County of San Diego

Stormwater Quality Management Plan (SWQMP)

For Priority Development Projects (PDPs)

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

Project Information	
Project Name	Paradise Valley Gas Station
Project Address	South East Corner of Paradise Valley Rd. & Elkelton Blvd
Assessor's Parcel # (APN)	584-160-5200
Permit # / Record ID	PDS2019-ZAP-19-003

Project Applicant / Project Proponent		
Name	Joseph Brikho	
Address	245 Highland Avenue, National City, CA 91950	
Phone	(619) 726-7741	**Email:** josephbrikho@yahoo.com

SWQMP Preparer		
Name	Mellor Landy	
Company (if applicable)	Howes Weiler Landy	
Address	2888 Loker Avenue East, Suite 217, Carlsbad CA, 92010	
Phone	(760) 929-2288	**Email:** mel@hwl-pe.com
PE Number (if applicable)	81085	

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 Mellor Landy **Date** December 19, 2022

COUNTY ACCEPTED

SWQMP Approved By: *Approval Date*:

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

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	11/8/2019	Initial Submittal
2	6/1/2020	Summary of Change
3	3/26/2021	Summary of Change
4	4/1/2022	Summary of Change
5	2/10/2023	Summary of Change
Final Design		
1	Date	Initial Submittal
2	Date	Summary of Change
3	Date	Summary of Change
4	Date	Summary of Change
No.	Date	Summary of Change
Plan Changes		
1	Date	Initial Submittal
2	Date	Summary of Change
3	Date	Summary of Change
4	Date	Summary of Change
No.	Date	Summary of Change

PDP SWQMP Submittal Checklist

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

☒ Table 1: Scope of SWQMP Submittal ..... Page 2

☒ Table 2: Baseline BMPs for Existing Natural Features and Proposed Features (Groups 1, 2, and 3) ..... Page 3

☒ Table 3: Baseline BMPs for Pollutant-generating Sources (Group 4) ..... Page 4

☒ Table 4: Infeasibility Justifications for Baseline BMPs ..... Page 5

☒ Table 5: DMA Structural Compliance Strategies and Documentation ..... Page 6

☒ Table 6: Critical Coarse Sediment Yield Area (CCSYA) Requirements ..... Page 7

☒ Table 7: Minimum Construction Stormwater BMPs ..... Page 8

☒ Table 8: Infeasibility Justifications for Construction BMPs ..... Page 9

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

☒ Attachment 1: Storm Water Intake Form

☒ Attachment 2: DMA Exhibits and Construction Plan Sheets

☒ Attachment 3: Source Control BMP Worksheet

☒ 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: Installation Verification Form

☒ Attachment 11: BMP Maintenance Agreements and Plans

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

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

[1] All SWQMP attachments are available at www.sandiego.gov/stormwater under the Development Resources tab. Some attachments are presented out of order because they are shared between multiple SWQMP forms.

Table 1 – Scope of SWQMP Submittal

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

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

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

This report addressed the entire developed conditon of the site, which includes parking area, trash enclosure, building and carwash.

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

There will be no future elements, or phases with this project.

Table 2 – Baseline BMPs for Existing and Proposed Site Features

Site Features Select each feature that applies.		BMP Implementation Describe BMP implementation for each selected site feature.				
Group 1: Existing Natural Site Features [See BMPDM Sections 4.3.1 and 4.3.2]						
		Maintain & conserve natural features (SD-G)		**Establish buffers for waterbodies (SD-H)**		
		Full	Partial	Full	Partial	
☐	**Natural waterbodies**	☐	☐	☐	☐	
☐	**Natural storage reservoirs & drainage corridors**	☐	☐			
☒	**Natural areas, soils, & vegetation (incl. trees)**	☒	☐			
Group 2: Common Impervious Outdoor Site Features [See BMPDM Sections 4.3.3 and 4.3.5]						
		Disperse impervious areas (SD-B)		**Use permeable materials (SD-D)**		**Minimize impervious areas (SD-I)**
		Full	Partial	Full	Partial	
☐	**Streets and roads**	☐	☐	☐	☐	☒ Check here to confirm that impervious surfaces have been minimized where applicable and feasible for all outdoor impervious areas. If not, explain in Table 3.
☐	**Sidewalks & walkways**	☐	☐	☐	☐	
☒	**Parking areas & lots**	☐	☒	☐	☐	
☒	**Driveways**	☐	☒	☐	☐	
☐	**Patios, decks, & courtyards**	☐	☐	☐	☐	
☐	**Hardcourt recreation areas**	☐	☐	☐	☐	
☐	Add impervious feature	☐	☐	☐	☐	
☐	Add impervious feature	☐	☐	☐	☐	
☐	Add impervious feature	☐	☐	☐	☐	
Group 3: Other Outdoor Site Features [See BMPDM Sections 4.2.6, 4.3.4, 4.3.5, 4.3.7, and 4.3.8]						
☒	**Rooftop areas**	**Disperse rooftop runoff (SD-B)**		**Install green roofs (optional; SD-C)**		**Use rain barrels to capture runoff (optional; SD-E)**
		Full	Partial	Full	Partial	Full / Partial
		☐	☒	☐	☐	☐ / ☐
☒	**Landscaped areas**	**Use water-efficient landscaping (SD-J)**		**Install efficient irrigation systems (SD-K)**		**Minimize erosion of slopes and surfaces (SD-L)**
		Full	Partial	Full	Partial	Full / Partial
		☒	☐	☐	☐	☐ / ☐
☐	**Water features (pools, spas, etc.)**	**Provide a designated washing area (SC-A)**		**Drain feature to the sanitary sewer (if allowed) (SC-B)**		**Drain feature to a pervious area (SC-C)**
		Full	Partial	Full	Partial	Full / Partial
		☐	☐	☐	☐	☐ / ☐

Note: Justification is required in Table 4 for any feature not selecting at least one BMP (either full or partial implementation). For Group 2 features this means not selecting either SD-B or SD-D. Additional justifications may be required on request by County staff. Also use Table 4 to describe sources or BMPs other than those listed.

Table 3 –Baseline BMPs for Pollutant-generating Sources (Group 4)

A. Requirements for Documentation Select either or both as applicable.	Completion of Part B is not required because: ☐ This is a Small Residential Project, OR ☐ None of these sources or features is proposed.	☒ ***Source Control BMP Requirements Worksheet E.1-1*** (SC in Appendix E of the BMP Design Manual) is included as **Attachment 3** (optional unless requested by County staff).

B. Sources and BMPs Select all proposed sources and features below. Then select the BMPs on the right to be implemented for each.	**SC-B** Plumb to sanitary sewer	**SC-C** Drain feature to a pervious area	**SC-D** Provide containment for spills and discharges	**SC-E** Prevent contact with rainfall	**SC-F** Isolate flows from adjacent areas	**SC-G** Prevent wind dispersal	**SC-H** Label with stencils or signs
Common Source Areas							
☒ **Trash & Refuse Storage**	☐	---	☐	☒	☒	☒	---
☐ **Materials & Equipment Storage**	☐	---	☐	☐	☐	☐	---
☐ **Loading & Unloading**	☐	---	☐	☐	☐	---	---
☒ **Fueling**	☐	---	☐	☒	☒	---	---
☐ **Maintenance & Repair**	☐	---	☐	☐	☐	---	---
☐ **Vehicle & Equipment Cleaning**	☐	---	☐	☐	☐	---	---
☒ **Food Preparation or Service**	☒	---	☐	☐	☐	---	---
Distributed Features							
☒ **Storm drain inlets & catch basins**	---	---	---	---	---	---	☒
☒ **Interior floor drains and sumps**	☒	---	---	---	---	---	---
☐ **Drain lines (air conditioning, etc.)**	☐	☐	☐	---	---	---	---
☐ **Fire test sprinkler discharges**	☐	☐	☐	---	---	---	---

Provide the following in Table 4: (1) justification of any source area or feature with NO BMPs selected, (2) justification of individual unselected BMPs *if requested by County staff*, and (3) identification of any proposed pollutant-generating sources and BMPs not listed here.

Note: Pollutant-generating sources and features may not discharge directly to the MS4. Discharging to any of the stormwater BMPs identified in Table 5 Part B is also discouraged. If doing so, however, the source or feature area must be included in applicable DCV calculations.

Table 4 – Explanations and Justifications for Table 2 and 3 Baseline BMPs

☒ **Check here if no explanations or justifications for Table 2 or 3 BMPs are required.**		
• **Required Justifications**: If NO BMPs are selected for a source or feature, justify why <u>all</u> BMPs are either not applicable or are infeasible. For Group 2 features NO BMPs means not selecting either SD-B or SD-D. • **If Requested**: Justify why individual BMPs will not be implemented or will only be partially implemented. • **Additional Explanation**: Describe any proposed features and/or BMPs not listed in Tables 2 or 3.		
BMP-Feature Combination		**Explanation**
Feature	Groupe 2 - Parking lots and driveways	Designated features are partially implemented, site is fairly flat with grades less than 2% across entire site. all flows are surface flows meaning impervious areas do not drain directly to the a storm drain system, allowing for minimal piping theirfor limiting the concentrated flows. Once the flows are eventually captured by the trench drain located in the driveway flows discharge onto the energy dissipating rip rap. Even though SD-8 is not met entirely it does meet the minimal piping, engergy dissipation, soild amendents maintaining infiltraiton rates and treatement of routed flows and overflow routing of excess flows to be conbeyed from dispersoin area to the storm drain.
BMP	BMP 1	
Feature	Groupe 3- Roof Areas	Roof area, is located south east of BMP 1, portions of the roof will discharge directly into BMP 1, the remaining protion will be discharged as surface flows onto the parking lot allowing for flow to dispered before being collected by the Trench drain located and the driveway.
BMP	BMP 1	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	

Table 5: DMA Structural Compliance Strategies and Documentation

Part A – Selection and Application Structural Performance Standards

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

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

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

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

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

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

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

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

Part B – Compliance Strategies and Required Attachments

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

Att. 1	Att. 2	Att. 3	Att. 4	Att. 5
Storm Water Intake Form ☒	DMA Exhibits and Construction Plan Sheets ☒	Source Control BMP Worksheet (see Page 3) ☒	Previous SWQMP Submittals (see Page 1) ☒	Existing Site and Drainage Description ☒

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

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

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

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

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

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

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

☒ **WMAA mapping demonstrates the following:**

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

b. All potential upstream offsite CCYSAs will be bypassed

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

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

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

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

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

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**

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

Table 7 –Minimum Construction Stormwater BMPs

Minimum Required BMPs by Activity Type Select all applicable activities and at least one BMP for each	References Caltrans[3]	 County of San Diego	
☒ **Erosion Control for Disturbed Slopes** (choose at least 1 per season)			
☒ Vegetation Stabilization Planting[4] (Summer)	SS-2, SS-4		
☐ Hydraulic Stabilization Hydroseeding[9] (Summer)	SS-4		
☒ Bonded Fiber Matrix or Stabilized Fiber Matrix[5] (Winter)	SS-3		
☐ Physical Stabilization Erosion Control Blanket[7] (Winter)	SS-7		
☒ **Erosion control for disturbed flat areas (slope < 5%)**			
☒ County Standard Lot Perimeter Protection Detail	SC-2	PDS 659[6]	
☐ 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[7]	
☐ 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[8]	
☐ **Sediment control for all disturbed areas**			
☒ Silt Fence	SC-1		
☐ Fiber Rolls (Straw Wattles)	SC-5		
☒ Gravel & Sand Bags	SC-6, SC-8		
☐ Dewatering Filtration	NS-2		
☒ Storm Drain Inlet Protection	SC-10		
☐ Engineered Desilting Basin (sized for 10-year flow)	SC-2		
☒ **Preventing offsite tracking of sediment**			
☒ Stabilized Construction Entrance	TC-1		
☐ Construction Road Stabilization	TC-2		
☐ Entrance/Exit Tire Wash	TC-3		
☐ Entrance/Exit Inspection & Cleaning Facility	TC-1		
☐ Street Sweeping and Vacuuming	SC-7		
☒ **Materials Management**			
☒ Material Delivery & Storage	WM-1		
☒ Spill Prevention and Control	WM-4		
☒ **Waste Management[9]**			
☒ Waste Management Concrete Waste Management	WM-8		
☒ Solid Waste Management	WM-5		
☒ Sanitary Waste Management	WM-9		
☐ Hazardous Waste Management	WM-6		

[3] See Caltrans 2017 Storm Water Quality Handbooks, Construction Site BMP Manual, available at: (http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm)
[4] 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.
[5] All slopes over three feet must have established vegetative cover prior to final permit approval.
[6] County PDS 659. Standard Lot Perimeter Protection Design System (Bldg. Division)
[7] County PDS 660. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Bldg. Division
[8] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater (also acceptable for velocity reduction)
[9] Applicants are responsible to apply appropriate BMPs for specific wastes (e.g., BMP WM-8 for concrete).

