?	No	No									yes/no
	12	Does Tributary Incorporate Tree Wells?	Yes	Yes									yes/no
Dispersion Area & Rain Barrel Inputs (Optional)	13	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)											sq-ft
	14	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	15	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	16	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	17	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)											sq-ft
	18	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)											sq-ft
	19	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Initial Runoff Factor Calculation	22	Total Tributary Area	20,743	3,318	0	0	0	0	0	0	0	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.51	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.51	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	26	Initial Design Capture Volume	494	139	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustment & Rain Barrel Adjustment	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area for DCV Reduction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.51	0.90	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	494	139	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	34	Final Adjusted Runoff Factor	0.51	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	35	Final Effective Tributary Area	10,579	2,986	0	0	0	0	0	0	0	0	sq-ft
	36	Initial Design Capture Volume Retained by Dispersion Area and Rain Barrel(s)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	37	Remaining Design Capture Volume Tributary to Tree Well(s)	494	139	0	0	0	0	0	0	0	0	cubic-feet
No Warning Messages													
DMA-4 will be treated via Green Street Standards. This County worksheet has been used to size the street BMP. Please see Attachment 13 of this SWQMP for Green Street PDP Exemption Form.													

SSD-BMP Automated Worksheet I-2: Step 2. Dispersion Area Validation (V1.0)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Dispersion Area Inputs	1	Drainage Basin ID or Name	-	-	-	-	-	-	-	-	-	-	unitless
	2	Final Design Capture Volume (DCV)	-	-	-	-	-	-	-	-	-	-	cubic-feet
	3	Is Hydromodification Control Applicable?	-	-	-	-	-	-	-	-	-	-	yes/no
	4	Total Impervious Area Dispersed to Pervious Surface	-	-	-	-	-	-	-	-	-	-	sq-ft
	5	Total Engineered Pervious Surface and/or Natural Soil Dispersion Area (Does Not Include Semi-Pervious Surfaces Serving as Dispersion Area)	-	-	-	-	-	-	-	-	-	-	sq-ft
	6	Ratio of Dispersed Impervious Area to Total Engineered Pervious Surface and/or Natural Soil Dispersion Area	-	-	-	-	-	-	-	-	-	-	unitless
	7	Dispersion Area Length (Length of Sheet Flow Across Dispersion Area)											feet
	8	Dispersion Area Slope											%
	9	Thickness of Amended Soil											inches
	10	How is Flow Dispersed Across Width of Dispersion Area (definitions below*)?											unitless
Results	11	Is DCV Requirement Fully Satisfied by Dispersion Area?	-	-	-	-	-	-	-	-	-	-	yes/no
	12	Is Hydromodification Control Requirement Satisfied by Dispersion Area?	-	-	-	-	-	-	-	-	-	-	yes/no
	13	Are Dispersion Area Length, Slope, and Thickness of Amended Soil (when applicable) Adequate?	-	-	-	-	-	-	-	-	-	-	yes/no
No Warning Messages													

Notes:

***How is Flow Dispersed Across Width of Pervious Dispersion Area?**

Sheet Flow: Flow arrives as sheet flow across the width of the adjacent impervious area

Spreader(s): Flow is discharged from flow spreader(s) across the width of the pervious area

Roof Drains: Discharge from roof drains distributed across the width of the pervious area

Curb Cuts: Discharge from curb cuts distributed across the width of the pervious area

Other: Other (Describe in PDP SWQMP)

SSD-BMP Automated Worksheet I-3: Step 3. Tree Well Sizing (V1.0)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Tree Well Inputs	1	Drainage Basin ID or Name	DMA-3	DMA-4	-	-	-	-	-	-	-	-	unitless
	2	Design Capture Volume Tributary to BMP	494	139	-	-	-	-	-	-	-	-	cubic-feet
	3	Is Hydromodification Control Applicable?	Yes	No	-	-	-	-	-	-	-	-	yes/no
	4	Predominant NRCS Soil Type Within Tree Well(s) Location	D	D									unitless
	5	Select a Tree Species for the Tree Well(s) Consistent with SD-A Tree Palette Table Note: Numbers shown in list are Tree Species Mature Canopy Diameters	20' - Catalina Cherry	20' - Catalina Cherry									unitless
	6	Tree Well(s) Soil Depth (Installation Depth) Must be 30, 36, 42, or 48 Inches; Select from Standard Depths**	30	30									inches
	7	Number of Identical* Tree Wells Proposed for this DMA	8	1									trees
	8	Proposed Width of Tree Well(s) Soil Installation for One (1) Tree	10.0	10.0									feet
	9	Proposed Length of Tree Well(s) Soil Installation for One (1) Tree	25.1	25.1									feet
Tree Data	10	Botanical Name of Tree Species	Prunus Lynoii	Prunus Lynoii	-	-	-	-	-	-	-	-	unitless
	11	Tree Species Mature Height per SD-A	40	40	-	-	-	-	-	-	-	-	feet
	12	Tree Species Mature Canopy Diameter per SD-A	20	20	-	-	-	-	-	-	-	-	feet
	13	Minimum Soil Volume Required In Tree Well (2 Cubic Feet Per Square Foot of Mature Tree Canopy Projection Area)	628	628	-	-	-	-	-	-	-	-	cubic-feet
	14	Credit Volume Per Tree	180	180	-	-	-	-	-	-	-	-	cubic-feet
Tree Well Sizing Calculations	15	DCV Multiplier To Meet Flow Control Requirements	2.90	n/a	-	-	-	-	-	-	-	-	unitless
	16	Required Retention Volume (RRV) To Meet Flow Control Requirements	1433	n/a	-	-	-	-	-	-	-	-	cubic-feet
	17	Number of Trees Required	8	1	-	-	-	-	-	-	-	-	trees
	18	Total Area of Tree Well Soil Required for Each Tree	251	251	-	-	-	-	-	-	-	-	sq-ft
	19	Approximate Required Width of Tree Well Soil Area for Each Tree	16	16	-	-	-	-	-	-	-	-	feet
	20	Approximate Required Length of Tree Well Soil Area for Each Tree	16	16	-	-	-	-	-	-	-	-	feet
	21	Number of Trees Proposed for this DMA	8	1	-	-	-	-	-	-	-	-	trees
	22	Total Area of Tree Well Soil Proposed for Each Tree	251	251	-	-	-	-	-	-	-	-	sq-ft
	23	Minimum Spacing Between Multiple Trees To Meet Soil Area Requirements (when applicable)***	25.1	n/a	-	-	-	-	-	-	-	-	feet
Results	24	Are Tree Well Soil Installation Requirements Met?	Yes	Yes	-	-	-	-	-	-	-	-	yes/no
	25	Is Remaining DCV Requirement Fully Satisfied by Tree Well(s)?	Yes	Yes	-	-	-	-	-	-	-	-	yes/no
	26	Is Hydromodification Control Requirement Satisfied by Tree Well(s)?	Yes	n/a	-	-	-	-	-	-	-	-	yes/no
No Warning Messages													
DMA-4 will be treated via Green Street Standards. This County worksheet has been used to size the street BMP. Please see Attachment 13 of this SWQMP for Green Street PDP Exemption Form.													

Notes:
*If using more than one mature canopy diameter within the same DMA, only the smallest mature canopy diameter should be entered. Alternatively, if more than one mature canopy diameter is proposed and/or the dimensions of multiple tree well installations will vary, separate DMAs may be delineated.
**If the actual proposed installation depth is not available in the table of standard depths, select the next lower depth.
***Tree Canopy or Agency Requirements May Also Influence the Minimum Spacing of Trees.



County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 7: Documentation of DMAs with Structural Pollutant Control BMPs

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 Fallbrook Self Storage
Permit Application Number PDS2025-STP-25-008

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).

P.E. #83583, Expires 3-31-2027

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

Patric T. de Boer

Print Name

Omega Engineering Consultants

Company

Engineer's Seal:

Date

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.

The strategy for structural BMP implementation followed the criteria laid out in Section 5.1 of the BMP Design Manual. After determining the DCV, a capture and use analysis found capture and use to be infeasible due to the low demand for landscape irrigation.

The soil type selected for the site is Soil Type D. This was corroborated by the infiltration rates provided by the Geotechnical Investigation prepared by Geocon Incorporated on June 5, 2024. The Geotechnical Investigation concluded the site is underlain by existing alluvium and granitic rocks which provided a very low average rate of 0.009 inches per hour (with a safety factor of 2). Even though the Web Soil Survey states that the site is underlain by Type B and C soils, we believe that based on the low infiltration rates, type D soil is more representative of the onsite soils. In addition, the infiltration rate of 0.009 inches per hour is more representative of Type D soils per the County of San Diego BMP Design Manual, Table B.2-3. Therefore, infiltration is restricted, and lined biofiltration basins have been proposed instead.

Worksheets B.1 through B.3 have been filled out to determine the required DCV for treatment and retention for DMA-1 and DMA-2, as well as to evaluate the BMP performance of the proposed BMP-1 and BMP-2. Please see the attached worksheets for the calculations.

The pollutant control biofiltration basins have been integrated with the hydromodification flow control BMP.

The southerly portion of the westerly private road will be treated via eight (8) 20-foot diameter trees. The tree sizing for this area will include an HMP multiplier to satisfy the HMP requirements. This area will be excluded from the Hydromodification analysis provided on Attachment 8.

The improvements being made along the northerly portion of the road cannot physically drain to the proposed biofiltration basins or the onsite tree wells. For this reason, we have explored the option of adding a Green Street BMP to treat the portion of the net increase in impervious area (per County of San Diego BMPDM, Chapter 1.4.3 and Appendix K.2.1). The project qualifies for the PDP exemption as it is retrofitting an existing paved road. Please refer to Attachment 13 for additional details. This area will be excluded from the Hydromodification analysis provided on Attachment 8.

Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods for Structural BMPs

The following table summarizes public data sources available for the infiltration restriction analysis.

Table B.2-2: Public Data Sources for Infiltration Restriction Analysis

Resources	Description
Geotracker	Website: geotracker.waterboards.ca.gov Reference Layers: Groundwater Depths, Contaminated Sites/Soils
SANGIS	Website: sangis.org Reference Layers: Land Use Current, Gas Stations, Wells, Groundwater Basins, Flowlines, Liquefaction, Soils, Steep Slopes, Sewer, Topography, Elevation Grids
Web Soil Survey (NRCS Soil Type)	Website: websoilsurvey.sc.egov.usda.gov/App Reference Layers: Hydrologic Soil Group, Map Unit Names
Watershed Management Area Analysis	Website: projectcleanwater.org/watershed-management-area-analysis-wmaa Reference Layers: Electronic Data from Appendix C of WMAA
Survey Records System	Website: srs.sandiegocounty.gov Reference Layers: Grading Plans, Surveys, Drainage Plans, Topography Maps, Tentative Parcel Maps
Applicant Plans	Website: n/a Reference Layers: Utility Plans, Grading Plans, Existing Site Conditions, Proposed Site Conditions, Nearby geotechnical reports.
Geotechnical Engineer	Website: n/a Reference Layers: At discretion of Geotechnical Engineer

B.2.3 Step 2C – Design Infiltration Rate

The design infiltration rate for each drainage area must be determined through either a basic or advanced analysis. The basic analysis allows the SWQMP Preparer to assign a default design infiltration rate based on the predominant NRCS soil type present within the proposed BMP footprint. The advanced analysis allows for a geotechnical engineer to assign a more specific design infiltration rate based on field testing outlined in Appendix D. Table B.2-3 below identifies the design infiltration rates that can be used for each analysis. Please note that the basic analysis is not permitted for BMPs that lack an underdrain.

Table B.2-3: Design Infiltration Rate

Infiltration Restrictions	Design Infiltration Rate (in/hr)	
	Option 1: Basic Analysis	Option 2: Advanced Analysis
Unrestricted	Type A Soil = 0.300	Rate recommended by geotechnical engineer (Reference Appendix D)
Unrestricted	Type B Soil = 0.200	
Unrestricted	Type C Soil = 0.100	
Unrestricted	Type D Soil = 0.025	
Restricted	Any Soil = 0.000	0.000

B.2.4 Step 2D - Retention Requirement

Using information determined in previous steps, the retention requirement can now be determined. Retention requirement is the percentage of annual runoff that must be retained within the drainage area.

The Geotechnical Investigation performed infiltration testing with the resulting infiltration being of 0.009 inches/hour. Per this table, the resulting infiltration rate is more representative of Type D soils.



County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 7: Documentation of DMAs with Structural Pollutant Control BMPs

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

7.2.2 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.