Table 8 – Explanations and Justifications for Construction Phase BMPs

☒ **Check here if no explanations or justifications for Table 7 BMPs are required.**		
Justifications for Table 7 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 7.		
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	

ATTACHMENT 1
Storm Water Intake Form

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

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

Part 1. Project Information	
Project Name:	Paradise Valley Gas Station
Record ID (Permit) No(s):	PDS2019-ZAP-19-003
Assessor's Parcel No(s):	584-160-5200
Street Address (or Intersection):	South East Corner of Paradise Valley Rd. & Elkelton Blvd
City, State, Zip:	Spring Valley, CA 91977

Part 2. Applicant / Project Proponent Information	
Name:	Jose Sanchez
Company:	Howes Weiler Landy
Street Address:	2888 Loker Avenue East, Suite 217
City, State, Zip:	Carlsbad CA, 92010
Phone Number	(760) 929-2288
Email:	jsanchez@hwl-pe.com

Part 3. Required Information for All Development Projects

Ⓐ	**1. Existing (pre-development) impervious surfaces (ft²)**	**2. Created or replaced impervious surfaces (ft²)**	**3. Total disturbed area (acres or ft²)**
	0 S.F.	17,678 S.F.	21,458 S.F.

Ⓑ	☐ 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)**

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

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

Part 4. Priority Classification & SWQMP Form Selection

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

Part 5. Applicant Signature

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

Applicant / Project Proponent Signature: Date: 05/20/2020

- ***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.

ATTACHMENT 2
DMA Exhibits and Construction Plan Sheets

2.0 General Requirements

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

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

2.1 DMA Exhibits

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

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

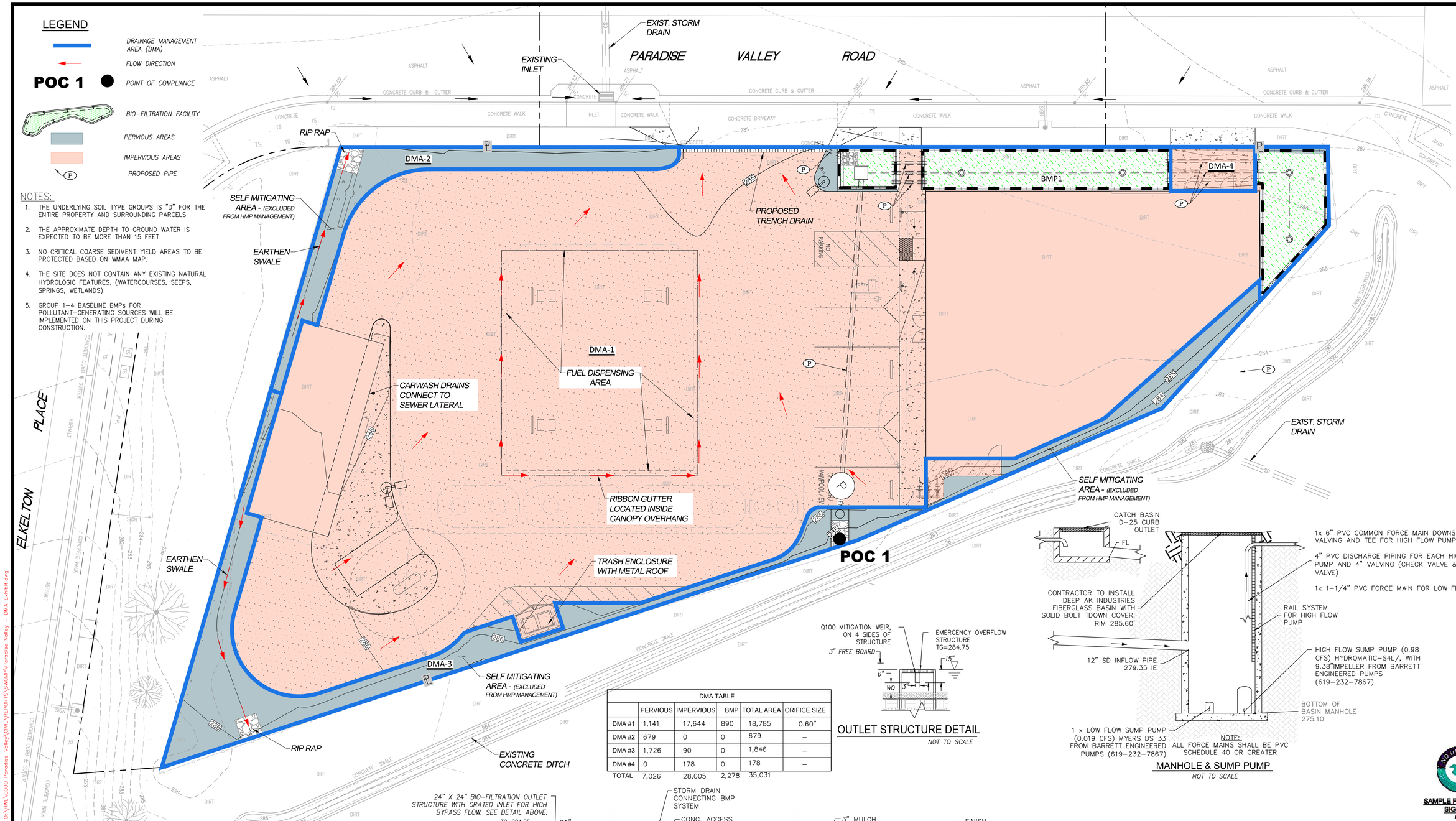
[1] Group 1-4 features and baseline BMPs from PDP SWQMP Tables 2 and 3.
[2] Minimum Construction Stormwater BMPs from PDP SWQMP Table 7.
[3] Identify the location, ID numbers, type, and size/detail of BMPs.

LEGEND

- DRAINAGE MANAGEMENT AREA (DMA)
- FLOW DIRECTION
- POC 1 — POINT OF COMPLIANCE
- BIO–FILTRATION FACILITY
- PERVIOUS AREAS
- IMPERVIOUS AREAS
- (P) — PROPOSED PIPE

NOTES:

1. THE UNDERLYING SOIL TYPE GROUPS IS "D" FOR THE ENTIRE PROPERTY AND SURROUNDING PARCELS
2. THE APPROXIMATE DEPTH TO GROUND WATER IS EXPECTED TO BE MORE THAN 15 FEET
3. NO CRITICAL COARSE SEDIMENT YIELD AREAS TO BE PROTECTED BASED ON WMAA MAP.
4. THE SITE DOES NOT CONTAIN ANY EXISTING NATURAL HYDROLOGIC FEATURES. (WATERCOURSES, SEEPS, SPRINGS, WETLANDS)
5. GROUP 1–4 BASELINE BMPs FOR POLLUTANT–GENERATING SOURCES WILL BE IMPLEMENTED ON THIS PROJECT DURING CONSTRUCTION.

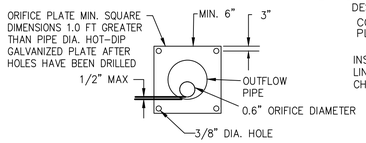


SCALE: 1" = 10'

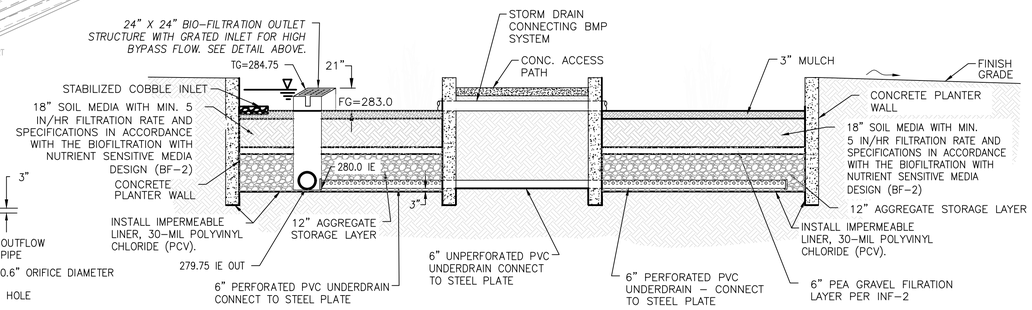
DMA TABLE					
	PERVIOUS	IMPERVIOUS	BMP	TOTAL AREA	ORIFICE SIZE
DMA #1	1,141	17,644	890	18,785	0.60"
DMA #2	679	0	0	679	–
DMA #3	1,726	90	0	1,846	–
DMA #4	0	178	0	178	–
TOTAL	7,026	28,005	2,278	35,031	

OUTLET STRUCTURE DETAIL
NOT TO SCALE

MANHOLE & SUMP PUMP
NOT TO SCALE



STAINLESS STEEL PLATE / ORIFICE DETAIL
NOT TO SCALE



PRIVATE BIO FILTRATION FACILITY DETAIL
NOT TO SCALE

SAMPLE PROHIBITIVE SIGNAGE
NTS

PERMANENT WATER QUALITY TREATMENT FACILITIES ON THIS SITE

KEEPING OUR WATER CLEAN
MAINTAIN WITH CARE
NO MODIFICATIONS WITHOUT COUNTY OF SAN DIEGO APPROVAL

WATER QUALITY ADVISORY SIGN
NTS

PREPARED BY:

HOWES | WEILER | LANDY
PLANNING & ENGINEERING
Tel. 760.929.2288 Fax. 760.929.2287
2888 LOKER AVENUE EAST SUITE 217
CARLSBAD, CA 92010
www.HWL-PE.com

REGISTERED PROFESSIONAL ENGINEER — MELLOR R. LANDY — No. 81085 Exp. 09–30–23 CIVIL — STATE OF CALIFORNIA

MELLOR R. LANDY DATE
R.C.E. 81085 EXP. 9–30–23

DMA/HMP MAP EXHIBIT

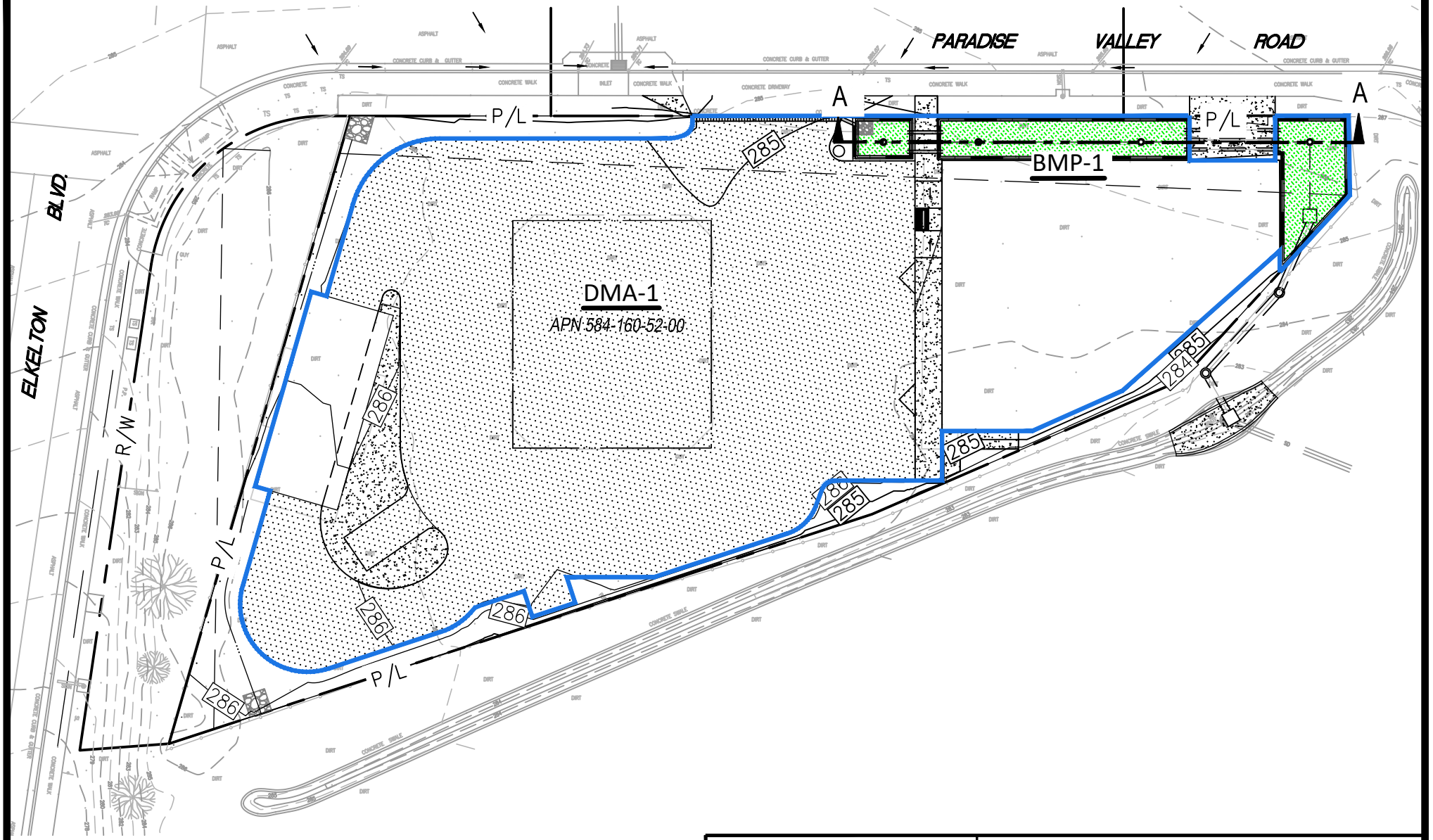
2–02–2023

SAVE DATE: 2/2/2023 ~ PLOT DATE: 2/2/2023 ~ FILE NAME: G:\HWL\0000 Paradise Valley\CIVIL\REPORTS\SWQMP\Paradise Valley – DMA Exhibit.dwg

2.2 Individual Structural BMP DMA Mapbook

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

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



SCALE: 1" = 30'

30 15 0 30

HOWES | WEILER | LANDY
PLANNING & ENGINEERING
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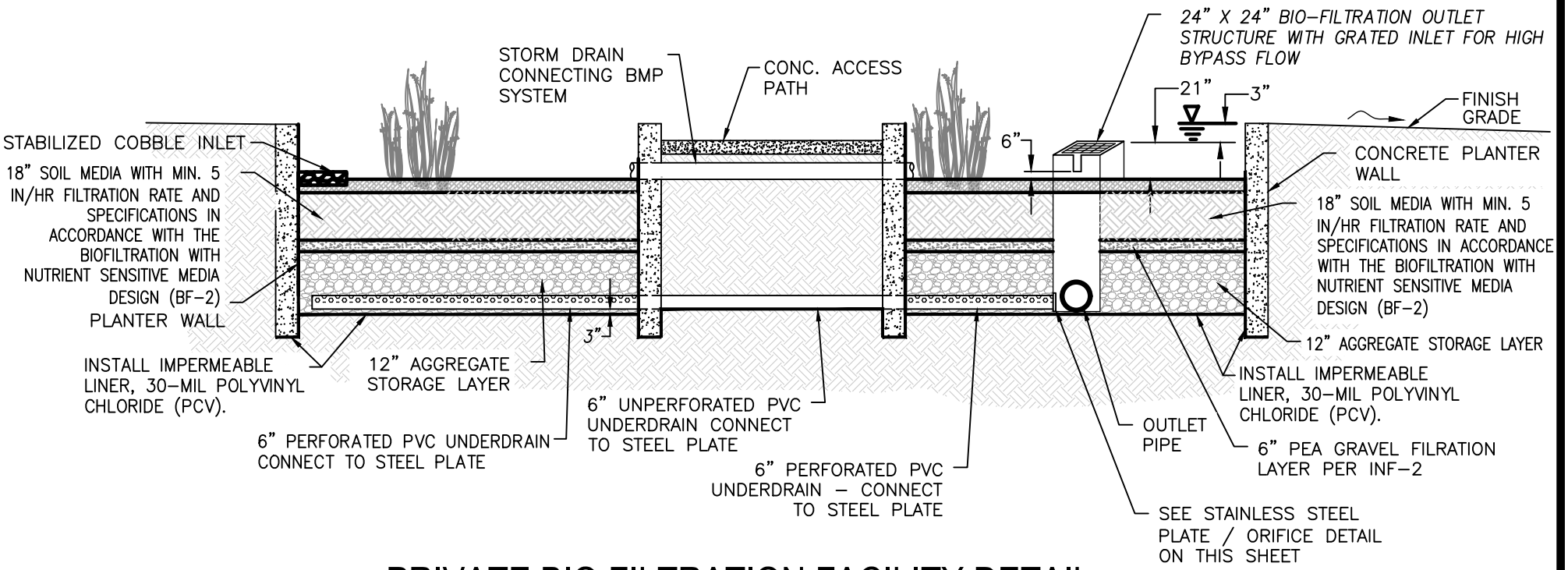
2888 LOKER AVENUE EAST SUITE 217
CARLSBAD, CA 92010

PARADISE VALLEY GAS STATION
PDS2019-ZAP-19-003,
PDS2020-ER-20-18-001
BMP DETAIL

DATE: 12/19/22

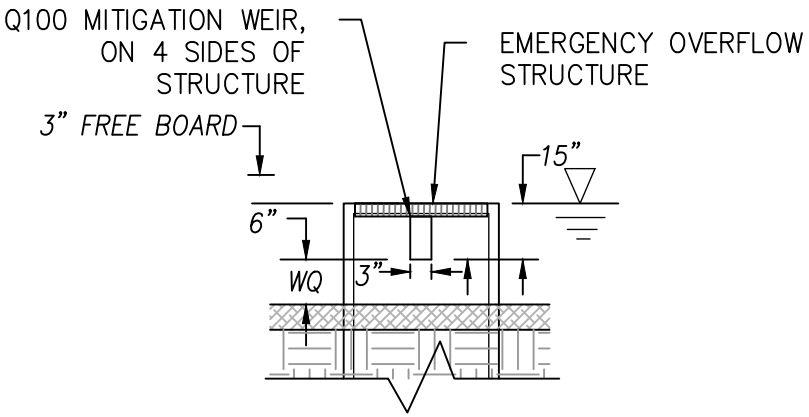
DRAWING:

SHEET 1 OF 2



PRIVATE BIO FILTRATION FACILITY DETAIL

NOT TO SCALE



OUTLET STRUCTURE DETAIL

NOT TO SCALE

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2888 LOKER AVENUE EAST SUITE 217
CARLSBAD, CA 92010

PARADISE VALLEY GAS STATION
PDS2019-ZAP-19-003,
PDS2020-ER-20-18-001
BMP DETAIL

DATE: 12/19/22

DRAWING:

SHEET 2 OF 2

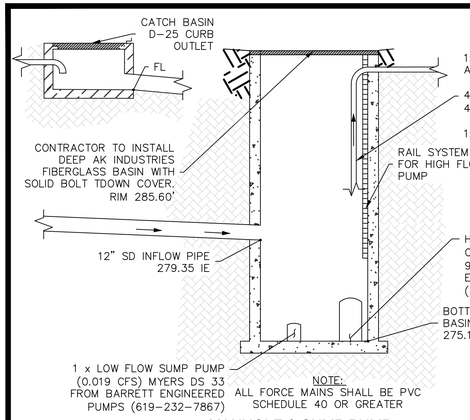
2.3 Construction Plan Sets

- 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).

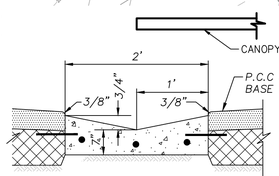
Plan Type	
Required Information[4]	
☐ Structural BMP(s) and Significant Site Design BMPs (if applicable) with ID numbers.	
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit.	
☐ Details and specifications for construction of Structural BMP(s) and Significant Site Design BMPs (if applicable).	
☒ Signage indicating the location and boundary of structural BMP(s) as required by County staff.	
☐ How to access the structural BMP(s) to inspect and perform maintenance.	
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds).	
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP).	
☐ Recommended equipment to perform maintenance.	
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management.	
☐ Include landscaping plan sheets (if available) showing vegetation requirements for vegetated structural BMP(s).	
☐ All BMPs must be fully dimensioned on the plans.	
☐ When proprietary BMPs are used, site-specific cross-section with outflow, inflow, and manufacturer model number must be provided. Photocopies of general brochures are not acceptable.	
☐ Include all source control and site design measures described in the SWQMP.	
☒ Include all construction BMPs described in the SWQMP.	