- [illegible]

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-1	Permit # and Sheet #	PDS2025-LDGRMJ-30561 Sheet #17-19		
BMP Type					
Infiltration ☐ Infiltration basin (INF-1) ☐ Bioretention (INF-2) ☐ Permeable pavement (INF-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			
Unlined Biofiltration ☐ Biofiltration with partial retention (PR-1)		Hydromodification Management ³ ☐ Detention pond or vault ☐ Other (describe below)			
Lined Biofiltration ☒ Biofiltration (BF-1) ☒ Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3)					
BMP Purpose					
☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification		☐ Pre-treatment/forebay for another BMP ☐ Green Street 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		Andrew Kann Omega Engineering Consultants, Inc. (858) 333-8340 ext. 11			
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 ☐ Other (describe):		☒ Property Owner ☐ County		
Maintenance of BMP into perpetuity	☐ HOA ☐ Other (describe):		☒ Property Owner ☐ County		
Discussion (As needed; Continue on subsequent pages as necessary)					

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-2	Permit # and Sheet #	PDS2025-LDGRMJ-30561 Sheet #17-19		
BMP Type					
Infiltration ☐ Infiltration basin (INF-1) ☐ Bioretention (INF-2) ☐ Permeable pavement (INF-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			
Unlined Biofiltration ☐ Biofiltration with partial retention (PR-1)		Hydromodification Management ³ ☐ Detention pond or vault ☐ Other (describe below)			
Lined Biofiltration ☒ Biofiltration (BF-1) ☒ Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3)					
BMP Purpose					
☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification		☐ Pre-treatment/forebay for another BMP ☐ Green Street 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		Andrew Kann Omega Engineering Consultants, Inc. (858) 333-8340 ext. 11			
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 ☐ Other (describe):		☒ Property Owner ☐ County		
Maintenance of BMP into perpetuity	☐ HOA ☐ Other (describe):		☒ Property Owner ☐ County		
Discussion (As needed; Continue on subsequent pages as necessary)					

Copy and Paste table here for additional BMPs

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

7.5 Identification and Narrative of Receiving Water and Pollutants of Concern

- Complete this sub-attachment *only if flow-thru treatment BMPs are implemented onsite* in lieu of retention or biofiltration BMPs. Unless excepted because of a Prior Lawful Approval⁴, PDPs must also participate in an alternative compliance program⁵.

A. General Description

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable).

N/A

B. Water Body Impairments and Priorities

List any 303(d) impaired water bodies⁶ within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP
		Highest Priority Pollutant

C. Identification of Project Site Pollutants

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix J.5)

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

⁴ See BMPDM Appendix L: Prior Lawful Approval Requirements and Guidance.

⁵ See SWQMP Attachment 12 (Alternative Compliance Projects) and BMPDM Appendix J (Offsite Alternative Compliance Requirements and Guidance).

⁶ The current list of Section 303(d) impaired water bodies can be found at:

https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml

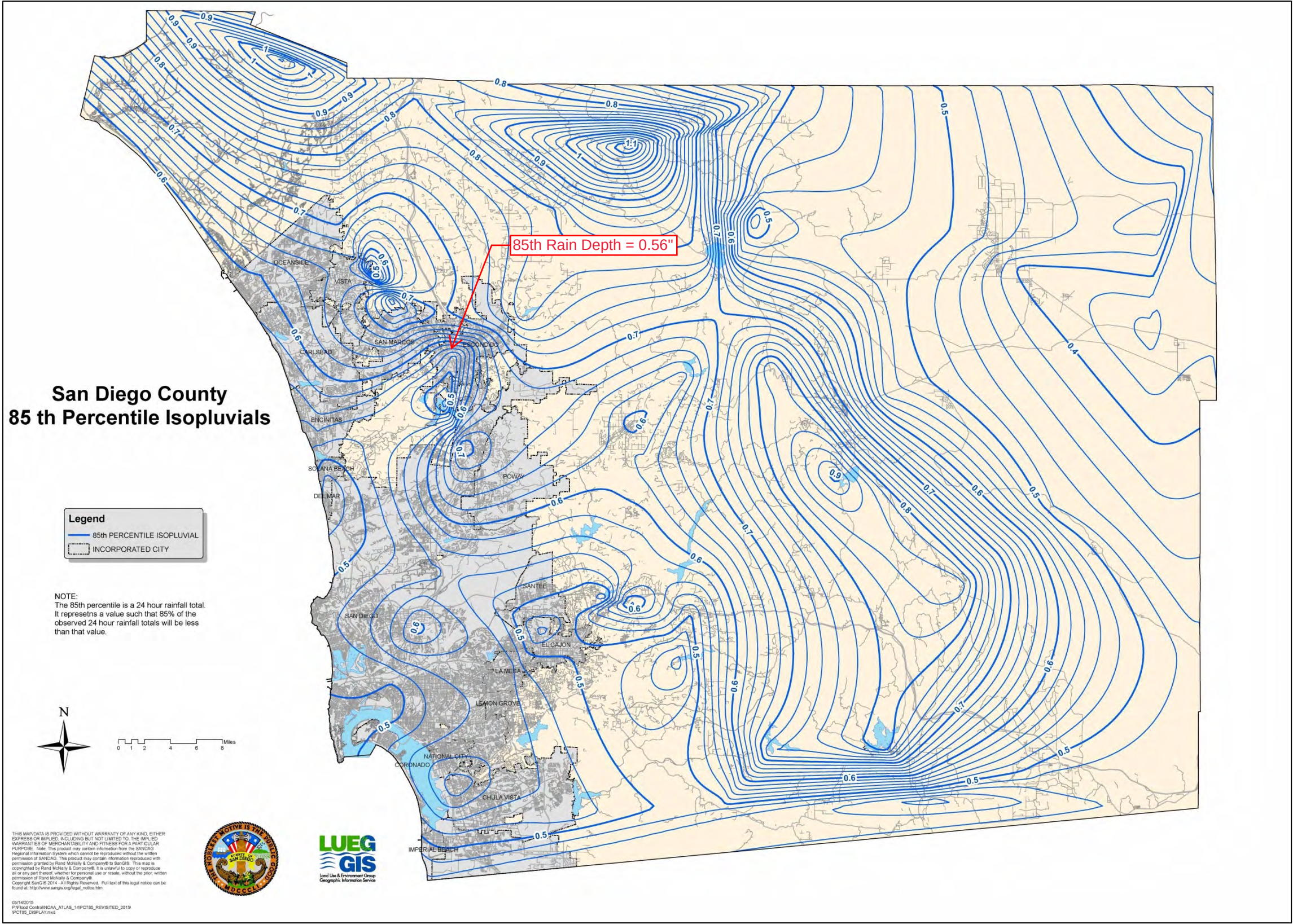


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

County of San Diego Automated Stormwater Pollutant Control Worksheets (Version 2.0)

WELCOME:

Welcome to the County of San Diego Automated Stormwater Pollutant Control Worksheets. These worksheets may be used to demonstrate compliance with stormwater pollutant control standards set forth in the 2013 MS4 Permit for Priority Development Projects and Green Street Projects.

INSTRUCTIONS:

General: To use this workbook, navigate to each of the worksheet tabs below and populate all yellow cells with project specific information. Yellow cells require user input, white cells are locked for editing and are automatically calculated, blue cells are also locked for editing and are automatically populated based on results from previous worksheet tabs, grey cells are items that do not require user input because of previous user inputs, orange cells represent warnings where supplemental information and/or revisions may be required for compliance. The worksheets are formatted to accommodate calculations for up to 10 drainage areas and associated BMPs. Each drainage area and BMP is represented as a discrete column with corresponding user inputs and calculations appearing in the rows below. Please note that projects with more than 10 drainage areas may need to use more than one workbook to accommodate the entire project.

Step 1. DCV: Provide the required inputs to determine the design capture volume for each PDP drainage area. The calculations in this worksheet determine the initial design capture volume and also apply any applicable reductions associated with site design techniques including dispersion to pervious surfaces, incorporation of tree wells, and incorporation of rain barrels.

Step 2. Retention Requirements: Provide required inputs to determine the minimum retention requirements for each drainage area.

Step 3. BMP Performance: Provide required inputs to determine the portion of the pollutant control performance standards that are satisfied by the proposed BMPs.

Reduced Size BMP Maintenance (optional): If BMPs with a footprint of less than 3% of the effective impervious tributary are proposed, provide required inputs to determine the anticipated frequency for major BMP maintenance activities.

DISCLAIMER:

The County of San Diego has developed this tool in an effort to streamline traditionally complex efforts associated with planning, design, submittal, and review of PDPs that are subject to stormwater pollutant control requirements set forth in the 2013 MS4 Permit. While the calculations performed herein are deemed to be in compliance with Permit requirements, applicants may elect to provide their own calculations. Use of this tool is optional and the County will not be held liable for any errors or other negative impacts associated with its use. In the event that the County performs updates to these worksheets, applicants that have not established reliance on previous versions of the worksheet via discretionary approval may be required to utilize the latest version of the worksheets. A summary of version releases is included below.

QUESTIONS:

-Questions relating to specific projects, submittal requirements, approval process, and/or policy-related issues should be directed your PDS Land Development Project Manager (link below).

[PDS Land Development Project Manager](#)

-General questions/comments on this worksheet may be directed to Charles Mohrlock in the County of San Diego Watershed Protection Program (link below).

charles.mohrlock@sdcounty.ca.gov

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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA-1	DMA-2									unitless
	2	85th Percentile 24-hr Storm Depth	0.56	0.56									inches
	3	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	102,193	69,544									sq-ft
	4	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)	16,531	19,729									sq-ft
	6	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	7	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	8	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	9	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No									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	118,724	89,273	0	0	0	0	0	0	0	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.79	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.79	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	26	Initial Design Capture Volume	4,377	3,000	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.79	0.72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	4,377	3,000	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.79	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	36	Final Effective Tributary Area	93,792	64,277	0	0	0	0	0	0	0	0	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	4,377	3,000	0	0	0	0	0	0	0	0	cubic-feet
No Warning Messages													

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

[illegible]

No Warning Messages

Automated Worksheet B.4: Reduced Size BMP Maintenance Interval (V2.0)

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Drainage Basin Info	1	Drainage Basin ID or Name	DMA-1	-	-	-	-	-	-	-	-	-	unitless
	2	Final Effective Tributary Area	93,792	-	-	-	-	-	-	-	-	-	sq-ft
	3	Provided BMP Surface Area	2,450	-	-	-	-	-	-	-	-	-	sq-ft
Biofiltration Clogging Inputs	4	Average Annual Precipitation	10.0										inches
	5	Load to Clog (default =2.0)	2.0										lb/sq-ft
	6	TSS Pretreatment Efficacy	0.00										yes/no
	7	Percentage "Commercial"	50%										percentage
	8	Percentage "Education"											percentage
	9	Percentage "Industrial"											percentage
	10	Percentage "Low Traffic Areas"											percentage
	11	Percentage "Multi-Family Residential"											percentage
	12	Percentage "Roof Areas"	50%										percentage
	13	Percentage "Single Family Residential"											percentage
	14	Percentage "Transportation"											percentage
	15	Percentage "Vacant/Open Space"											percentage
	16	Percentage "Steep Hillslopes"											percentage
Result	17	Total Percentage of Above Land Uses	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	percentage
	18	Average TSS Concentration for Tributary After Pretreatment	58	0	0	0	0	0	0	0	0	0	mg/L
	19	Average Annual Runoff Volume	78,160	0	0	0	0	0	0	0	0	0	cubic-feet
	20	Average Annual TSS Load	283	0	0	0	0	0	0	0	0	0	lb/yr
	21	Available Sediment Storage within BMP	4,900	0	0	0	0	0	0	0	0	0	lb
	22	Anticipated Major Maintenance Frequency	17.3	-	-	-	-	-	-	-	-	-	years
No Warning Messages													
Per the County of San Diego BMPDM, Appendix B, Section B.4.1.3, the anticipated major maintenance frequency must be 10 years or greater to be compliant. The Reduced Size BMP Maintenance calculations for result in 10 years, therefore the proposed biofiltration basins are compliant.													



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 0.1Q ₂ (default low flow threshold) ☐ Yes (provide the information below): Low flow threshold: ☐ 0.1Q ₂ ☐ 0.3Q ₂ ☐ 0.5Q ₂ 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.

8.1 Flow Control Facility Design

Insert Flow Control Facility Design behind this cover page or submit as a separate stand-alone document labeled Sub-attachment 8.1.

Please see the attached flow control designs for the proposed biofiltration basins.

Hydromodification Analysis Fallbrook Self Storage

1305 East Mission Road
Fallbrook, CA 92028
APN: 105-410-18-00

Date Prepared:

June 16, 2026

Prepared for:

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Prepared By:



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Patric T. de Boer
Registration Expires

RCE 83583
3-31-2027



Introduction

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

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

SWMM Model Development

The predeveloped site drains to a single Point of Compliance (POC). POC-1 is located on an existing culvert along the northwesterly corner of the site. Both the pre and post-developed conditions were modeled side by side, within a single SWMM model.

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

Catchment Modeling

For the pre-developed conditions, the underlying soil is modeled as Type 'D' soil. This determination is based off the County of San Diego Hydrology Manual Soil Hydrologic Groups Exhibit.

The pre-developed catchment condition was modeled by estimating the slope conditions prior to the construction of the existing development. The slope was estimated by determining the slope of a line drawn from the highest point to the lowest point of the site.

The post-developed catchment condition was modeled based on the project design that is proposed. The proposed catchment is modeled as being underlain by hydrologic group 'C' soil. This is in accordance with section G.1.4.3 of the BMP design manual, which allows re-tilled/landscaped areas to be modeled as group 'C'. This accounts for the additional retention provided by landscaping that will be used on the pervious portions of the site.