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

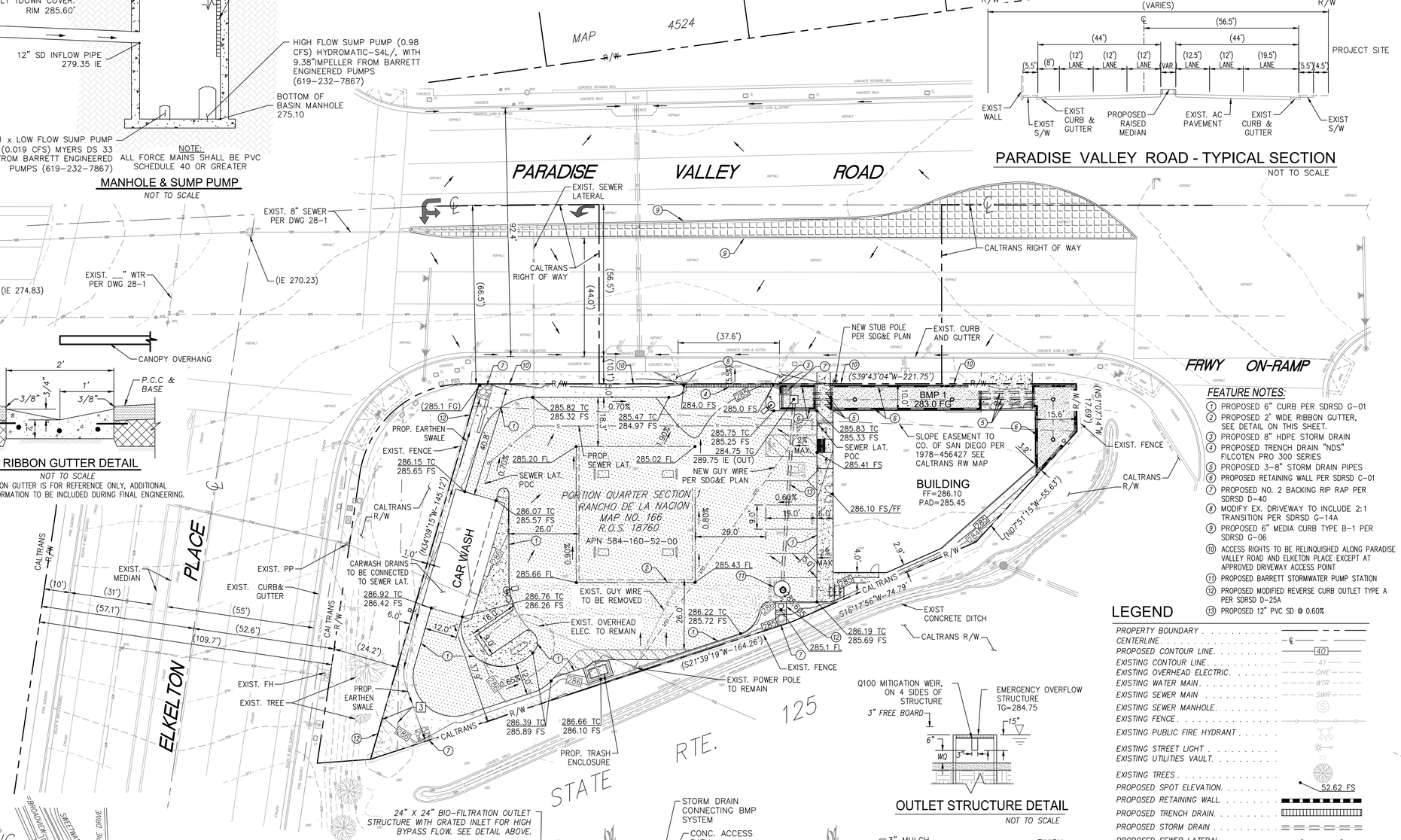
PRELIMINARY GRADING PLAN
PARADISE VALLEY GAS STATION
PDS2019-ZAP-19-003, PDS2020-ER-20-18-001



MANHOLE & SUMP PUMP
NOT TO SCALE



2' RIBBON GUTTER DETAIL
NOT TO SCALE
NOTE: RIBBON GUTTER IS FOR REFERENCE ONLY, ADDITIONAL DETAIL INFORMATION TO BE INCLUDED DURING FINAL ENGINEERING.



PARADISE VALLEY ROAD - TYPICAL SECTION
NOT TO SCALE

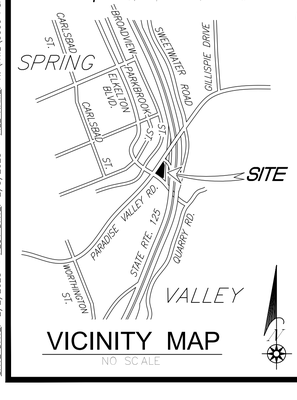
FEATURE NOTES:

1. PROPOSED 6" CURB PER SDRSD G-01
2. PROPOSED 2' WIDE RIBBON GUTTER, SEE DETAIL ON THIS SHEET.
3. PROPOSED 8" HDPE STORM DRAIN
4. PROPOSED TRENCH DRAIN "NDS" FILCOTEN PRO 300 SERIES
5. PROPOSED 3-8" STORM DRAIN PIPES
6. PROPOSED RETAINING WALL PER SDRSD C-01
7. PROPOSED NO. 2 BACKING RIP RAP PER SDRSD D-40
8. MODIFY EX. DRIVEWAY TO INCLUDE 2:1 TRANSITION PER SDRSD G-14A
9. PROPOSED 6" MEDIA CURB TYPE B-1 PER SDRSD G-06
10. ACCESS RIGHTS TO BE RELINQUISHED ALONG PARADISE VALLEY ROAD AND ELKETON PLACE EXCEPT AT APPROVED DRIVEWAY ACCESS POINT
11. PROPOSED BARRETT STORMWATER PUMP STATION
12. PROPOSED MODIFIED REVERSE CURB OUTLET TYPE A PER SDRSD D-25A
13. PROPOSED 12" PVC SD @ 0.60%

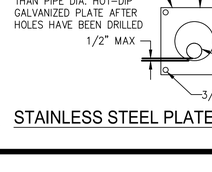
LEGEND

- PROPERTY BOUNDARY
- CENTERLINE
- PROPOSED CONTOUR LINE (40)
- EXISTING CONTOUR LINE (41)
- EXISTING OVERHEAD ELECTRIC (OHE)
- EXISTING WATER MAIN (WTR)
- EXISTING SEWER MAIN (SWR)
- EXISTING SEWER MANHOLE (S)
- EXISTING FENCE
- EXISTING PUBLIC FIRE HYDRANT
- EXISTING STREET LIGHT
- EXISTING UTILITIES VAULT
- EXISTING TREES
- PROPOSED SPOT ELEVATION (52.62 FS)
- PROPOSED RETAINING WALL
- PROPOSED TRENCH DRAIN
- PROPOSED STORM DRAIN
- PROPOSED SEWER LATERAL (S)
- PROPOSED RIP RAP
- PROPOSED STORMWATER PUMP STATION (P)
- PROPOSED REVERSED CURB OUTLET
- PROPOSED DRIVABLE PCC PAVEMENT
- PROPOSED CONC. WALKWAY
- PROPOSED LANDSCAPE
- PROPOSED BIO-BASIN

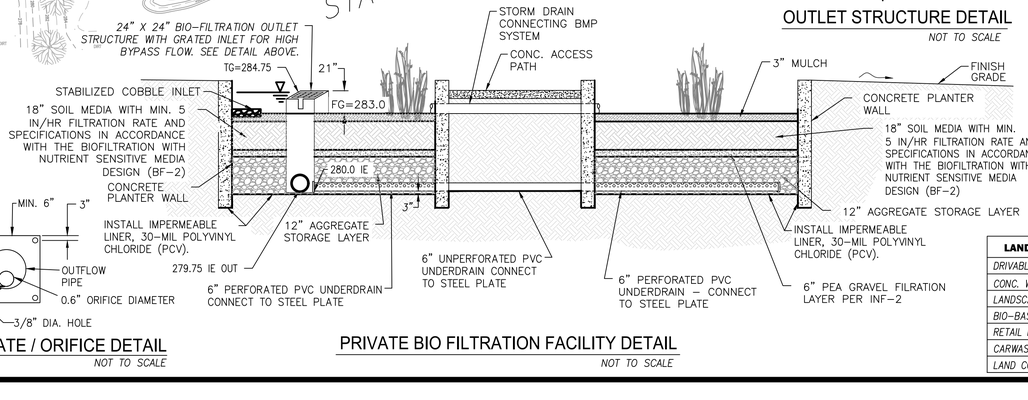
LAND COVER SUMMARY TABLE	
DRIVABLE PCC PAVEMENT	12,102 SF
CONC. WALKWAY	1,166 SF
LANDSCAPE	2,465 SF
BIO-BASIN	850 SF
RETAIL BLDG. AREA	3,555 SF
CARWASH BLDG. AREA	855 SF
LAND COVERAGE	82%



VICINITY MAP
NO SCALE

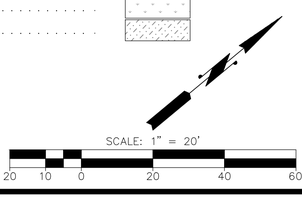


STAINLESS STEEL PLATE / ORIFICE DETAIL
NOT TO SCALE



PRIVATE BIO FILTRATION FACILITY DETAIL
NOT TO SCALE

OUTLET STRUCTURE DETAIL
NOT TO SCALE



SITE ADDRESS:

NORTH EAST CORNER OF PARADISE VALLEY ROAD AND ELKELTON BLVD
SPRING VALLEY, CA 91977
APN 584-160-52-00

LEGAL DESCRIPTION

THAT PORTION OF QUARTER SECTION 1 OF RANCHO DE LA NACION, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP NO. 166, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY AS CONVEYED IN FINAL ORDER OF CONDEMNATION TO THE STATE OF CALIFORNIA AS PARCEL 30173 OF SAID CONDEMNATION RECORDED JULY 14, 1998 AS INSTRUMENT NO. 1998-0435558 IN THE OFFICE OF SAID RECORDER.

EXISTING EASEMENTS

EASEMENTS AND EXCEPTIONS PER SCHEDULE B OF PRELIMINARY TITLE REPORT BY COMMONWEALTH LAND TITLE COMPANY - ORDER NO. 09193261-919-KRC-KRE, DATED AUGUST 1, 2017

1. *AGREEMENT FOR IMPROVEMENTS IN PUBLIC RIGHT-OF-WAY ORDINANCE 4815 EXECUTED BY CHARLES M. ERRECA, LOUISE ERRECA, ERNEST M. STANLEY & NINA G. STANLEY PER DOCUMENT RECORDED DECEMBER 4, 1978 AS INSTRUMENT NO. 78-520244 OF OFFICIAL RECORDS. NON-PLOTTABLE*
2. *THE OWNERSHIP OF SAID LAND DOES NOT INCLUDE RIGHTS OF ACCESS TO OR FROM THE STREET, HIGHWAY, OR FREEWAY ABUTTING SAID LAND, SUCH RIGHTS HAVING BEEN RELINQUISHED BY THE DOCUMENT RECORDED DECEMBER 8, 1999 AS INSTRUMENT NO. 999-0798894 OF OFFICIAL RECORDS. (NOTED HEREON) NON-PLOTABLE*
3. *AN EASEMENT FOR SLOPE PURPOSES IN FAVOR OF STATE OF CALIFORNIA PER DOCUMENT RECORDED DECEMBER 8, 1999 AS INSTRUMENT NO. 1999-0798894 OF OFFICIAL RECORDS. (PLOTTED HEREON)*

SITE AREA:

TOTAL SITE AREA (GROSS)	*21,458 S.F. (0.49 AC)*
NET SITE AREA	*21,458 S.F. (0.49 AC)*

OWNER/DEVELOPER

NAME: JOSEPH BRIKHO
ADDRESS: 245 HIGHLAND AVE.
NATIONAL CITY, CA 91950
PHONE NO.: (619) 726-7741

SOIL CONDITION

EXISTING UNDEVELOPED SITE

TOPOGRAPHY SOURCE

TOPOGRAPHY SHOWN ON THESE PLANS WAS GENERATED FIELD SURVEY OF THIS SITE WAS PERFORMED ON MARCH 6 & 8, 2018 BY STEVEN M. HOWELL, LAND SURVEYOR, LS 5758.