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

Condition	Suction Head	Conductivity	Initial Deficit
Pre-developed	9.0	0.025	0.30
Post-developed	6.0	0.10	0.31

Surface Parameters from Table G.1-4 of City BMP Design Manual									
	Catchment	Area	Width	Slope	% Imperv	N- Imperv	N- Perv	Dstore Imperv	Dstor Perv
Pre	E-DMA-1	5.20	2267	10	0	0.012	0.15	0.05	0.10
	E-OFF-1	2.83	100	10	0	0.012	0.15	0.05	0.10
Post	DMA-1	2.73	1187	0.5	86	0.012	0.15	0.05	0.10
	DMA-2	2.05	893	1.0	78	0.012	0.15	0.05	0.10
	DMA-5	0.43	187	1.0	0	0.012	0.15	0.05	0.10
	P-OFF-1	2.83	100	10	0	0.012	0.15	0.05	0.10

The area, width, slope, and % impervious were all determined from the site-specific conditions. N- The Perv, Imperv, Dstor Imperv and Dstor Perv were taken from table G.1-4 of the County of San Diego BMP Design Manual. These are the default values suggested by the manual.

The width of the catchments is determined by dividing the catchment area by the overland flow path length.

The subcatchments E-OFF-1 and P-OFF-1 correspond to the offsite areas that are bypassed by the project site. They have been added on the SWMM HMP model.

Detention Facility Modeling

In the post-developed conditions, two lined biofiltration basins will be constructed. Each will be built with low flow orifice on the perforated subdrain and a Nyloplast dome grate outlet riser above the treatment ponding. The low flow orifices will be modelled as orifice links in the SWMM model. The risers are modeled as outlet links with a rating curve applied to them. The rating curve is specific to the geometry of the dome grates, and the flow reduction they provide is used as a restricting element of the BMPs. The rating curves are provided by the manufacturer of the grates. See below for orifice and riser characteristics per basin:

- BMP-1: 2" Side Orifice @ 0' offset; 12" Nyloplast Dome Grate @ 3.50' offset
- BMP-2: 1 1/2" Side Orifice @ 0' Offset; 12" Nyloplast Dome Grate @ 3.50' offset

The biofiltration basins will be modelled as storage nodes that will include all of the storage elements of the facility. The storage elements include 12" of rock layer (includes 9" ASTM No. 57 stone & 3" ASTM No. 8 stone), 21" treatment soil (includes 3" ASTM C33 fine aggregate sand & 18" bioretention soil), 9" treatment ponding (includes 3" mulch & 6" treatment ponding), and 33" of max surface ponding.

BMP-1 Area = 2450 sf

Storage Curve Editor

Curve Name
BMP-1

Description

	Depth (ft)	Area (ft2)
1	0	980
2	1.0	980
3	1.0001	490
4	2.75	490
5	2.750001	2450
6	3.50	2860
7	4.50	3700
8	5.50	4605
9		
10		
11		

View... Load... Save... OK Cancel Help

BMP-2 Area = 1940 sf

Storage Curve Editor

Curve Name
BMP-2

Description

	Depth (ft)	Area (ft2)
1	0	776
2	1.0	776
3	1.00001	388
4	2.75	388
5	2.750001	1940
6	3.50	2405
7	4.50	3370
8	5.50	4390
9		
10		
11		

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Flow Duration Curve Comparison

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

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

Summary

This analysis has found that the proposed underground storage facility will provide sufficient storage and flow attenuation properties to ensure that the proposed project will meet the current HMP requirements.

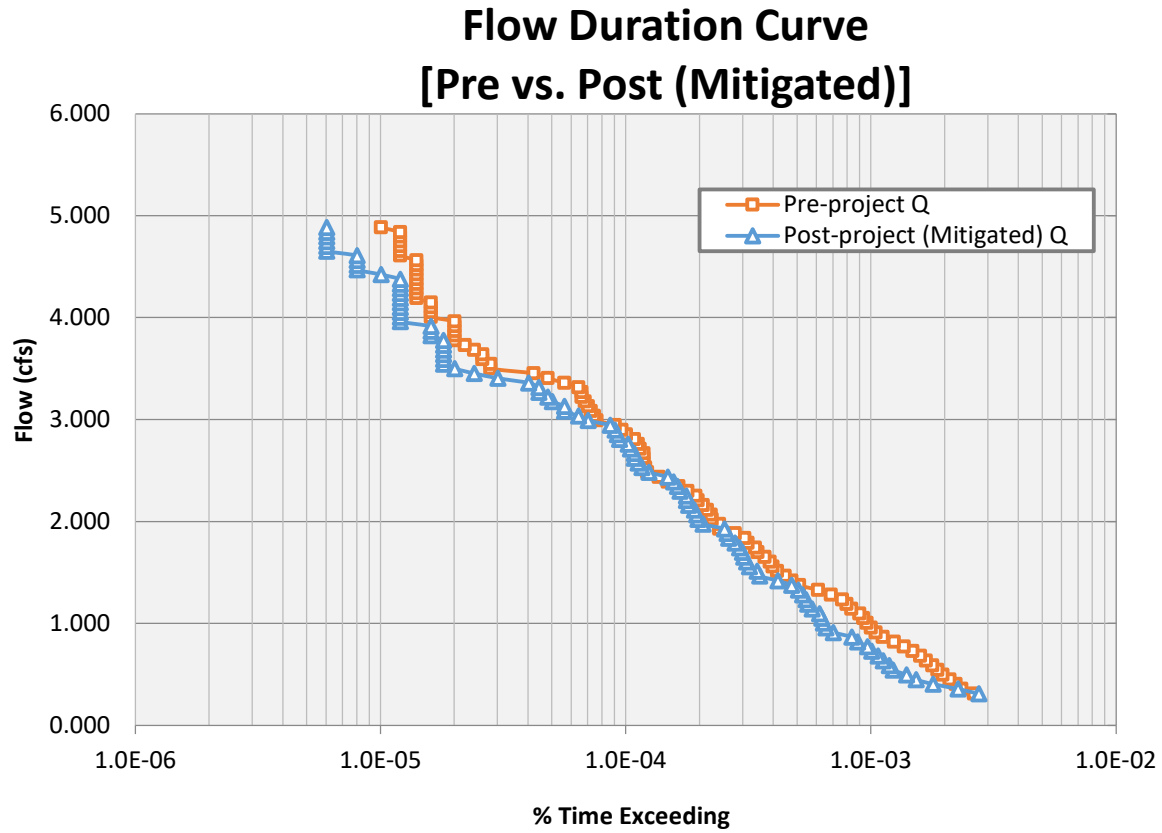
Attachments

1. POC-1, Flow Frequency Curve Summary
 2. POC-1, Flow Duration Curve
 3. POC-1, Flow Duration Curve Summary
 4. SWMM Model Layout
 5. SWMM Input file
 6. SWMM Output File
 7. Node Depth Summary
 8. Link Flow Summary
 9. Node Inflow Summary
 10. Storage Volume Summary
 11. Subcatchment Runoff Summary
 12. Green Ampt Inputs
-

Pre-project Flow Frequency - Long-term Simulation

10-year Q:	4.885	cfs
2-year Q:	3.127	cfs
Lower Flow Threshold:	10%	
0.1xQ2 (Pre):	0.313	cfs

Statistics - Node E-POC-1 Total Inflow					
		Event	Event	Exceedance	Return
		Duration	Peak	Frequency	Period
Rank	Start Date	(hours)	(CFS)	(percent)	(years)
1	1/16/1978	8	7.148	0.24	58
2	1/1/1982	26	7.102	0.47	29
3	10/1/1983	11	5.785	0.71	19.33
4	1/9/1978	32	5.04	0.95	14.5
5	4/4/1967	22	4.976	1.18	11.6
6	1/20/1982	22	4.866	1.42	9.67
7	1/3/1995	32	4.59	1.65	8.29
8	2/9/1963	24	4.178	1.89	7.25
9	2/7/1978	74	3.997	2.13	6.44
10	3/15/1986	24	3.974	2.36	5.8
11	3/5/1995	24	3.769	2.6	5.27
12	2/11/1959	4	3.709	2.84	4.83
13	2/22/2004	3	3.659	3.07	4.46
14	6/10/1990	1	3.578	3.31	4.14
15	2/22/1998	49	3.494	3.55	3.87
16	2/12/1978	18	3.487	3.78	3.63
17	6/1/1996	1	3.479	4.02	3.41
18	2/16/1980	109	3.471	4.26	3.22
19	1/9/1980	80	3.464	4.49	3.05
20	1/9/1998	13	3.416	4.73	2.9
21	1/28/1980	35	3.404	4.96	2.76
22	1/4/1978	23	3.394	5.2	2.64
23	2/11/1973	7	3.375	5.44	2.52
24	3/17/1982	16	3.335	5.67	2.42
25	9/10/1976	16	3.331	5.91	2.32
26	11/24/1983	2	3.312	6.15	2.23
27	1/14/1993	5	3.176	6.38	2.15
28	1/18/1955	4	3.148	6.62	2.07
29	2/12/1992	21	3.127	6.86	2



POC-1, Flow Duration Curve Summary

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	0.313	cfs
Q10 (Pre):	4.885	cfs
Ordinate #:	99	
Incremental Q (Pre):	0.04618	cfs
Total Hourly Data:	498244	hours

The proposed BMP:	PASSED
--------------------------	---------------

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	0.313	1314	2.64E-03	1371	2.75E-03	104%	Pass
1	0.359	1168	2.34E-03	1128	2.26E-03	97%	Pass
2	0.405	1105	2.22E-03	894	1.79E-03	81%	Pass
3	0.451	1046	2.10E-03	762	1.53E-03	73%	Pass
4	0.497	979	1.96E-03	696	1.40E-03	71%	Pass
5	0.544	932	1.87E-03	614	1.23E-03	66%	Pass
6	0.590	887	1.78E-03	592	1.19E-03	67%	Pass
7	0.636	836	1.68E-03	559	1.12E-03	67%	Pass
8	0.682	792	1.59E-03	533	1.07E-03	67%	Pass
9	0.728	737	1.48E-03	501	1.01E-03	68%	Pass
10	0.775	680	1.36E-03	482	9.67E-04	71%	Pass
11	0.821	620	1.24E-03	439	8.81E-04	71%	Pass
12	0.867	557	1.12E-03	416	8.35E-04	75%	Pass
13	0.913	522	1.05E-03	350	7.02E-04	67%	Pass
14	0.959	499	1.00E-03	326	6.54E-04	65%	Pass
15	1.005	479	9.61E-04	319	6.40E-04	67%	Pass
16	1.052	464	9.31E-04	314	6.30E-04	68%	Pass
17	1.098	447	8.97E-04	307	6.16E-04	69%	Pass
18	1.144	415	8.33E-04	287	5.76E-04	69%	Pass
19	1.190	397	7.97E-04	275	5.52E-04	69%	Pass
20	1.236	380	7.63E-04	271	5.44E-04	71%	Pass
21	1.283	343	6.88E-04	262	5.26E-04	76%	Pass
22	1.329	304	6.10E-04	252	5.06E-04	83%	Pass
23	1.375	254	5.10E-04	237	4.76E-04	93%	Pass
24	1.421	237	4.76E-04	208	4.17E-04	88%	Pass
25	1.467	222	4.46E-04	175	3.51E-04	79%	Pass
26	1.513	207	4.15E-04	171	3.43E-04	83%	Pass
27	1.560	198	3.97E-04	159	3.19E-04	80%	Pass
28	1.606	193	3.87E-04	155	3.11E-04	80%	Pass

29	1.652	184	3.69E-04	151	3.03E-04	82%	Pass
30	1.698	172	3.45E-04	149	2.99E-04	87%	Pass
31	1.744	168	3.37E-04	145	2.91E-04	86%	Pass
32	1.791	157	3.15E-04	139	2.79E-04	89%	Pass
33	1.837	152	3.05E-04	131	2.63E-04	86%	Pass
34	1.883	139	2.79E-04	129	2.59E-04	93%	Pass
35	1.929	120	2.41E-04	126	2.53E-04	105%	Pass
36	1.975	120	2.41E-04	103	2.07E-04	86%	Pass
37	2.021	112	2.25E-04	98	1.97E-04	88%	Pass
38	2.068	111	2.23E-04	97	1.95E-04	87%	Pass
39	2.114	107	2.15E-04	95	1.91E-04	89%	Pass
40	2.160	103	2.07E-04	90	1.81E-04	87%	Pass
41	2.206	98	1.97E-04	88	1.77E-04	90%	Pass
42	2.252	96	1.93E-04	88	1.77E-04	92%	Pass
43	2.299	89	1.79E-04	83	1.67E-04	93%	Pass
44	2.345	82	1.65E-04	81	1.63E-04	99%	Pass
45	2.391	74	1.49E-04	78	1.57E-04	105%	Pass
46	2.437	68	1.36E-04	74	1.49E-04	109%	Pass
47	2.483	61	1.22E-04	62	1.24E-04	102%	Pass
48	2.529	60	1.20E-04	58	1.16E-04	97%	Pass
49	2.576	59	1.18E-04	56	1.12E-04	95%	Pass
50	2.622	59	1.18E-04	54	1.08E-04	92%	Pass
51	2.668	59	1.18E-04	54	1.08E-04	92%	Pass
52	2.714	57	1.14E-04	52	1.04E-04	91%	Pass
53	2.760	56	1.12E-04	51	1.02E-04	91%	Pass
54	2.807	54	1.08E-04	47	9.43E-05	87%	Pass
55	2.853	50	1.00E-04	46	9.23E-05	92%	Pass
56	2.899	48	9.63E-05	45	9.03E-05	94%	Pass
57	2.945	45	9.03E-05	43	8.63E-05	96%	Pass
58	2.991	38	7.63E-05	35	7.02E-05	92%	Pass
59	3.037	37	7.43E-05	32	6.42E-05	86%	Pass
60	3.084	36	7.23E-05	28	5.62E-05	78%	Pass
61	3.130	35	7.02E-05	28	5.62E-05	80%	Pass
62	3.176	34	6.82E-05	25	5.02E-05	74%	Pass
63	3.222	33	6.62E-05	24	4.82E-05	73%	Pass
64	3.268	33	6.62E-05	22	4.42E-05	67%	Pass
65	3.315	32	6.42E-05	22	4.42E-05	69%	Pass
66	3.361	28	5.62E-05	20	4.01E-05	71%	Pass
67	3.407	24	4.82E-05	15	3.01E-05	63%	Pass
68	3.453	21	4.21E-05	12	2.41E-05	57%	Pass
69	3.499	14	2.81E-05	10	2.01E-05	71%	Pass
70	3.546	14	2.81E-05	9	1.81E-05	64%	Pass
71	3.592	13	2.61E-05	9	1.81E-05	69%	Pass
72	3.638	13	2.61E-05	9	1.81E-05	69%	Pass
73	3.684	12	2.41E-05	9	1.81E-05	75%	Pass

74	3.730	11	2.21E-05	9	1.81E-05	82%	Pass
75	3.776	10	2.01E-05	9	1.81E-05	90%	Pass
76	3.823	10	2.01E-05	8	1.61E-05	80%	Pass
77	3.869	10	2.01E-05	8	1.61E-05	80%	Pass
78	3.915	10	2.01E-05	8	1.61E-05	80%	Pass
79	3.961	10	2.01E-05	6	1.20E-05	60%	Pass
80	4.007	8	1.61E-05	6	1.20E-05	75%	Pass
81	4.054	8	1.61E-05	6	1.20E-05	75%	Pass
82	4.100	8	1.61E-05	6	1.20E-05	75%	Pass
83	4.146	8	1.61E-05	6	1.20E-05	75%	Pass
84	4.192	7	1.40E-05	6	1.20E-05	86%	Pass
85	4.238	7	1.40E-05	6	1.20E-05	86%	Pass
86	4.284	7	1.40E-05	6	1.20E-05	86%	Pass
87	4.331	7	1.40E-05	6	1.20E-05	86%	Pass
88	4.377	7	1.40E-05	6	1.20E-05	86%	Pass
89	4.423	7	1.40E-05	5	1.00E-05	71%	Pass
90	4.469	7	1.40E-05	4	8.03E-06	57%	Pass
91	4.515	7	1.40E-05	4	8.03E-06	57%	Pass
92	4.562	7	1.40E-05	4	8.03E-06	57%	Pass
93	4.608	6	1.20E-05	4	8.03E-06	67%	Pass
94	4.654	6	1.20E-05	3	6.02E-06	50%	Pass
95	4.700	6	1.20E-05	3	6.02E-06	50%	Pass
96	4.746	6	1.20E-05	3	6.02E-06	50%	Pass
97	4.792	6	1.20E-05	3	6.02E-06	50%	Pass
98	4.839	6	1.20E-05	3	6.02E-06	50%	Pass
99	4.885	5	1.00E-05	3	6.02E-06	60%	Pass

[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option Value
FLOW_UNITS CFS
INFILTRATION GREEN_AMPT
FLOW_ROUTING KINWAVE
LINK_OFFSETS DEPTH
MIN_SLOPE 0
ALLOW_PONDING NO
SKIP_STEADY_STATE NO

START_DATE 07/25/1951
START_TIME 04:00:00
REPORT_START_DATE 07/25/1951
REPORT_START_TIME 04:00:00
END_DATE 05/26/2008
END_TIME 08:00:00
SWEEP_START 01/01
SWEEP_END 12/31
DRY_DAYS 0
REPORT_STEP 01:00:00
WET_STEP 00:15:00
DRY_STEP 04:00:00
ROUTING_STEP 0:01:00
RULE_STEP 00:00:00

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

[EVAPORATION]
;;Data Source Parameters
;;-----
MONTHLY 0.06 0.08 0.11 0.15 0.18 0.21 0.21 0.21 0.16 0.12 0.08 0.06
DRY_ONLY NO

[RAINGAGES]
;;Name Format Interval SCF Source
;;-----

Fallbrook INTENSITY 1:00 1.0 TIMESERIES Fallbrook

[SUBCATCHMENTS]

;;Name	Rain Gage	Outlet	Area	%Imperv	Width	%Slope	CurbLen	SnowPack
;;-----	-----	-----	-----	-----	-----	-----	-----	-----
E-DMA-1	Fallbrook	E-POC-1	5.20	0	2267	10	0	
DMA-2	Fallbrook	BMP-2	2.05	78	893	1.0	0	
DMA-1	Fallbrook	BMP-1	2.73	86	1187	0.5	0	
DMA-5	Fallbrook	POC-1	0.43	0	187	1.0	0	
E-OFF-1	Fallbrook	E-POC-OFF	2.83	0	100	10	0	
P-OFF-1	Fallbrook	P-POC-OFF	2.83	0	100	10	0	

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
;;-----	-----	-----	-----	-----	-----	-----	-----
E-DMA-1	0.012	0.15	0.05	0.10	25	OUTLET	
DMA-2	0.012	0.15	0.05	0.10	25	OUTLET	
DMA-1	0.012	0.15	0.05	0.10	25	OUTLET	
DMA-5	0.012	0.15	0.05	0.10	25	OUTLET	
E-OFF-1	0.012	0.15	0.05	0.10	25	OUTLET	
P-OFF-1	0.012	0.15	0.05	0.10	25	OUTLET	

[INFILTRATION]

;;Subcatchment	Suction	Ksat	IMD
;;-----	-----	-----	-----
E-DMA-1	9.0	0.025	0.30
DMA-2	6.0	0.1	0.31
DMA-1	6.0	0.1	0.31
DMA-5	6.0	0.1	0.31
E-OFF-1	9.0	0.025	0.30
P-OFF-1	9.0	0.025	0.30

[OUTFALLS]

;;Name	Elevation	Type	Stage Data	Gated	Route To
;;-----	-----	-----	-----	-----	-----
E-POC-1	0	FREE		NO	
POC-1	0	FREE		NO	
E-POC-OFF	0	FREE		NO	
P-POC-OFF	0	FREE		NO	

[STORAGE]

;;Name	Elev.	MaxDepth	InitDepth	Shape	Curve Name/Params	N/A	Fevap	Psi	Ksat	IMD
;;-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BMP-1	0	5.50	0	TABULAR	BMP-1	0	0			
BMP-2	0	5.50	0	TABULAR	BMP-2	0	0			

[ORIFICES]

;;Name	From Node	To Node	Type	Offset	Qcoeff	Gated	CloseTime
;;-----	-----	-----	-----	-----	-----	-----	-----
LOWFLOW_1	BMP-1	POC-1	SIDE	0	0.65	NO	0

LOWFLOW_2 BMP-2 POC-1 SIDE 0 0.65 NO 0

[OUTLETS]

;;Name	From Node	To Node	Offset	Type	QTable/Qcoeff	Qexpon	Gated
;;							
RISER_1	BMP-1	POC-1	3.5	TAPULAR/HEAD	12_NYLO		NO
RISER_2	BMP-2	POC-1	3.50				NO

[XSECTIONS]

;;Link	Shape	Geom1	Geom2	Geom3	Geom4	Barrels	Culvert
;;							
LOWFLOW_1	CIRCULAR	.17	0	0	0		
LOWFLOW_2	CIRCULAR	0.08	0	0	0		

[CURVES]

;;Name	Type	X-Value	Y-Value
;;			
12_NYLO	Rating	0	0
12_NYLO		0.05	0.05
12_NYLO		0.10	0.30
12_NYLO		0.15	0.55
12_NYLO		0.20	0.85
12_NYLO		0.25	1.15
12_NYLO		0.30	1.27
12_NYLO		0.35	1.35
12_NYLO		0.40	1.47
12_NYLO		0.45	1.57
12_NYLO		0.50	1.65
12_NYLO		0.55	1.72
12_NYLO		0.60	1.80
12_NYLO		0.65	1.85
12_NYLO		0.70	1.95
12_NYLO		0.75	2.02
12_NYLO		0.80	2.07
12_NYLO		0.85	2.12
12_NYLO		0.90	2.22
12_NYLO		0.95	2.27
12_NYLO		1.0	2.32
12_NYLO		1.05	2.37
12_NYLO		1.10	2.45
12_NYLO		1.15	2.50
12_NYLO		1.20	2.54
12_NYLO		1.25	2.58
12_NYLO		1.30	2.62
12_NYLO		1.35	2.68
12_NYLO		1.40	2.72
12_NYLO		1.45	2.76
12_NYLO		1.50	2.80
12_NYLO		1.55	2.84
12_NYLO		1.60	2.88

LOWFLOW_1 - BMP-1: 2" (0.17 ft) Orifice

LOWFLOW_2 - BMP-2: 1" (0.08 ft) Orifice

12_NYLO		1.65	2.92
12_NYLO		1.70	2.96
12_NYLO		1.75	3
12_NYLO		1.80	3.02
12_NYLO		1.85	3.04
12_NYLO		1.90	3.06
12_NYLO		1.95	3.08
12_NYLO		2	3.10
;			
BMP-1	Storage	0	980
BMP-1		1.0	980
BMP-1		1.0001	490
BMP-1		2.75	490
BMP-1		2.750001	2450
BMP-1		3.50	2850
BMP-1		4.50	3700
BMP-1		5.50	4605
;			
BMP-2	Storage	0	776
BMP-2		1.0	776
BMP-2		1.00001	388
BMP-2		2.75	388
BMP-2		2.750001	1940
BMP-2		3.50	2405
BMP-2		4.50	3370
BMP-2		5.50	4390

[TIMESERIES]			
;;Name	Date	Time	Value
;;-----			
Fallbrook	7/25/1951	4:00:00	0.33
Fallbrook	8/28/1951	4:00:00	0.03
Fallbrook	8/28/1951	7:00:00	0.1
Fallbrook	8/28/1951	8:00:00	0.11
Fallbrook	8/28/1951	9:00:00	0.26
Fallbrook	8/28/1951	10:00:00	0.2
Fallbrook	8/28/1951	11:00:00	0.2
Fallbrook	8/28/1951	12:00:00	0.03
Fallbrook	8/28/1951	13:00:00	0.06
Fallbrook	8/28/1951	14:00:00	0.01
Fallbrook	8/29/1951	2:00:00	0.03
Fallbrook	8/29/1951	3:00:00	0.01
Fallbrook	8/29/1951	5:00:00	0.01
Fallbrook	8/29/1951	7:00:00	0.06
Fallbrook	8/29/1951	8:00:00	0.01
Fallbrook	9/27/1951	24:00:00	0.03
Fallbrook	9/28/1951	4:00:00	0.01
Fallbrook	9/28/1951	5:00:00	0.02
Fallbrook	10/2/1951	24:00:00	0.04
Fallbrook	10/3/1951	1:00:00	0.01

Printout of the time series is cut off here as the full set is several hundred pages long. The full set was used in the analysis and can be found at projectcleanwater.org

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
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
Infiltration Method GREEN_AMPT
Flow Routing Method KINWAVE
Starting Date 07/25/1951 04:00:00
Ending Date 05/26/2008 08:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 04:00:00
Routing Time Step 60.00 sec

*****	Volume	Depth
Runoff Quantity Continuity	acre-feet	inches
*****	-----	-----
Total Precipitation	1166.950	871.400
Evaporation Loss	56.085	41.881
Infiltration Loss	690.073	515.301
Surface Runoff	432.396	322.884
Final Storage	0.000	0.000
Continuity Error (%)	-0.994	

*****	Volume	Volume
Flow Routing Continuity	acre-feet	10^6 gal
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	432.396	140.903

Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	432.268	140.861
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.029	

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
Percent Not Converging : 0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Imperv Runoff in	Perv Runoff in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
E-DMA-1	871.40	0.00	27.97	606.05	0.00	248.68	248.68	35.11	7.12	0.285
DMA-2	871.40	0.00	84.80	167.20	606.76	23.98	630.74	35.11	2.84	0.724
DMA-1	871.40	0.00	94.27	106.32	666.40	15.37	681.76	50.54	3.81	0.782
DMA-5	871.40	0.00	6.93	768.40	0.00	98.19	98.19	1.15	0.56	0.113
E-OFF-1	871.40	0.00	2.59	833.78	0.00	35.49	35.49	2.73	3.48	0.041
P-OFF-1	871.40	0.00	30.41	638.29	0.00	211.57	211.57	16.26	3.70	0.243

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence		Reported Max Depth Feet
					days	hr:min	
E-POC-1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
POC-1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
E-POC-OFF	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
P-POC-OFF	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
BMP-1	STORAGE	0.04	5.00	5.00	9672	17:05	4.97
BMP-2	STORAGE	0.10	4.58	4.58	9672	17:04	4.57

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence		Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
				days	hr:min			
E-POC-1	OUTFALL	7.12	7.12	9672	17:01	35.1	35.1	0.000
POC-1	OUTFALL	0.56	6.07	9672	17:01	1.15	86.8	0.000
E-POC-OFF	OUTFALL	3.48	3.48	9672	17:01	2.73	2.73	0.000
P-POC-OFF	OUTFALL	3.70	3.70	9672	17:01	16.3	16.3	0.000
BMP-1	STORAGE	3.81	3.81	11118	05:01	50.5	50.5	0.056
BMP-2	STORAGE	2.84	2.84	11118	04:46	35.1	35.1	0.037