BENCHMARK

THE BENCHMARK FOR THIS SURVEY IS CITY OF SAN DIEGO CONTROL PT. NO. 1207, A LEAD WITH DISK STAMPED "SD CITY ENGINEER" IN THE TOP OF CURB AT 538 & 542 BROADVIEW STREET, NORTHEAST OF ELKELTON BLVD.
ELEVATION = 257.51 FEET NAVD88 DATUM

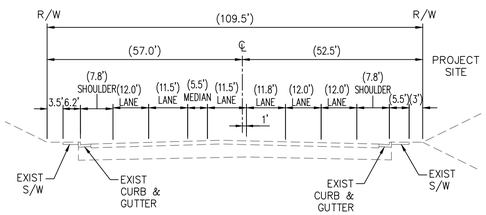
BASINS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE NORTHWESTERLY LINE OF SUBJECT PARCEL AS SHOWN ON RECORD OF SURVEY MAP NO. 18760, AS SHOWN HEREON. I.E NORTH 39°43'04" EAST

PRELIMINARY GRADING PLAN NOTE:

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

CUT (TO FINISH SURFACE)..... 100 CY
FILL (TO FINISH SURFACE)..... 650 CY
IMPORT/EXPORT..... 550 CY



ELKETON PLACE - TYPICAL SECTION
NOT TO SCALE

PREPARED BY:

HOWES | WEILER | LANDY
PLANNING & ENGINEERING
Tel. 760.929.2288 Fax. 760.929.2287
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CARLSBAD, CA 92010
www.HWL-PE.com

REGISTERED PROFESSIONAL ENGINEER
MELLOR R. LANDY
No. 81085
Exp. 09-30-23
CIVIL
STATE OF CALIFORNIA

MELLOR R. LANDY
R.C.E. 81085 EXP. 9-30-23
DATE

1ST SUBMITTAL	11-11-19
2ND SUBMITTAL	6-01-20
3ND SUBMITTAL	2-10-23

SHEET 1 OF 1

SAVE DATE: 2/2/2023 ~ PLOT DATE: 2/3/2023 ~ FILE NAME: N:\HWL\0000 Paradise Valley\DRAWING\DISCRETIONARY PLANS\PRELIMINARY GRADING PLAN\Paradise Valley - PGP.dwg

LOW FLOW PUMP

MYERS® DS SERIES

The Myers DS series pumps are designed for basement sumps, but are also ideal for dewatering duties in a variety of applications. This versatile pump features stainless steel construction for extreme resistance to corrosive environments and will provide years of superior service.

APPLICATIONS

Basement sumps, dewatering, utility

SPECIFICATIONS

Capacities – 45 GPM (170.3 LPM)
Shut-off Head – 26' (98.4 m)
Operation – On: 13.5" (342.9 mm)
Off: 6.75" (171.5 mm)
Solids Handling – 3/4" (19 mm)
Liquids Handling – Drain water
Continuous Liquid Temperature – 104°F (40°C)
Motor/Electrical Data – 1/3 HP, 2.7A; 1/2 HP, 4.8A; 3/4 HP, 6.4A; 115V; 60Hz, permanent split capacitor type, 3450 RPM
Acceptable pH Range – 5-9
Shaft Seal – Dual lip with ceramic shaft seal
Housing – Stainless steel
Power Cord – 15', SJTW, 18/3
Discharge, NPT – 1-1/4"
Min. Sump Diameter – 14"

FEATURES

Versatile Performer
Ideal for dewatering in construction sites, ponds, pits, tanks and water extraction from foundations and flooded basements

Stainless Steel Tough
Stainless steel housing and volute case resist corrosion and withstand the harshest conditions

Powerful Start-ups
High-torque, permanent split capacitor (PSC) motor; no relays or starting switches to wear out

Runs Cooler
Rugged, oil-filled motor for continuous bearing lubrication and maximum heat dissipation

Double-protected Motor
Long-life carbon/ceramic seal and additional lip seal protect motor against water leakage

Extended Service
Fully lubricated bearings and shaft seal for longer service life

Smooth Operation
Impeller is designed for clog resistance and effectively handles solids up to 3/4" in diameter

Fittings Included
1-1/4" NPT x 1-1/4" NPT 90° discharge elbow, 1-1/4" NPT x 1-1/2" adapter

ORDERING INFORMATION

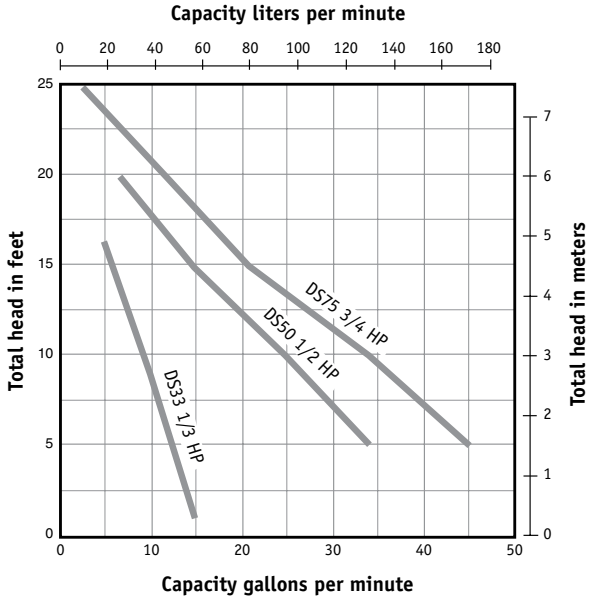
Catalog Number	HP	Volts	Phase/ Cycles	Amps	Discharge Size	Switch Type	Cord Length	Approx. Wt. Lbs.
DS33P1	1/3	115	1/60	2.7	1-1/4"	Tethered Automatic*	15'	13
DS50P1	1/2	115	1/60	4.8	1-1/4"	Tethered Automatic*	15'	16
DS75P1	3/4	115	1/60	6.4	1-1/4"	Tethered Automatic*	15'	19

*Piggyback

LOW FLOW PUMP

MYERS® DS SERIES

PUMP PERFORMANCE



H = 10'
DS 33 with 1 1/4" outflow pipe

==> 0.9 gpm

= 0.024 cfs

PENTAIR

USA
293 WRIGHT STREET, DELAVAN, WI 53115 WWW.FEMYERS.COM
PH: 888-987-8677 ORDERS FAX: 800-426-9446

CANADA
490 PINEBUSH ROAD, UNIT 4, CAMBRIDGE, ONTARIO N1T 0A5
PH: 800-363-7867 ORDERS FAX: 888-606-5484

Customer Technical Offer

Customer	Barrett Engineered Pumps	Size / Stages	Hydromatic - S4L / 1
Item Number / Tags	621gpm @ 14'	Pump speed	1165 rpm
Customer reference		Quote number	MT2022-11-30

Pump

Qty	Description
1	*Hydromatic - S4L*

Pump Information

Motor

Replacement Pump: Please select - 1.38 cfs

Environment: Ordinary

Impeller Diameter Selection Criteria: Impeller diameter calculated from 621 USgpm and 14 Ft

Rated Flow: 621 USgpm

Rated Head: 14 Ft

Impeller Trim: 9.3750 inches - based on curve data

Selected Hertz: 60

Speed Rated: 1165 RPM

Motor size: 7.50 hp / 5.59 kW

Seal Type: Dual

Motor voltage / phase: Please select voltage/phase

Oil type: Dielectric transformer

Wet end and seal options

Pump: S4L750M6-6, Solids handling pumps 7.5 HP 200 volt 3 phase Horizontal orientation with Flanged discharge connection

Horizontal or vertical discharge: Horizontal discharge

Flanged or threaded connection: Flanged discharge

Single / Dual seal options: Dual Mechanical seal

Impeller Material: Special [Enter Specifics]

Impeller Wear Ring: None

Upper seal material - elastomer: Carbon ceramic - Nitrile

Lower seal material - elastomer: Carbon ceramic - Nitrile

Volute material: Cast iron

Volute Wear Ring: Bronze volute wear ring

Other available pump options

O-Ring and gasket material: Nitrile

Cord length and gauge: Standard 8-4 Cord, 35 ft

Pump coatings: Green air dry enamel

Dual Pump
= 1.38 x 2
= 2.76 cfs

System

Qty	Description
1	

Pump Information

Wet well configuration

Rail system: None

Weight

Qty	Description
1	

Pump Information

Weight

Approximate weight for quantity shown

Pump Weight: 650 lb (294.84 kg)

Total Weight: 650 lb (294.84 kg)

Item Number / Tags	: 621gpm @ 14'	Size	: Hydromatic - S4L
Service	: Q100 Pumps	Stages	: 1
Quantity	: 1	Based on curve number	: SUB_S_E_AH_00009_E_6 Rev 2012-03-23
Quote number	: MT2022-11-30	Date last saved	: 30 Nov 2022 4:50 PM

Operating Conditions

Flow, rated	: 621.0 USgpm
Differential head / pressure, rated (requested)	: 14.00 ft
Differential head / pressure, rated (actual)	: 14.16 ft
Suction pressure, rated / max	: 0.00 / 0.00 psi.g
NPSH available, rated	: Ample
Site Supply Frequency	: 60 Hz

Performance

Speed criteria	: Synchronous
Speed, rated	: 1165 rpm
Impeller diameter, rated	: 9.38 in
Impeller diameter, maximum	: 11.88 in
Impeller diameter, minimum	: 8.88 in
Efficiency	: 43.53 %
NPSH required / margin required	: - / 0.00 ft
nq (imp. eye flow) / S (imp. eye flow)	: 35 / - Metric units
Minimum Continuous Stable Flow	: 104.5 USgpm
Head, maximum, rated diameter	: 36.67 ft
Head rise to shutoff	: 161.88 %
Flow, best eff. point	: 438.4 USgpm
Flow ratio, rated / BEP	: 141.66 %
Diameter ratio (rated / max)	: 78.91 %
Head ratio (rated dia / max dia)	: 26.27 %
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Selection status	: Acceptable

Liquid

Liquid type	: Water
Additional liquid description	:
Solids diameter, max	: 0.00 in
Solids diameter limit	: 3.25 in
Solids concentration, by volume	: 0.00 %
Temperature, max	: 68.00 deg F
Fluid density, rated / max	: 1.000 / 1.000 SG
Viscosity, rated	: 1.00 cP
Vapor pressure, rated	: 0.34 psi.a

Material

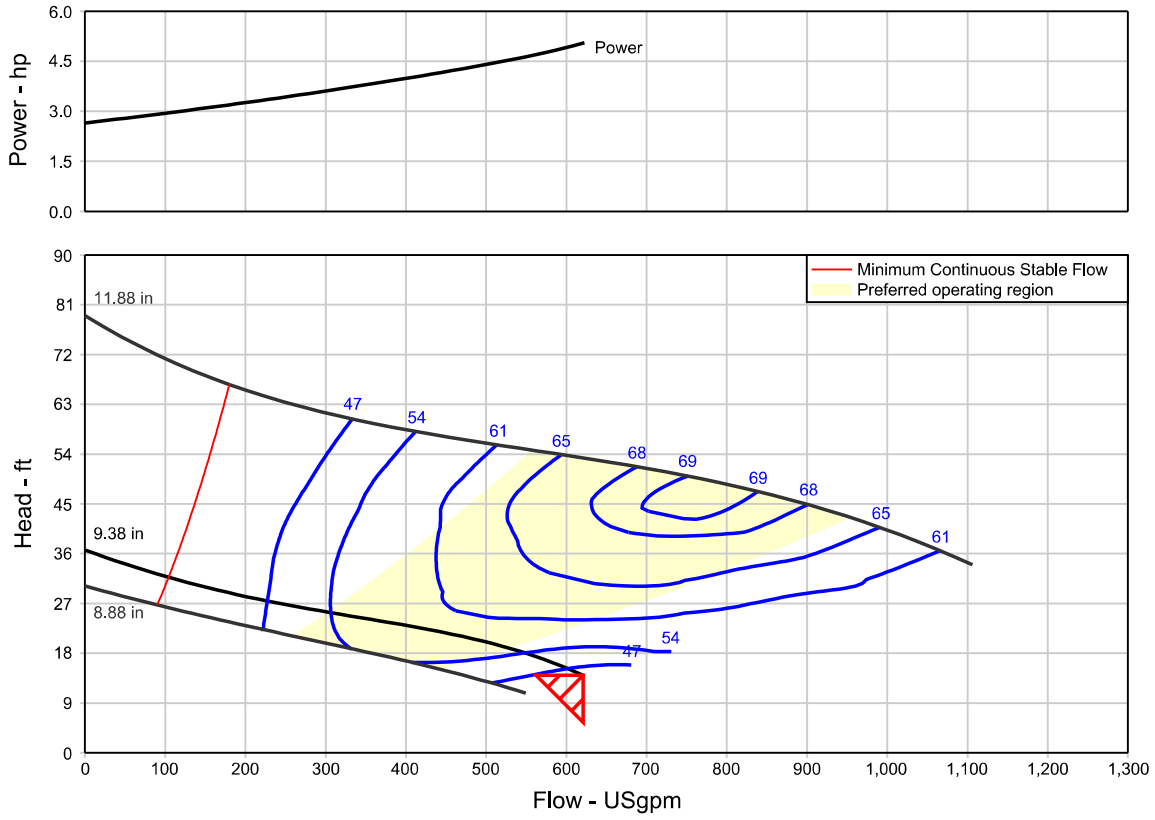
Material selected	: Standard

Pressure Data

Maximum working pressure	: 15.87 psi.g
Maximum allowable working pressure	: N/A
Maximum allowable suction pressure	: N/A
Hydrostatic test pressure	: N/A