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence		Maximum Outflow CFS
							days	hr:min	
BMP-1	0.033	0	0	0	9.058	81	9672	17:04	3.06
BMP-2	0.071	1	0	0	6.264	64	9672	17:03	2.48

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
E-POC-1	0.49	0.53	7.12	35.112
POC-1	8.19	0.08	6.07	86.753
E-POC-OFF	0.08	0.24	3.48	2.727
P-POC-OFF	0.69	0.18	3.70	16.258
System	2.37	1.03	3.70	140.851

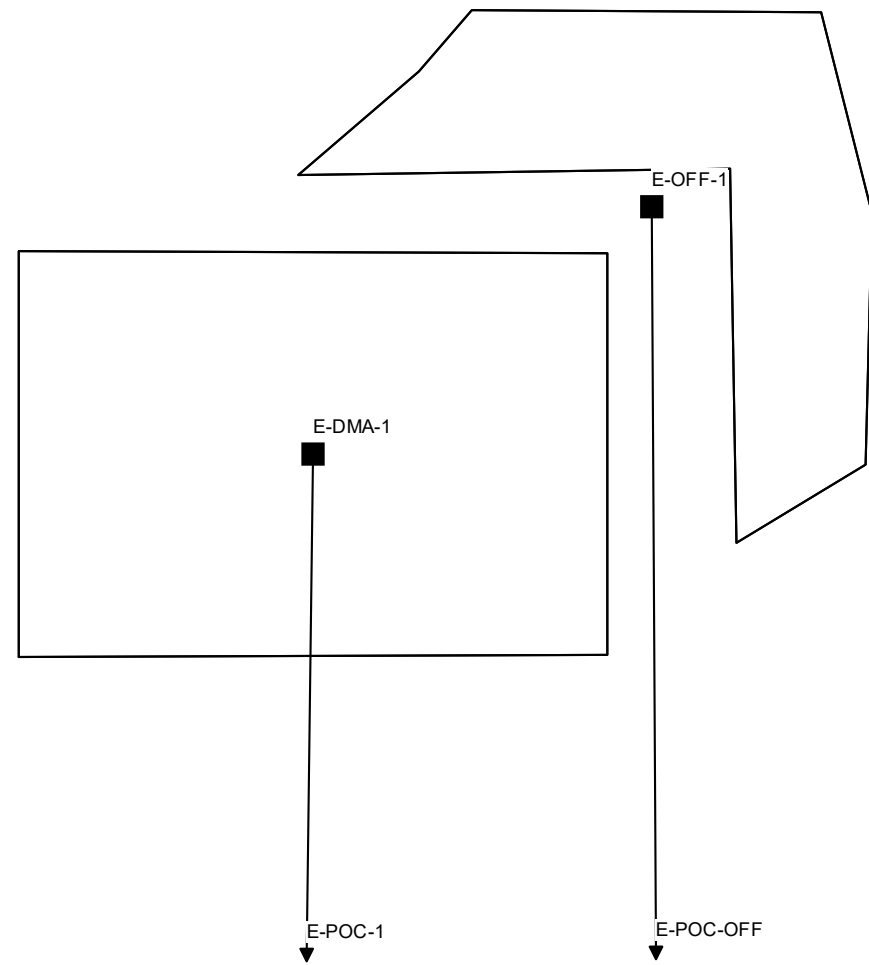
Link Flow Summary

Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min		Maximum Veloc ft/sec	Max/ Full Flow	Max/ Full Depth
LOWFLOW_1	ORIFICE	0.26	9672	17:05			0.00
LOWFLOW_2	ORIFICE	0.06	9672	17:04			0.00
RISER_1	DUMMY	2.80	9672	17:05			
RISER_2	DUMMY	2.42	9672	17:04			

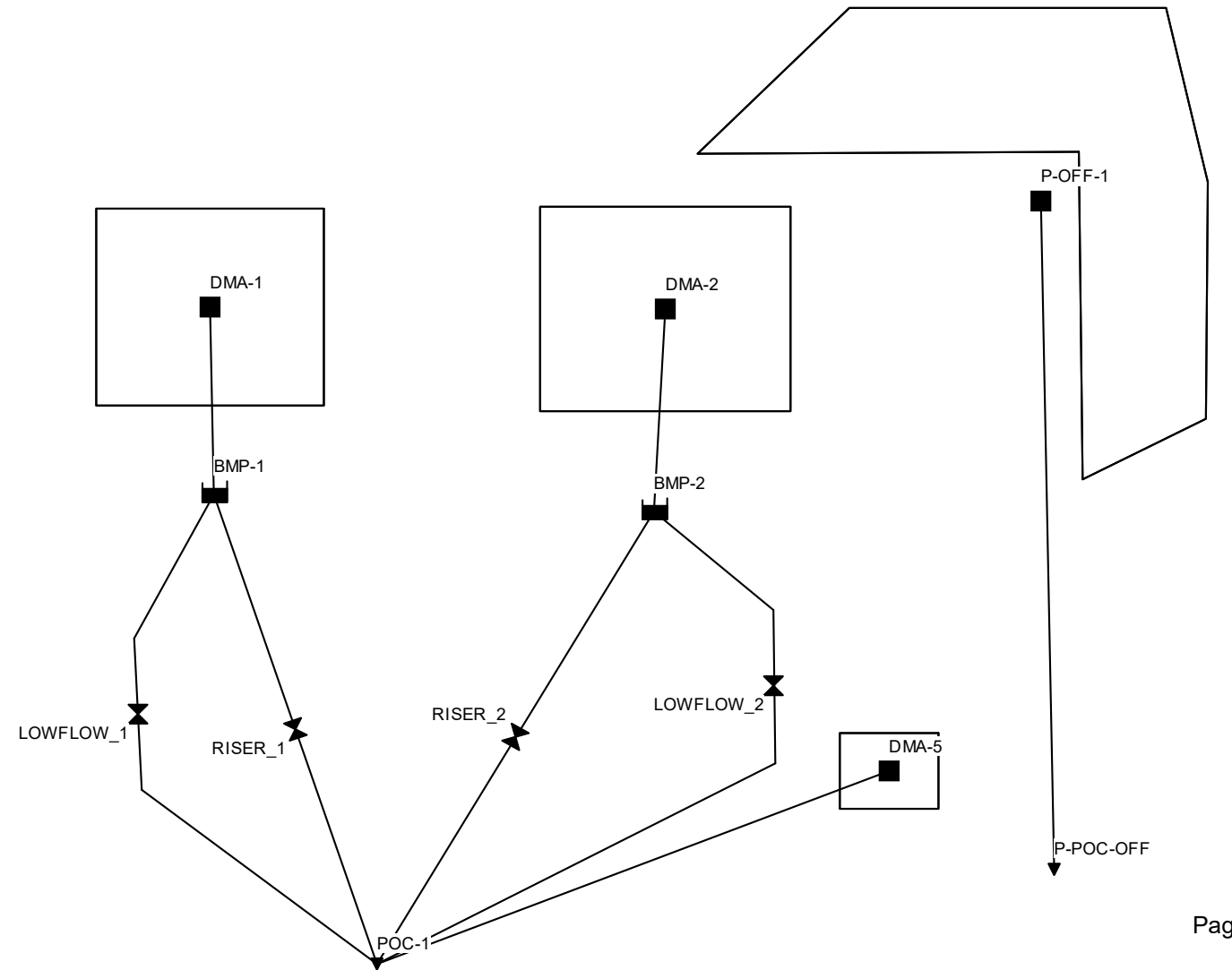
Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Tue Jun 16 13:44:53 2026
Analysis ended on: Tue Jun 16 13:45:41 2026
Total elapsed time: 00:00:48



Fallbrook



Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Day of Maximum Depth	Hour of Maximum Depth	Maximum Reported Depth Feet
E-POC-1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
POC-1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
E-POC-OFF	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
P-POC-OFF	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
BMP-1	STORAGE	0.04	5.00	5.00	9672	17:05	4.97
BMP-2	STORAGE	0.10	4.58	4.58	9672	17:04	4.57

Link Flow Summary

Link	Type	Maximum Flow CFS	Day of Maximum Flow	Hour of Maximum Flow	Maximum Velocity ft/sec	Max / Full Flow	Max / Full Depth
LOWFLOW_1	ORIFICE	0.26	9672	17:05	0.00		
LOWFLOW_2	ORIFICE	0.06	9672	17:04	0.00		
RISER_1	DUMMY	2.80	9672	17:05			
RISER_2	DUMMY	2.42	9672	17:04			

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Day of Maximum Inflow	Hour of Maximum Inflow	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
E-POC-1	OUTFALL	7.12	7.12	9672	17:01	35.1	35.1	0.000
POC-1	OUTFALL	0.56	6.07	9672	17:01	1.15	86.8	0.000
E-POC-OFF	OUTFALL	3.70	3.70	9672	17:01	16.3	16.3	0.000
P-POC-OFF	OUTFALL	3.70	3.70	9672	17:01	16.3	16.3	0.000
BMP-1	STORAGE	3.81	3.81	11118	05:01	50.5	50.5	0.056
BMP-2	STORAGE	2.84	2.84	11118	04:46	35.1	35.1	0.037

Storage Volume Summary

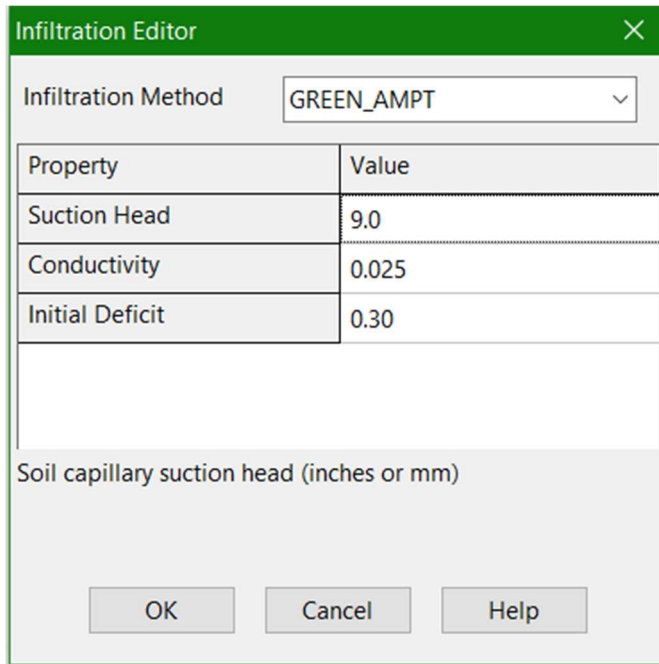
Storage Unit	Average Volume 1000 ft3	Average Percent Full	Evap Percent Loss	Exfil Percent Loss	Maximum Volume 1000 ft3	Maximum Percent Full	Day of Maximum Volume	Hour of Maximum Volume	Maximum Outflow CFS
BMP-1	0.033	0	0	0	9.058	81	9672	17:04	3.06
BMP-2	0.071	1	0	0	6.264	64	9672	17:03	2.48

Subcatchment Runoff Summary

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Imperv Runoff in	Perv Runoff in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
E-DMA-1	871.40	0.00	27.97	606.05	0.00	248.68	248.68	35.11	7.12	0.285
DMA-2	871.40	0.00	84.80	167.20	606.76	23.98	630.74	35.11	2.84	0.724
DMA-1	871.40	0.00	94.27	106.32	666.40	15.37	681.76	50.54	3.81	0.782
DMA-5	871.40	0.00	6.93	768.40	0.00	98.19	98.19	1.15	0.56	0.113
E-OFF-1	871.40	0.00	30.41	638.29	0.00	211.57	211.57	16.26	3.70	0.243
P-OFF-1	871.40	0.00	30.41	638.29	0.00	211.57	211.57	16.26	3.70	0.243

Green-Ampt Input Values

E-DMA-1, E-OFF-1 & P-OFF-1:



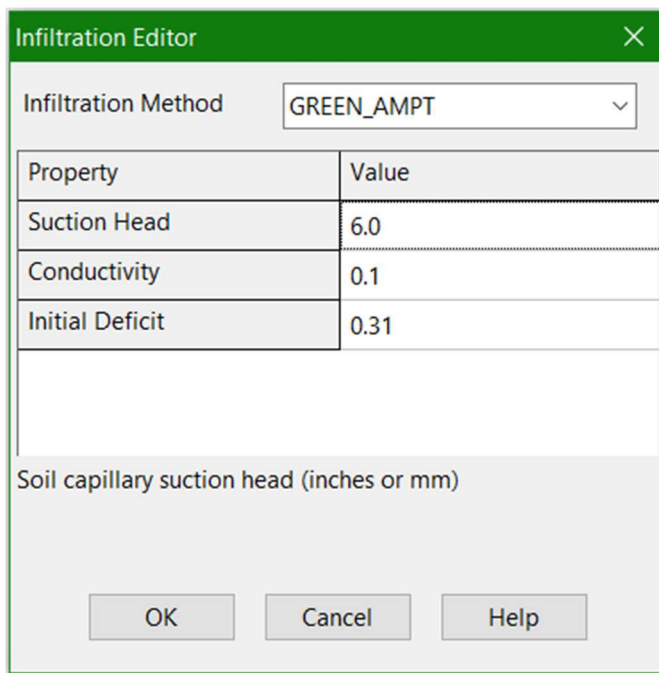
The Infiltration Editor dialog box for E-DMA-1, E-OFF-1 & P-OFF-1 shows the following configuration:

- Infiltration Method:** GREEN_AMPT
- Property Value Table:**

Property	Value
Suction Head	9.0
Conductivity	0.025
Initial Deficit	0.30

Below the table is a text input field for "Soil capillary suction head (inches or mm)". At the bottom are buttons for OK, Cancel, and Help.

DMA-1, DMA-2 & DMA-5:



The Infiltration Editor dialog box for DMA-1, DMA-2 & DMA-5 shows the following configuration:

- Infiltration Method:** GREEN_AMPT
- Property Value Table:**

Property	Value
Suction Head	6.0
Conductivity	0.1
Initial Deficit	0.31

Below the table is a text input field for "Soil capillary suction head (inches or mm)". At the bottom are buttons for OK, Cancel, and Help.

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
POC-1	Public stormdrain system that drains west to O'Neill Lake, as a part of the Santa Margarita River	Existing stormdrains northwest of the project site.



County of San Diego Stormwater Quality Management Plan (SWQMP)
Attachment 9: Management of Critical Coarse Sediment Yield Areas

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 Exemption¹	Section 1.6
☒ 9.2: Watershed Management Area Analysis (WMAA) Mapping¹	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 PCCSYAs 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 areas⁴, and (5) bypass of upstream offsite PCCSYAs.

Please see the attached exhibit showing the closest CCSYAs; the closest CCSYA is approximately 1,000 feet southeast of the project site and it does not drain to the project site.

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.

CCSYA Map

No CCSYA areas drain to the site.
No CCSYA areas exist on the site.

Legend

-  1305 E Mission Rd
-  CCSYA Area

Project Site Location

1305 E Mission Rd

Google Earth

Image © 2024 Airbus



1000 ft



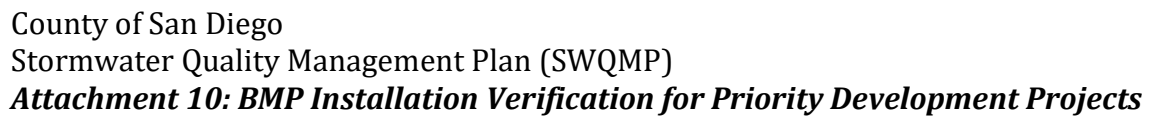
County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 10: BMP Installation Verification for Priority Development Projects

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.

PART 1 PROJECT INFORMATION

A. Project Summary Information	
Project Name	Fallbrook Self Storage
Record ID (e.g. grading/improvement plan number, building permit)	PDS2025-LDGRMJ-30561
Project Address	1305 East Mission Road, Fallbrook, CA 92028
Assessor's Parcel Number(s) APN(s)	105-410-18-00
Project Watershed (Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Hydrologic Unit: Santa Margarita Hydrologic Area: Ysidora Hydrologic Sub-Area: Upper Ysidora #902.13
B. Owner Information	
Name	Kirk Moeller, KM Architects, Inc.
Address	2888 Loker Avenue East, Suite 317, Carlsbad, California 92010
Email Address	kirk@kmarchitectsinc.com
Phone Number	(760) 814-8128

COUNTY – OFFICIAL USE ONLY	
INTAKE ID#	
ACCEPTANCE ID#	



If final grade release or granting of occupancy is being requested for only a portion of the Priority Development Project (PDP) please fill out the table below. Include ALL of the Structural BMPs and/or Significant Site Design BMPs for the entire project in the table. **Include a mark-up of the DMA map from the approved SWQMP with this Verification package that clearly shows which DMAs you are submitting for approval and which DMAs have already been accepted (if any).**

County of San Diego SWQMP Attachment 10
Template Date: August 4, 2021



County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 10: BMP Installation Verification for Priority Development Projects

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County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 10: BMP Installation Verification for Priority Development Projects

PART 2 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.
- 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.

DMA #	BMP Information			Maintenance Category (1, 2, 3, or 4)	Maintenance Agreement Recorded DOC #	Construction Plan Sheet #	Landscape Plan Sheet # TBD	FOR DPW-WPP USE ONLY
	Quantity	Description/Type of Structural BMP	BMP ID #					
A. Structural BMPs (S-BMPs)								
DMA-1	1	Lined biofiltration basin - Pollutant Control and Hydromodification	BMP-1	2	TBD	DMA Plan	TBD	
DMA-2	1	Lined biofiltration basin - Pollutant Control and Hydromodification	BMP-2	2	TBD	DMA Plan	TBD	
Add rows as needed. Click into the last column in the row below this, then press TAB to add a new row.								
B. Significant Site Design BMPs (SSD-BMPs)								
DMA-3	8	Tree Well	Tree-Well-1	2	TBD	DMA Plan		
		Choose an item.		Choose				
		Choose an item.		Choose				
		Choose an item.		Choose				
		Choose an item.		Choose				



County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 10: BMP Installation Verification for Priority Development Projects

		Choose an item.		Choose				
Add rows as needed. Click into the last column in the row below this, then press TAB to add a new row.								



PART 3 REQUIRED ATTACHMENTS

For the permanent BMPs listed in Part 2, submit the following to the County inspector along with this Verification form as a package (check all that are attached):

- ☐ **PHOTOGRAPHS:** Final construction photos of every permanent BMP listed in Part 2 are required. Final photos must be recent and be labeled with the date and a BMP Identifier. Additional photographs illustrating proper construction of the BMPs are recommended to be included and may be requested by WPP prior to acceptance of this Verification (e.g. excavation depths, liners, hydromodification orifices, Biofiltration Soil Media (BSM), vegetation, mulch).

- ☐ **MAINTENANCE AGREEMENTS:** Copies of approved and recorded Storm Water Maintenance Agreements (SWMA), Category 1 Maintenance Notification Agreements (MN), or Encroachment Maintenance and Removal Agreements (EMRA) for all S-BMPs.

Note: Significant Site Design (SSD) BMPs and most Category 4 BMPs do not require recorded maintenance agreements.

- ☐ **CONSTRUCTION PLANS:** Submit electronic and/or 11" X 17" hard copies of the current approved Construction Plan sheets for the Record ID(s) listed on Page 1:

- ☐ Grading Plans
- ☐ Improvement Plans
- ☐ Precise Grading Plan
- ☐ Building Plan (Applicable BMP Sheets only)
- ☐ Other (Please specify) _____

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

- A BMP Table on Sheet 1, AND
- A plan detail cross-section of each verified as-built BMP, AND
- The location of each verified as-built BMP

- ☐ **LANDSCAPE PLANS:** If the PDP includes vegetated BMPs and has a Landscape Plan, submit the following:

- ☐ Final Landscape Plans
- ☐ Proof of Irrigation Installed (if applicable)



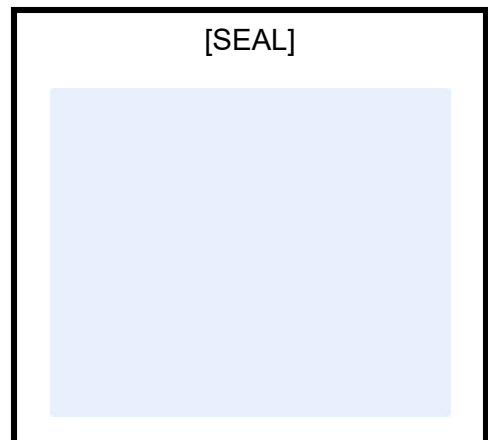
PART 4 PREPARER'S CERTIFICATION

By signing below, I certify that the BMP(s) listed in Part 2 of this Verification Form have been constructed and 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 must be certified by a licensed professional engineer.

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

Preparer's Name:	Patric T. de Boer
Email Address:	patric@omega-consultants.com
Phone Number:	(858) 634-8620
Preparer's Signature:	
Date:	





County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 10: BMP Installation Verification for Priority Development Projects

PROJECT RECORD ID: PDS2025-LDGRM-30561

COUNTY - OFFICIAL USE ONLY

County Inspector Approval:

***NOTE: The County approved SWQMP document and any Addendums or Revisions must be included with this BMP Installation Verification submittal package.**

- ☐ DPW Private Development Construction Inspection (PDCI)
- ☐ PDS Building
- ☐ DGS
- ☐ DPR

By signing below, the County Inspector concurs that every BMP listed in Part 2 of this BMP Installation Verification form has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

DPW Watershed Protection Program (WPP) Acceptance:

Date Received: _____

WPP Reviewer: _____

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

WPP Reviewer's Signature: _____ Date: _____

Enter Acceptance ID# on page 1.

NOTES:



County of San Diego Stormwater Quality Management Plan (SWQMP)

Attachment 11: BMP Maintenance Agreements and Plans

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 Agreement for Category 1 Stormwater Structural BMPs**

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

CATEGORY 1 MAINTENANCE AGREEMENTS ARE RECORDED PRIOR TO OCCUPANCY.

☒ **Storm Water Facilities Maintenance Agreement (SWMA) (Category 2 BMPs)**

- Exhibit A: Legal Description of Property
- Exhibit B: BMP Maintenance Program (see below)
- Exhibit C: BMP Locations

CATEGORY 2 MAINTENANCE AGREEMENTS ARE RECORDED PRIOR TO PERMIT ISSUANCE.

Maintenance agreement templates and instructions are available on the County's website: www.sandiegocounty.gov/stormwater under the Development Resources tab, Submittal Templates.

b. Maintenance Plan Requirements

Maintenance plans should include the following:

- ☒ Specific **maintenance indicators and actions** for proposed structural BMP(s). These must be based on maintenance indicators presented in BMP Design Manual 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:

(property owner)

SPACE ABOVE THIS LINE FOR RECORDER'S USE

MAINTENANCE NOTIFICATION AGREEMENT FOR CATEGORY 1 STORMWATER STRUCTURAL BMPs

☐ This Maintenance Notification Agreement rescinds and replaces Doc# _____

THIS AGREEMENT is made on the _____ day of _____, 20____.

Boulder Ridge Capital, the Owner(s) of the hereinafter described real property:

Address 1305 East Mission Road, Fallbrook, CA Post Office Box - Zip Code 92028.

Assessor Parcel No.(s) 105-410-18-00

List each Structural Best Management Practice (BMP) for the property as follows: BMP ID, Type, Permit #, Sheet #.

BMP-1 - A FULLY-LINED BIOFILTRATION BASIN, PERMIT #, SHEET #; BMP-2 - A FULLY-LINED

BIOFILTRATION BASIN, PDS2025-LDGRMJ-30561

Attach BMP sheets and details as Exhibit A.

Owner(s) of the above property acknowledge the existence of the stormwater Structural BMP(s) on the said property. Perpetual maintenance of the Structural BMP(s) is the requirement of the State NPDES Permit, Order No. R9-2013-0001 and subsequent amendments, Section E.3.e. and the County of San Diego Watershed Protection Ordinance (WPO) Ordinance No. 10410 Section 67.812 through Section 67.814, and County BMP Design Manual 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:

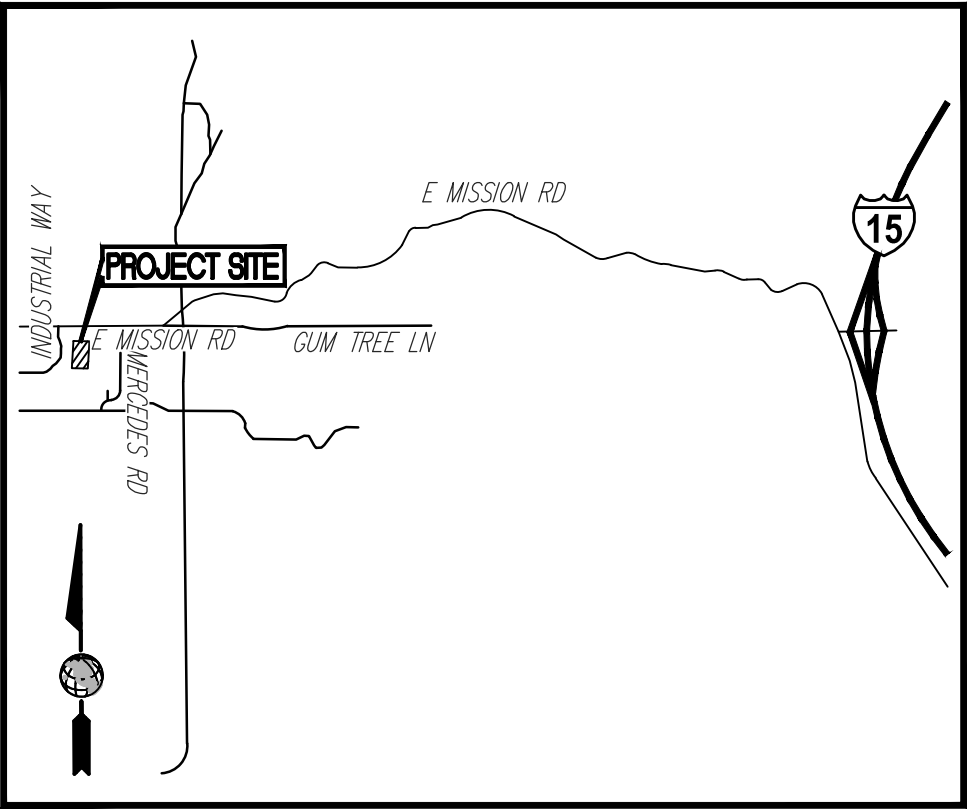
1. I/We are the owner(s) of the existing (or to be constructed concurrently) premises located on the above described property.
2. I/We shall take the responsibility for the perpetual maintenance of the Structural BMP(s) as listed above in accordance with the maintenance plan(s) attached in *Exhibit B* 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 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 Signature(s)