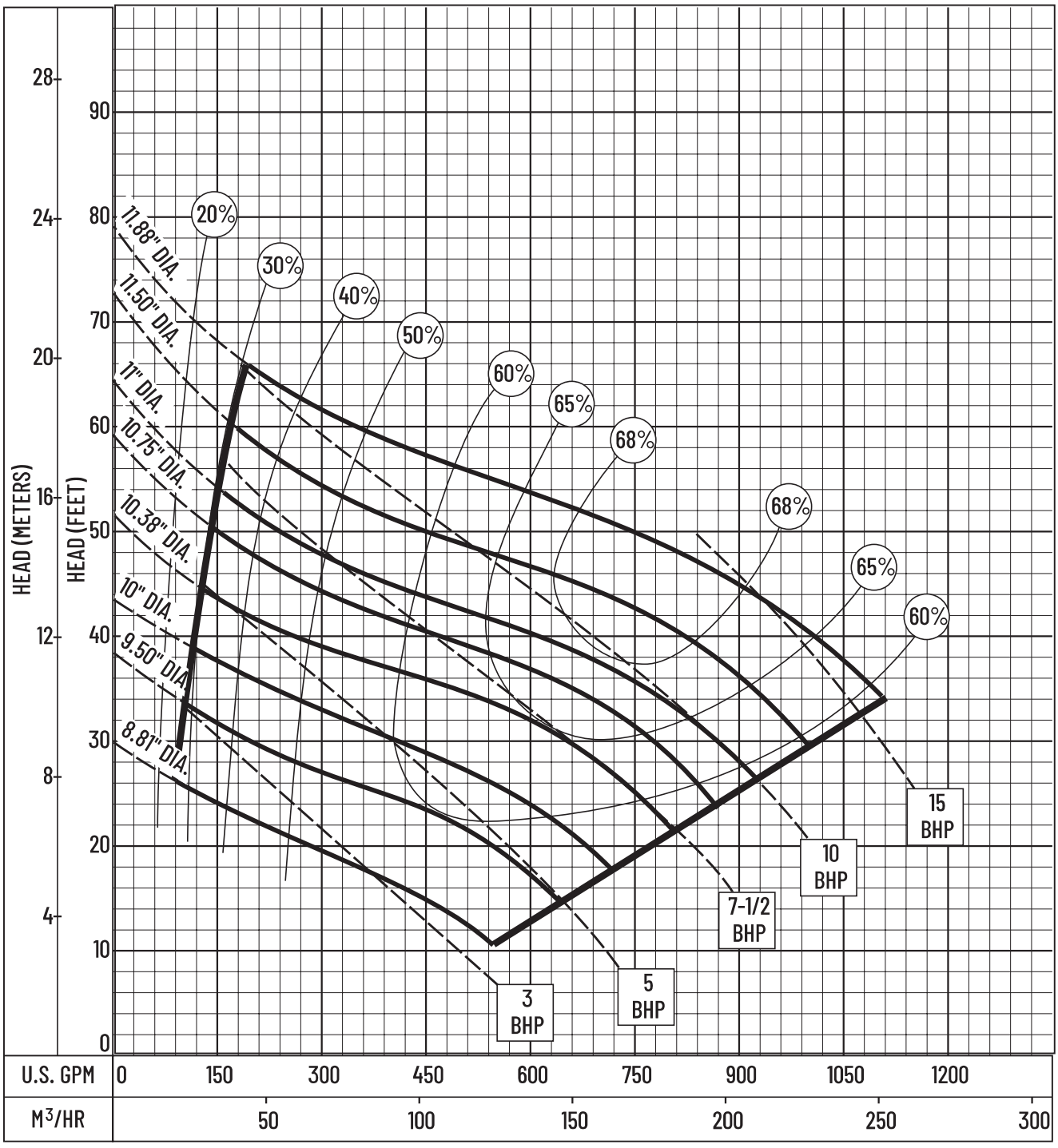
Driver & Power Data (@Max density)

Driver sizing specification	: Rated power
Margin over specification	: 0.00 %
Service factor	: 1.00
Power, hydraulic	: 2.20 hp
Power, rated	: 5.04 hp
Power, maximum, rated diameter	: 5.05 hp
Minimum recommended motor rating	: 7.50 hp / 5.59 kW



Performance Curve – S4L/S4LX

RPM: **1150** DISCHARGE: **4"** SOLIDS: **3-1/4"**

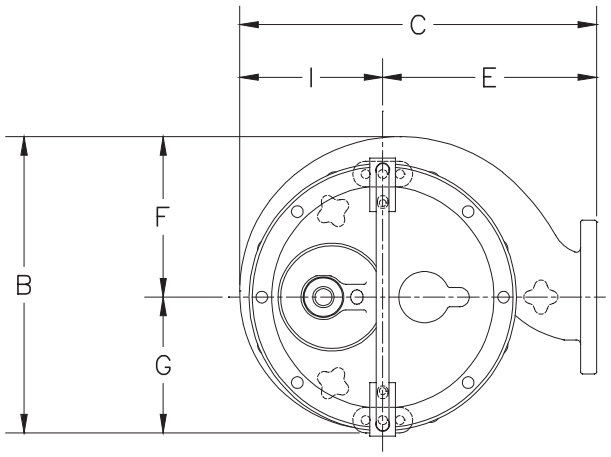


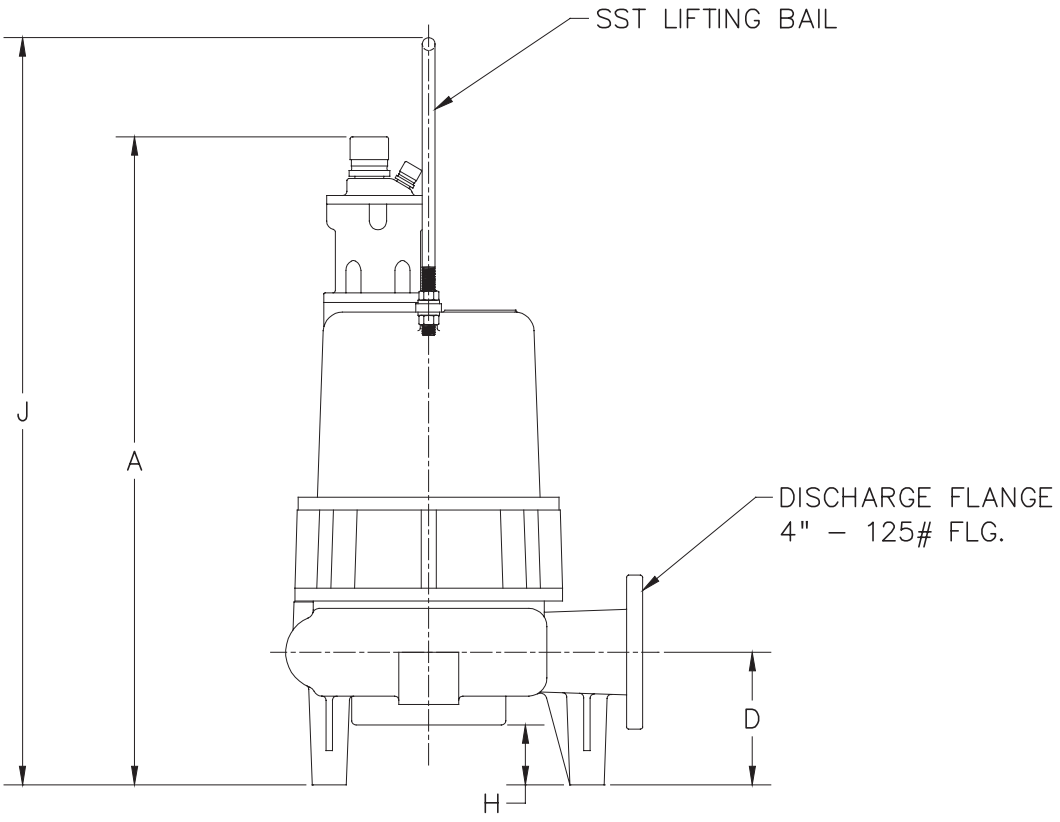
The curves reflect maximum performance characteristics without exceeding full load (Nameplate) horsepower. All pumps have a service factor of 1.2. Operation is recommended in the bounded area with operational point within the curve limit.
Performance curves are based on actual tests with clear water at 70° F. and 1280 feet site elevation.

Conditions of Service:

GPM: _____ TDH:_____

Dimensional Data – S4L/S4LX





	A	B	C	D	E	F	G	H	I	J
S4L150–2000	37–7/8	17–7/16	21–1/4	7–3/4	12–1/2	9–9/16	7–7/8	3–5/16	8–3/4	43–5/8
S4L2500–5000	42–5/8	17–7/16	21–1/4	7–3/4	12–1/2	9–9/16	7–7/8	3–5/16	8–3/4	48–1/2
S4LX	42–5/8	17–7/16	21–1/4	7–3/4	12–1/2	9–9/16	7–7/8	3–5/16	8–3/4	48–1/2

ALL DIMENSIONS IN INCHES
NOTE: CASTING DIMENSIONS MAY VARY ± 1/8"