Print Owner Name(s) and Title

EXHIBIT A-1

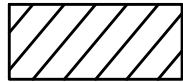


VICINITY MAP

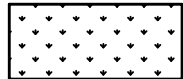
NOT TO SCALE

BMP LOCATION MAP EXHIBIT A-2

LEGEND



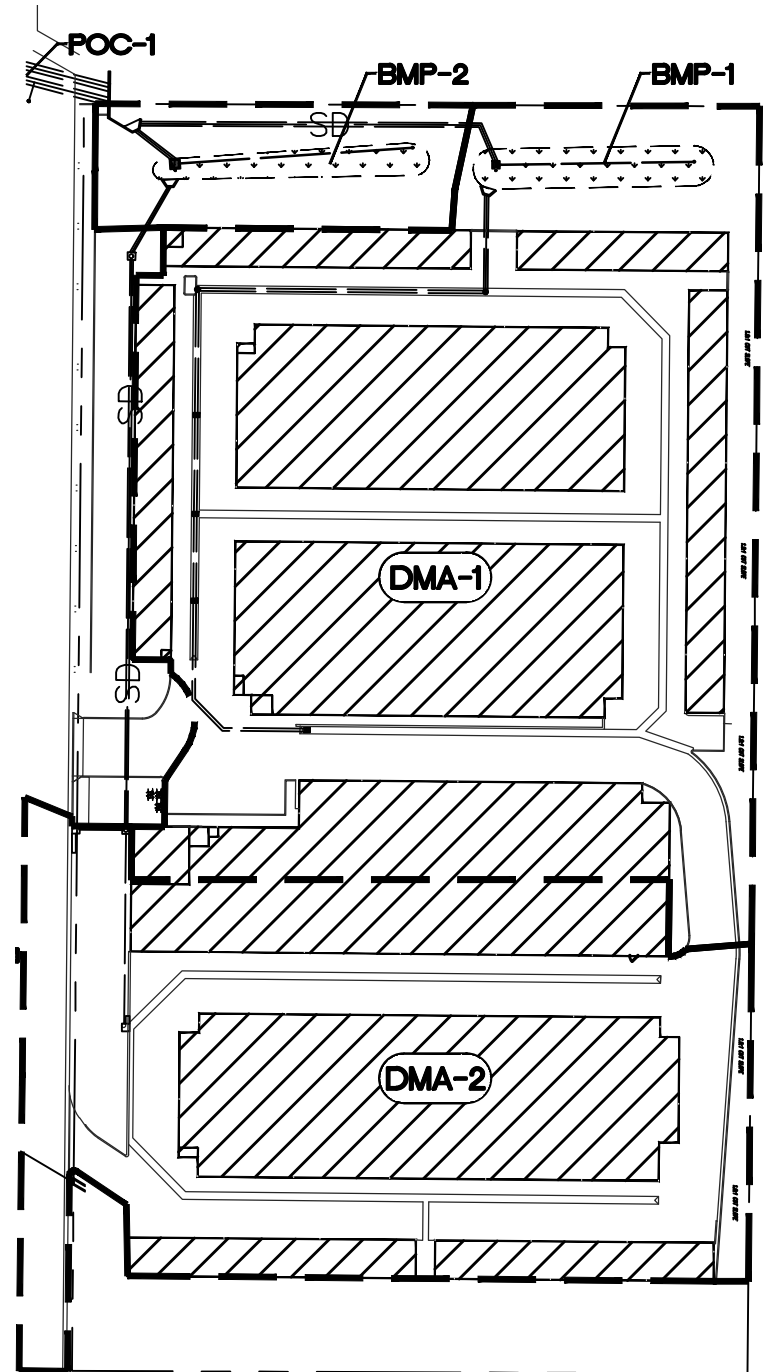
PROPOSED BUILDING



BMP FOOTPRINT

BMP DATA TABLE

BMP-#	TRIBUTARY AREA	DCV (CF)	PROPOSED FOOTPRINT	DESCRIPTION
BMP-1	DMA-1	4,377	2,450	LINED BIOFILTRATION BASIN
BMP-2	DMA-2	3,000	1,940	LINED BIOFILTRATION BASIN

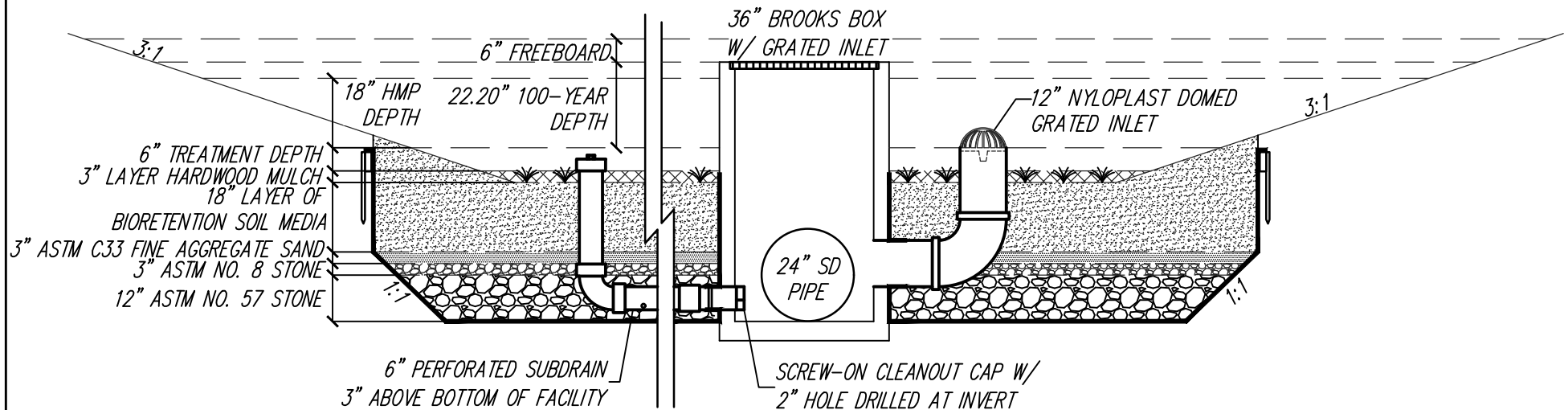


4320 VIEWRIDGE AVE. SUITE C
SAN DIEGO, CA 92123
PH: (858) 634-8620 FAX: (858)-634-8627



GRAPHICAL
SCALE: 1" = 100'
0 50 100

BMP-1 CROSS SECTION DETAIL EXHIBIT A-3

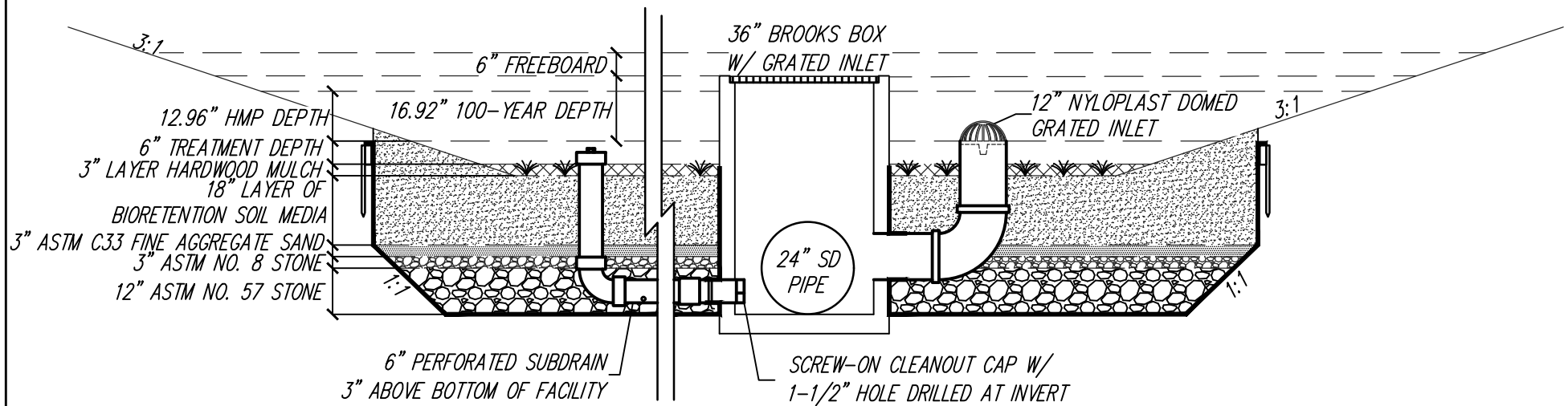


BMP-1, BIOFILTRATION BASIN CROSS-SECTION DETAIL

NOT TO SCALE

BMP-1 CROSS SECTION DETAIL

EXHIBIT A-4



BMP-2, BIOFILTRATION BASIN CROSS-SECTION DETAIL

NOT TO SCALE

Summary of Standard Inspection and Maintenance

The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.

Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation or compaction of the media layer.	• Inspect monthly. If the BMP is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Obstructed inlet or outlet structure	Clear blockage.	• Inspect monthly and after every 0.5-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable	• Inspect annually. • Maintain when needed.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
Overgrown vegetation	Mow or trim as appropriate.	• Inspect monthly. • Maintain when needed.
2/3 of mulch has decomposed, or mulch has been removed	Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches.	• Inspect monthly. • Replenish mulch annually, or more frequently when needed based on inspection.
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	• Inspect monthly. • Maintain when needed.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.	• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.
Standing water in BMP for longer than 24 hours following a storm event Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils.	• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology	If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the County reviewer shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.	• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.
Underdrain clogged	Clear blockage.	Inspect if standing water is observed for longer than 24-96 hours following a storm event. Maintain when needed.

“25% full” is defined as $\frac{1}{4}$ of the depth from the design bottom elevation to the crest of the outflow structure (e.g., if the height to the outflow opening is 12 inches from the bottom elevation, then the materials must be removed when there is 3 inches of accumulation – this should be marked on the outflow structure).



County of San Diego Stormwater Quality Management Plan (SWQMP) Attachment 13: Green Streets PDP Exempt Form

This form must accompany applications for projects proposing Green Street Surfaces and elect to meet the Green Street Performance Standard. Refer to Section 1.4.3 and Appendix K of the County BMP Design Manual for additional guidance.

Project Description

Describe project intent, existing/proposed drainage patterns, net increase in impervious area, and green street performance strategies.

If the project consists entirely of "routine maintenance" activities as outlined in Table 1-2 of the County BMP Design Manual (i.e. road resurfacing, utility trenching, etc), clearly state so and provide a thorough description of these activities. Routine maintenance projects are not required to complete the rest of this SWQMP form.

The project proposes to construct new pavement and resurface portions of the private road along the westerly property line of the project. The improvements being made along the northerly portion of the road cannot physically drain to the proposed biofiltration basins or the onsite tree wells. For this reason, we have explored the option of adding a Green Street BMP to treat the portion of the net increase in impervious area (per County of San Diego BMPDM, Chapter 1.4.3 and Appendix K.2.1). The project qualifies for the PDP exemption as it is retrofitting an existing paved road. The resurfacing portions of the road will not be accounted for in these calculations.

The proposed new pavement along the northerly portion of the road will have a net increase in impervious area of 3,318 sf. The proposed tree well to treat these improvements has been sized using the County's Automated Pollutant Control Worksheet. The calculations indicate that a 20' diameter tree well suffices.

Please refer to the updated website for updated BMPDM manual excerpts:

https://www.sandiegocounty.gov/content/sdc/dpw/watersheds/DevelopmentandConstruction/Green_Streets_PDP_Exemption.html

https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sandiegocounty.gov%2Fcontent%2Fdam%2Fsdcm%2Fdpw%2FWATERSHED_PROTECTION_PROGRAM%2Fwatershedpdf%2FDev_Sup%2FPDP_SWQMP_Att13.docx&wdOrigin=BROWSELINK



County of San Diego Stormwater Quality Management Plan (SWQMP) **Attachment 13: Green Streets PDP Exempt Form**

Stormwater Pollutant Control Calculations

Include calculations showing that the Green Streets Performance Standard has been met. The performance standard can be found in Section K.2.1 of Appendix K of the County BMP Design Manual. The County's Automated Pollutant Control Worksheet can be found on the Development Resources website:

<https://www.sandiegocounty.gov/content/sdc/dpw/watersheds/DevelopmentandConstruction.html>

See Attached calculations for DMA-4.

County of San Diego Automated Worksheets for Significant Site Design BMPs (SSD-BMPs)
SD-A Tree Wells and SD-B Impervious Area Dispersion (Dispersion Areas)
(Version 1.0)

WELCOME:

Welcome to the County of San Diego Automated Worksheets for Significant Site Design BMPs. These worksheets may be used to demonstrate compliance with stormwater pollutant control standards and hydromodification flow control standards set forth in the 2013 MS4 Permit for Priority Development Projects (PDPs).

This workbook is intended for use to demonstrate compliance when significant site design BMPs (SSD-BMPs) are proposed. SSD-BMPs are passive treatment systems that include SD-A Tree Wells and SD-B Dispersion Areas. This worksheet does not support the use of underdrains in SD-A or SD-B. If underdrains are proposed, then continuous simulation modeling should be performed.