Electrical Data – S4L/S4LX

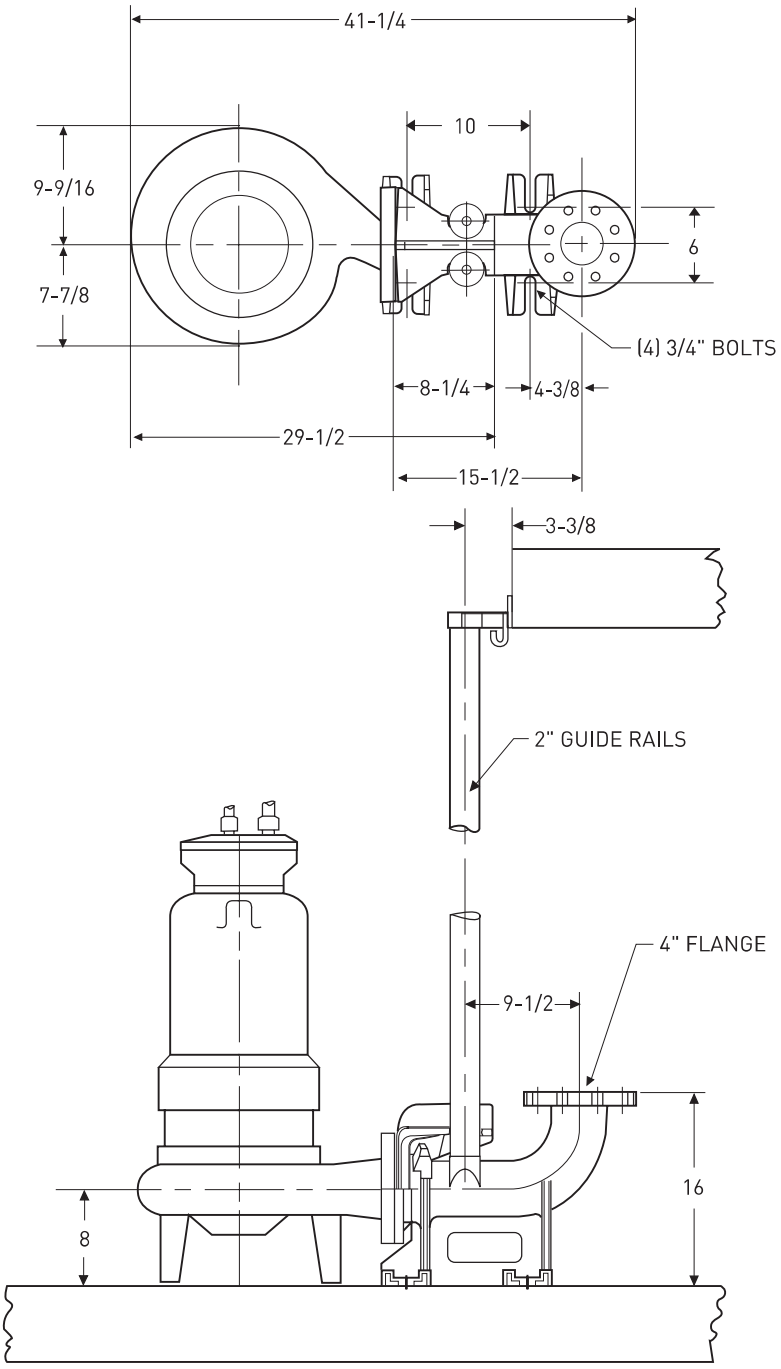
MODEL: S4L & S4LX—Solids Handling Sewage Pump

R.P.M.	1150			
MOTOR TYPE	ENCLOSED, OIL COOLED INDUCTION, VFD SUITABLE			
MOTOR DESIGN NEMA TYPE	B (3ø)			
GENERAL INSULATION CLASS	H			
STATOR WINDING CLASS	H			
MAXIMUM STATOR TEMPERATURE	356°F (180°C)			
MOTOR PROTECTION	BI-METALLIC, TEMPERATURE SENSITIVE DISC, SIZED TO OPEN AT 130°C AND AUTOMATICALLY RESET @ 96–68°C DIFFERENTIAL, ONE IN SINGLE PHASE, TWO IN THREE PHASE			
ELECTRICAL RATINGS	HEAT SENSOR	24VDC 5AMPS	115VAC 5AMPS	230VAC 5AMPS
	SEAL FAIL	300VAC 5mA		
VOLTAGE TOLERANCE	±10%			

HP	VOLTAGE	PHASE	NEC CODE	SF	FULL LOAD AMPS	SF AMPS	LCKD. RTR. AMPS	RUN KW	START KVA	RUN KVA	MTR. EFF. @ SF	MTR. EFF. 100% FL	MTR. EFF. 75% FL	MTR. EFF. 50% FL	PWR. FACT. @ SF	PWR. FACT. 100% FL	PWR. FACT. 75% FL	PWR. FACT. 50% FL
3	200	3	K	1.2	13.3	15.6	106	3.4	36.7	4.6	.69	.66	.60	.51	.72	.74	.63	.55
	230				11.6	13.6	92											
	460				5.8	6.8	46											
	575				4.6	5.4	36.8											
5	200	3	J	1.2	19.4	23.9	106	5.1	36.7	6.8	.75	.73	.70	.62	.73	.76	.73	.66
	230				16.9	20.8	92											
	460				8.4	10.4	46											
	575				6.8	8.3	36.8											
7½	200	3	K	1.2	28.8	32.7	186	7.1	64.5	10.0	.80	.79	.75	.69	.74	.71	.66	.57
	230				25	28.5	162											
	460				12.5	14.2	81											
	575				10	11.4	65											
10	200	3	H	1.2	35.7	42	186	9.3	64.5	12.3	.80	.81	.79	.74	.77	.75	.71	.63
	230				31	36.5	162											
	460				15.5	18.2	81											
	575				12.4	14.6	65											
15	200	3	G	1.2	48.1	56.6	267	13.3	92.5	16.6	.84	.84	.84	.80	.82	.80	.78	.70
	230				41.8	49.2	232											
	460				20.9	24.6	116											
	575				16.7	19.7	92.8											

Installation Data – MTM

S4L/S4LX(P)



ALL DIMENSIONS IN INCHES.
NOTE: CASTING DIMENSIONS MAY VARY ± 1/8"

331 PUMP CONTROL PANEL

THREE PHASE DUPLEX APPLICATIONS

OVERVIEW

The 331 Control Panel is designed for three phase duplex pump applications (three voltages 208/240/480 VAC, one panel). The panel utilizes the robust DPC-4F controller which provides the pump control ON & OFF sequence, pump alternation selection, lag pump delay time, and highwater alarm and float out-of-sequence alarm conditions. Models available with intrinsically safe relay for circuit extension into hazardous locations.

MODELS AVAILABLE

- **1061040 331SS** Stainless Steel Wall Mount NEMA 4X Enclosure
- **1061041 331FG** Fiberglass Wall Mount NEMA 4X Enclosure
- **1059965 331SS-IS** Stainless Steel Wall Mount NEMA 4X Enclosure Intrinsically Safe
- **1059966 331FG-IS** Fiberglass Wall Mount NEMA 4X Enclosure Intrinsically Safe

**Overload modules sold separately based on motor FLA, order quantity 2.*

OPTIONS (Customer Installed)

- **1033805** (1.25-5.0) FLA Overload Module
- **1023500** (4.5-18.0) FLA Overload Module
- **1033806** (8.0-32.0) FLA Overload Module
- **1036351** Surge arrestor and bracket
- **1027807** Pedestal painted steel
- **1027824** Pedestal stainless steel
- **1025530** Pedestal fiberglass

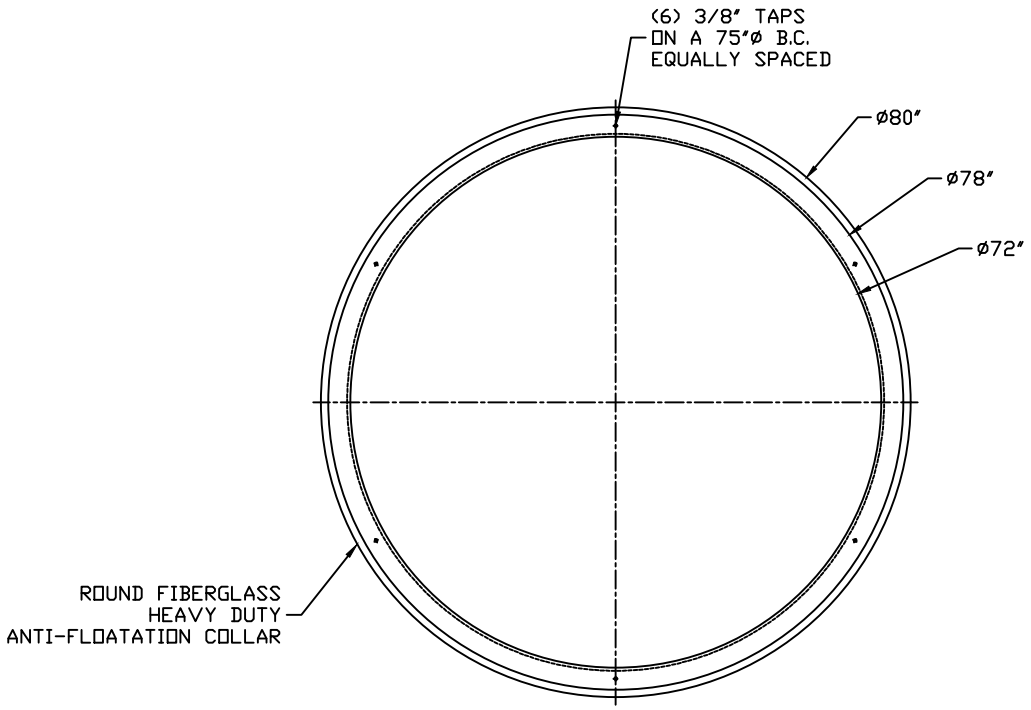
SPECIFICATIONS

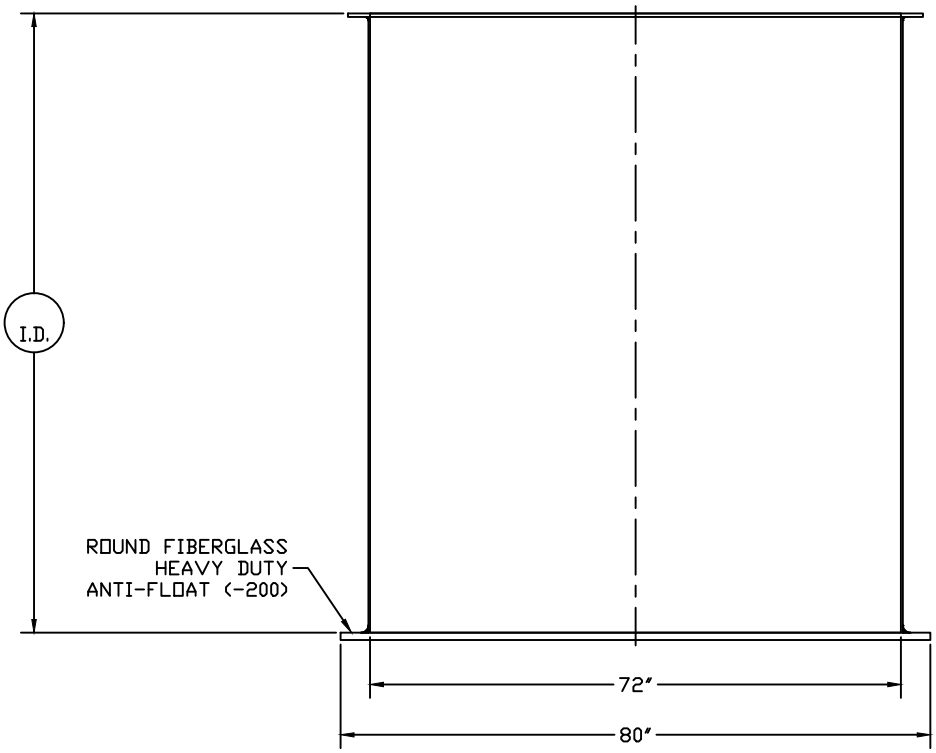
- Padlockable wall mount NEMA 4X
- White painted steel inner door and backplate
- Single-point power connection
- IEC HP rated motor starter with adjustable class 10 ambient compensated overloads
- 10 HP max @208VAC, 240VAC
- 20 HP max @480VAC
- Pump short circuit disconnect/overload reset through inner door
- Overtemp shutdown for motor winding switches (auto reset)
- DPC-4F controller
  - Pump sequence control
  - Pump selector switch (Alt, 1-2, 2-1)
  - Pump lag delay time adjustable (0-60 sec)
  - High water alarm
  - Float out of sequence alarm and float reassignment during event
  - Pump call (green), control power (green), float status (amber) and alarm (red) LED indicators
- Tri-voltage stepdown control transformer
- Dual Seal Fail module, adjustable 1kΩ-250kΩ with red LED indicators
- Red flashing alarm beacon and audible horn
- Alarm silence and push-to-test 22mm
- Hand-Off-Auto selector switches 22mm
- Pump Run (green) LED indicators 22 mm
- Elapse time meters
- Auxiliary contacts
- 4-channel intrinsically safe relay (I.S. models only)