When structural BMPs (INF-1, INF-2, INF-3, PR-1, BF-1, BF-2) are proposed, a different workbook, "County of San Diego Automated Stormwater Pollutant Control Worksheets" must be used.

INSTRUCTIONS:

General: To use this workbook, navigate to each of the worksheet tabs below and populate all light green cells with project specific information. Light green cells require user input, white cells are locked for editing and are automatically calculated, bright green cells are also locked for editing and are automatically populated based on results from previous worksheet tabs, grey cells are items that do not require user input because of previous user inputs, orange cells represent warnings where supplemental information and/or revisions may be required for compliance. The worksheets are formatted to accommodate calculations for up to 10 drainage areas and associated BMPs. Each drainage area and BMP is represented as a discrete column with corresponding user inputs and calculations appearing in the rows below. Please note that projects with more than 10 drainage areas may need to use more than one workbook to accommodate the entire project.

Step 1. DCV: Provide the required inputs to determine the design capture volume (DCV) for each PDP drainage management area (DMA). The calculations in this worksheet determine the initial design capture volume and also apply any applicable reductions associated with dispersion to pervious surfaces and incorporation of rain barrels. For DMAs intended to satisfy pollutant control and hydromodification control (when applicable) requirements using Dispersion Areas alone (i.e., not in combination with Tree Wells), the data entered in this tab must provide sufficient pervious area to reduce the remaining DCV in Line 37 to zero. Note that the use of semi-pervious surfaces as dispersion area will not reduce DCV to zero, but the use of engineered pervious surfaces and/or natural pervious surfaces can. For DMAs intended to incorporate Tree Wells, the remaining DCV in Line 37 is the amount to be managed by Tree Wells.

Step 2. Dispersion Areas: [Projects that do not use Dispersion Areas skip this step and go on to Step 3.] When the project includes Dispersion Areas per SD-B, provide required inputs to demonstrate that the requirements for Dispersion Areas are satisfied. If the DMA will also use SD-A Tree Wells downstream of the Dispersion Area to satisfy pollutant control and hydromodification control (when applicable), continue to Step 3. Tree Wells.

Step 3. Tree Wells: [Projects that do not use Tree Wells do not use this Step.] When the project includes Tree Wells per SD-A, provide required inputs to demonstrate that the requirements for Tree Wells are satisfied.

DISCLAIMER:

The County of San Diego has developed this tool in an effort to streamline traditionally complex efforts associated with planning, design, submittal, and review of PDPs. While the calculations performed herein are deemed to be in compliance with 2013 MS4 Permit requirements, applicants may elect to provide their own calculations. Use of this tool is optional and the County will not be held liable for any errors or other negative impacts associated with its use. In the event that the County performs updates to these worksheets, applicants that have not established reliance on previous versions of the worksheet via discretionary approval may be required to utilize the latest version of the worksheets. A summary of version releases is included below.

QUESTIONS:

-Questions relating to specific projects, submittal requirements, approval process, and/or policy-related issues should be directed your PDS Land Development Project Manager (link below).

[PDS Land Development Project Manager](#)

-General questions/comments on this worksheet may be directed via email to BMP.Program@sdcounty.ca.gov with the subject line "SSD-BMP assistance."

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA-3	DMA-4									unitless
	2	85th Percentile 24-hr Storm Depth	0.56	0.56									inches
	3	Is Hydromodification Control Applicable?	Yes	No									yes/no
	4	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	10,503	3,318									sq-ft
	5	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)	10,240										sq-ft
	7	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	8	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	9	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	10	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
SSD-BMPs Proposed	11	Does Tributary Incorporate Dispersion and/or Rain Barrels?	No	No									yes/no
	12	Does Tributary Incorporate Tree Wells?	Yes	Yes									yes/no
Dispersion Area & Rain Barrel Inputs (Optional)	13	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)											sq-ft
	14	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	15	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	16	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	17	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)											sq-ft
	18	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)											sq-ft
	19	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Initial Runoff Factor Calculation	22	Total Tributary Area	20,743	3,318	0	0	0	0	0	0	0	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.51	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.51	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	26	Initial Design Capture Volume	494	139	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustment & Rain Barrel Adjustment	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area for DCV Reduction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.51	0.90	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	494	139	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	34	Final Adjusted Runoff Factor	0.51	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	35	Final Effective Tributary Area	10,579	2,986	0	0	0	0	0	0	0	0	sq-ft
	36	Initial Design Capture Volume Retained by Dispersion Area and Rain Barrel(s)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	37	Remaining Design Capture Volume Tributary to Tree Well(s)	494	139	0	0	0	0	0	0	0	0	cubic-feet
No Warning Messages													
DMA-4 will be treated via Green Street Standards. This County worksheet has been used to size the street BMP. Please see Attachment 13 of this SWQMP for Green Street PDP Exemption Form.													

SSD-BMP Automated Worksheet I-2: Step 2. Dispersion Area Validation (V1.0)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Dispersion Area Inputs	1	Drainage Basin ID or Name	-	-	-	-	-	-	-	-	-	-	unitless
	2	Final Design Capture Volume (DCV)	-	-	-	-	-	-	-	-	-	-	cubic-feet
	3	Is Hydromodification Control Applicable?	-	-	-	-	-	-	-	-	-	-	yes/no
	4	Total Impervious Area Dispersed to Pervious Surface	-	-	-	-	-	-	-	-	-	-	sq-ft
	5	Total Engineered Pervious Surface and/or Natural Soil Dispersion Area (Does Not Include Semi-Pervious Surfaces Serving as Dispersion Area)	-	-	-	-	-	-	-	-	-	-	sq-ft
	6	Ratio of Dispersed Impervious Area to Total Engineered Pervious Surface and/or Natural Soil Dispersion Area	-	-	-	-	-	-	-	-	-	-	unitless
	7	Dispersion Area Length (Length of Sheet Flow Across Dispersion Area)											feet
	8	Dispersion Area Slope											%
	9	Thickness of Amended Soil											inches
	10	How is Flow Dispersed Across Width of Dispersion Area (definitions below*)?											unitless
Results	11	Is DCV Requirement Fully Satisfied by Dispersion Area?	-	-	-	-	-	-	-	-	-	-	yes/no
	12	Is Hydromodification Control Requirement Satisfied by Dispersion Area?	-	-	-	-	-	-	-	-	-	-	yes/no
	13	Are Dispersion Area Length, Slope, and Thickness of Amended Soil (when applicable) Adequate?	-	-	-	-	-	-	-	-	-	-	yes/no
No Warning Messages													

Notes:

***How is Flow Dispersed Across Width of Pervious Dispersion Area?**

Sheet Flow: Flow arrives as sheet flow across the width of the adjacent impervious area

Spreader(s): Flow is discharged from flow spreader(s) across the width of the pervious area

Roof Drains: Discharge from roof drains distributed across the width of the pervious area

Curb Cuts: Discharge from curb cuts distributed across the width of the pervious area

Other: Other (Describe in PDP SWQMP)

SSD-BMP Automated Worksheet I-3: Step 3. Tree Well Sizing (V1.0)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Tree Well Inputs	1	Drainage Basin ID or Name	DMA-3	DMA-4	-	-	-	-	-	-	-	-	unitless
	2	Design Capture Volume Tributary to BMP	494	139	-	-	-	-	-	-	-	-	cubic-feet
	3	Is Hydromodification Control Applicable?	Yes	No	-	-	-	-	-	-	-	-	yes/no
	4	Predominant NRCS Soil Type Within Tree Well(s) Location	D	D									unitless
	5	Select a Tree Species for the Tree Well(s) Consistent with SD-A Tree Palette Table Note: Numbers shown in list are Tree Species Mature Canopy Diameters	20' - Catalina Cherry	20' - Catalina Cherry									unitless
	6	Tree Well(s) Soil Depth (Installation Depth) Must be 30, 36, 42, or 48 Inches; Select from Standard Depths**	30	30									inches
	7	Number of Identical* Tree Wells Proposed for this DMA	8	1									trees
	8	Proposed Width of Tree Well(s) Soil Installation for One (1) Tree	10.0	10.0									feet
	9	Proposed Length of Tree Well(s) Soil Installation for One (1) Tree	25.1	25.1									feet
Tree Data	10	Botanical Name of Tree Species	Prunus Lynoii	Prunus Lynoii	-	-	-	-	-	-	-	-	unitless
	11	Tree Species Mature Height per SD-A	40	40	-	-	-	-	-	-	-	-	feet
	12	Tree Species Mature Canopy Diameter per SD-A	20	20	-	-	-	-	-	-	-	-	feet
	13	Minimum Soil Volume Required In Tree Well (2 Cubic Feet Per Square Foot of Mature Tree Canopy Projection Area)	628	628	-	-	-	-	-	-	-	-	cubic-feet
	14	Credit Volume Per Tree	180	180	-	-	-	-	-	-	-	-	cubic-feet
Tree Well Sizing Calculations	15	DCV Multiplier To Meet Flow Control Requirements	2.90	n/a	-	-	-	-	-	-	-	-	unitless
	16	Required Retention Volume (RRV) To Meet Flow Control Requirements	1433	n/a	-	-	-	-	-	-	-	-	cubic-feet
	17	Number of Trees Required	8	1	-	-	-	-	-	-	-	-	trees
	18	Total Area of Tree Well Soil Required for Each Tree	251	251	-	-	-	-	-	-	-	-	sq-ft
	19	Approximate Required Width of Tree Well Soil Area for Each Tree	16	16	-	-	-	-	-	-	-	-	feet
	20	Approximate Required Length of Tree Well Soil Area for Each Tree	16	16	-	-	-	-	-	-	-	-	feet
	21	Number of Trees Proposed for this DMA	8	1	-	-	-	-	-	-	-	-	trees
	22	Total Area of Tree Well Soil Proposed for Each Tree	251	251	-	-	-	-	-	-	-	-	sq-ft
	23	Minimum Spacing Between Multiple Trees To Meet Soil Area Requirements (when applicable)***	25.1	n/a	-	-	-	-	-	-	-	-	feet
Results	24	Are Tree Well Soil Installation Requirements Met?	Yes	Yes	-	-	-	-	-	-	-	-	yes/no
	25	Is Remaining DCV Requirement Fully Satisfied by Tree Well(s)?	Yes	Yes	-	-	-	-	-	-	-	-	yes/no
	26	Is Hydromodification Control Requirement Satisfied by Tree Well(s)?	Yes	n/a	-	-	-	-	-	-	-	-	yes/no
No Warning Messages													
DMA-4 will be treated via Green Street Standards. This County worksheet has been used to size the street BMP. Please see Attachment 13 of this SWQMP for Green Street PDP Exemption Form.													

Notes:
*If using more than one mature canopy diameter within the same DMA, only the smallest mature canopy diameter should be entered. Alternatively, if more than one mature canopy diameter is proposed and/or the dimensions of multiple tree well installations will vary, separate DMAs may be delineated.
**If the actual proposed installation depth is not available in the table of standard depths, select the next lower depth.
***Tree Canopy or Agency Requirements May Also Influence the Minimum Spacing of Trees.

Appendix K: Guidance on Green Infrastructure

Table K.2-1 : Green Street Performance Standard Calculations

Item		Value	Description
Required Treatment Volume	1	Land Use of Net Impervious Area	Transportation <i>Per project drawings.</i>
	2	Total Net Impervious Area ¹²	3,318 ft ² <i>Per project drawings.</i>
	3	85 th Percentile Rainfall Depth	0.56 in. <i>Determine per BMPDM Appendix B.1.</i>
	4	Runoff Coefficient	0.90 <i>Value of 0.90 applies to new impervious areas.</i>
	5	Required Treatment Volume	139 ft ³ <i>(Line 2 × Line 3 × Line 4) / 12</i>
Provided Treatment Volume	6	Land Use of Treated Area ¹³	Transportation <i>Per project drawings.</i>
	7	Land Use Factor ¹⁴	1.0 <i>Determine per Note 5 below.</i>
	8	Conventional Treatment Volume ¹⁵	139 ft ³ <i>Determine per Note 6 below.</i>
	9	Alternative Treatment Volume	N/A <i>Determine per supplemental applicant calculations.</i>
	10	Final Treatment Volume	139 ft ³ <i>Line 7 × (Line 8 + Line 9)</i>
Result	11	Is Project Green Street Compliant?	Yes <i>Compliant if Line 10 ≥ Line 5. Otherwise, non-compliant.</i>
	12	Optional Credit	0 <i>(Line 7 × Line 8) – Line 5</i>

¹² The Net Increase in Impervious Area should **not** reflect any work occurring within existing impervious areas.

¹³ Classify drainage area into following land use types (may use more than one) agriculture, commercial, education, industrial, multi-family residential, orchard, rural residential, single family residential, transportation, open space.

¹⁴ If Land Uses from Lines 1 and 6 match, use a value of 1.0. Otherwise, refer to Regional Water Quality Equivalency Guidance for determination of appropriate Land Use Factor.

¹⁵ Conventional Treatment Volume may be determined by subtracting the project's total "Deficit of Effectively Treated Stormwater" from the project's total Design Capture Volume. These values can be found in Version 2.0 of the County of San Diego Automated Control Worksheet on Line 48 of the BMP Performance Tab and Line 26 of the DCV Tab respectively.