PRIMEX
WATER SYSTEM INTEGRATOR AND CONTROLS PROVIDER
844-4PRIMEX (477-4639)
WWW.PRIMEXCONTROLS.COM

9500261B 10/18

PART/PRINT #:	PART DESCRIPTION:	DATE:
GB-72-200	72"ø FIBERGLASS BASIN W/ ROUND HEAVY DUTY ANTI-FLOATATION COLLAR	05/25/16

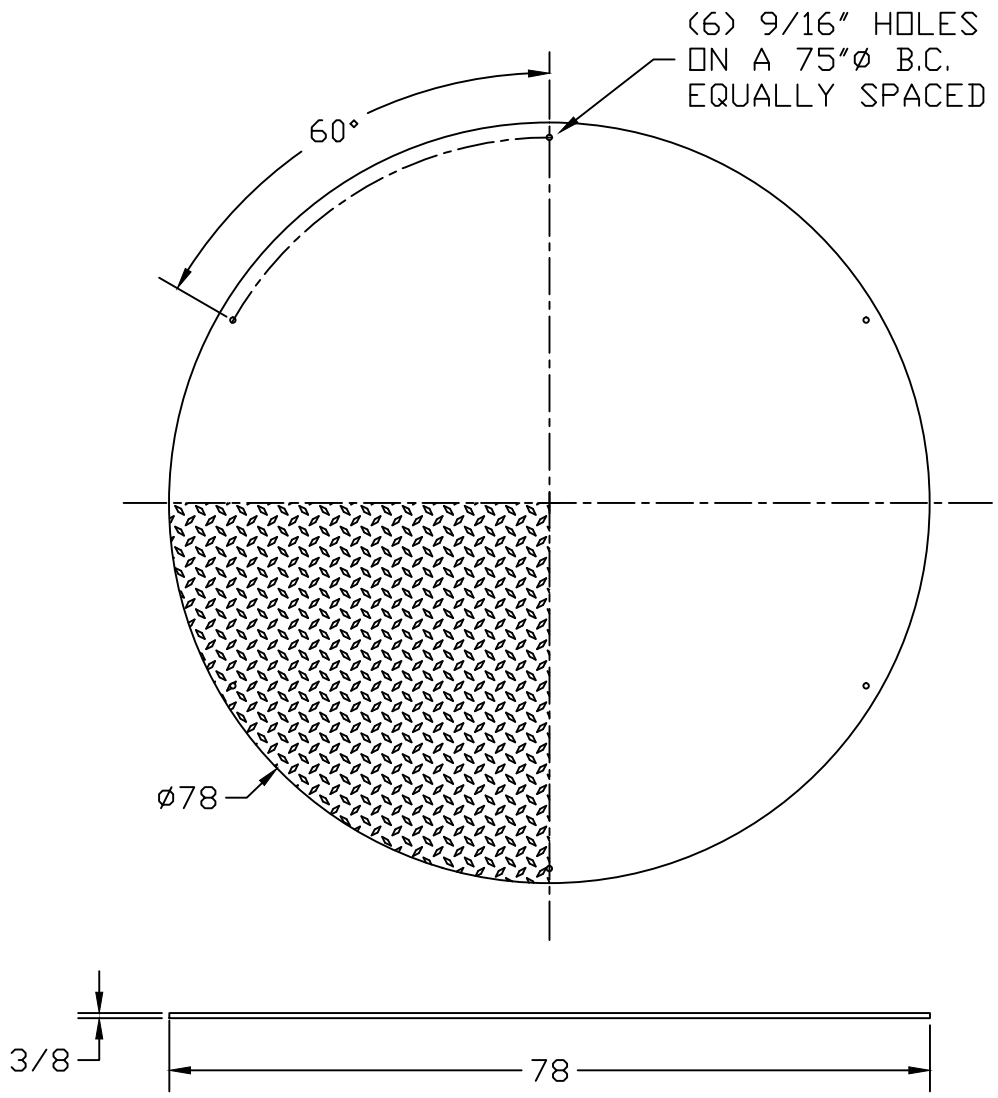




AK INDUSTRIES INC.
2055 PIDCO DR.
PLYMOUTH, IN. 46563
PHONE:(574) 936-6022

DRAWN BY:	SCALE:	REVISION#:	SIGNATURE:
A.HARTUNG J.CONLEY	NOT TO SCALE		

PART/PRINT NO.	PART DESCRIPTION	DATE
GL-7200	ROUND FIBERGLASS SOLID COVER	04/04/07



	DRAWN BY:	SCALE:	REVISION #:	SIGNATURE:
AK INDUSTRIES INC. 2055 PIDCO DR. PLYMOUTH, IN. 46563 PHONE:(574) 936-6022	J.CONLEY	NOT TO SCALE		

ATTACHMENT
Source Control BMP Worksheet

3.0 Cover Sheet and General Requirements

- Standard SWQMP Form Table 2 and PDP SWQMP Form Table 3 require the identification of pollutant-generating sources and associated BMPs for development projects.

- In some cases, County staff may request additional, more detailed documentation of source control BMP design details. If requested, applicants must submit a completed copy of this Source Control BMP Worksheet. This requirement can be satisfied either by submitting a copy of BMPDM Attachment E.1 (Source Control BMP Requirements) or equivalent documentation at the County's discretion.

- Submit this documentation using this cover sheet.

- Sources and BMPs must also be shown as applicable on DMA exhibits and construction plans (see Attachment 2).

E.1 Fact Sheet Quick Guide

BF-1 Biofiltration (1)

Location: Elkelton blvd. and Paradise Valley rd, Springvalley, California (3)

MS4 Permit Category (2)
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control ,
Q100 mitigation

Primary Benefits
Treatment

Description (4)

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system.

Fact Sheet Key	
1	Best Management Practice (BMP) Title
2	Categories, Standards, and Benefits
3	BMP Image
4	Main Content; Categories Include: •Description •Design Adaptations for Project Goals •Recommended Siting Criteria •Recommended BMP Component Dimensions •Design Criteria and Considerations •Conceptual Design and Sizing Approach for o Site Design o Storm Water Pollutant Control Only o Integrated Storm Water Pollutant Control and Flow Control •Maintenance Overview •Summary of Standard Inspection and Maintenance

E.2 Source Control BMP Requirements

Worksheet E.1-1: Source Control BMP Requirements

How to comply: Projects must comply with this requirement by implementing all source control BMPs listed in this section that are applicable and feasible for their project. Applicability must be determined through consideration of the development project's features and anticipated pollutant sources. Appendix E.2 provides guidance for identifying source control BMPs applicable to a project. The Standard and PDP SWQMP templates include sections that must be used to document compliance with source control BMP requirements.

How to use this worksheet:

1. Review Column 1 and identify which of these potential sources of storm water pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your project site plan.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your project-specific storm water management report. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

If These Sources Will Be on the Project Site …	… Then Your SWQMP Must Consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
☒ **A.** Onsite storm drain inlets ☐ Not Applicable	☒ Locations of inlets.	☒ Mark all inlets with the words "No Dumping! Flows to Bay" or similar. See stencil template provided in Appendix I-4	☒ Maintain and periodically repaint or replace inlet markings. ☒ Provide storm water pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks ☒ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **B.** Interior floor drains and elevator shaft sump pumps ☒ Not Applicable		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages ☒ Not Applicable		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D1.** Need for future indoor & structural pest control ☒ Not Applicable		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
☒ **D2.** Landscape/ Outdoor Pesticide Use ☐ Not Applicable	☐ Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☒ Show storm water treatment facilities.	State that final landscape plans will accomplish all of the following. ☐ Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. ☒ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution. ☐ Where landscaped areas are used to retain or detain storm water, specify plants that are tolerant of periodic saturated soil conditions. ☒ Consider using pest-resistant plants, especially adjacent to hardscape. ☒ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use,	☒ Maintain landscaping using minimum or no pesticides. ☐ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks ☒ Provide IPM information to new owners, lessees and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features. ☒ Not Applicable	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks
☒ **F.** Food service ❑ Not Applicable	☒ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☒ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
☒ **G.** Refuse areas ☐ Not Applicable	☐ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☒ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. Also show how the designated area will be protected from wind dispersal. ☐ Any drains from dumpsters, compactors, and tallow bin areas must be connected to a grease removal device before discharge to sanitary sewer.	☐ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☒ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☒ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on- site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative Table and Narrative**
❑ **H.** Industrial processes. ☒ Not Applicable	❑ Show process area.	❑ If industrial processes are to be located onsite, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Storm Water Discharges" in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) ☒ Not Applicable	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or runoff from area and protected from wind dispersal. ❑ Storage of non-hazardous liquids must be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release Prevention Program ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
☒ **J.** Vehicle and Equipment Cleaning ☐ Not Applicable	☒ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs must either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes must have a paved, bermed, and covered car wash area (unless car washing is prohibited onsite and hoses are provided with an automatic shut- off to discourage such use). (3) Washing areas for cars, vehicles, and equipment must be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities must be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility must discharge to the sanitary sewer, or a wastewater reclamation system must be installed.	☐ If a car wash area is not provided, describe measures taken to discourage onsite car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ☒ Washwater from vehicle and equipment washing operations must not be discharged to the storm drain system. ☐ Car dealerships and similar may rinse cars with water only. ☒ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **K.** Vehicle/Equipment Repair and Maintenance ☒ Not Applicable	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to protect from rainfall, run-on runoff, and wind dispersal. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains must not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the report, note that all of the following restrictions apply to use the site: ❑ No person must dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal must be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids must be contained or drained from the vehicle immediately. ❑ No person must leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
☒ **L.** Fuel Dispensing Areas ☐ Not Applicable	☒ Fueling areas[2] must have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are (1) graded at the minimum slope necessary to prevent ponding; and (2) separated from the rest of the site by a grade break that prevents run-on of storm water to the MEP. ☒ Fueling areas must be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] must not drain onto the fueling area.		☒ The property owner must dry sweep the fueling area routinely. ☒ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks

[2] The fueling area must be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
M. Loading Docks ☒ Not Applicable	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks must be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts must be positioned to direct storm water away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer must be equipped with a spill control valve or equivalent device, which must be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **N.** Fire Sprinkler Test Water ☒ Not Applicable		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks
O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim ☒ Not Applicable		❑ Boiler drain lines must be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop mounted equipment with potential to produce pollutants must be roofed and/or have secondary containment. ❑ Any drainage sumps onsite must feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
☒ **P.** Plazas, sidewalks, and parking lots. ☐ Not Applicable			☒ Plazas, sidewalks, and parking lots must be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing must be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser must be collected and discharged to the sanitary sewer and not discharged to a storm drain.

E.8 SD-B Impervious Area Dispersion (Dispersion Areas)

Photo Credit: Orange County Technical Guidance Document

MS4 Permit Category

Site Design

Retention

Manual Category

Site Design
Infiltration

Applicable Performance Criteria

Site Design
Pollutant Control
Flow Control

Primary Benefits

Volume Reduction
Peak Flow Attenuation

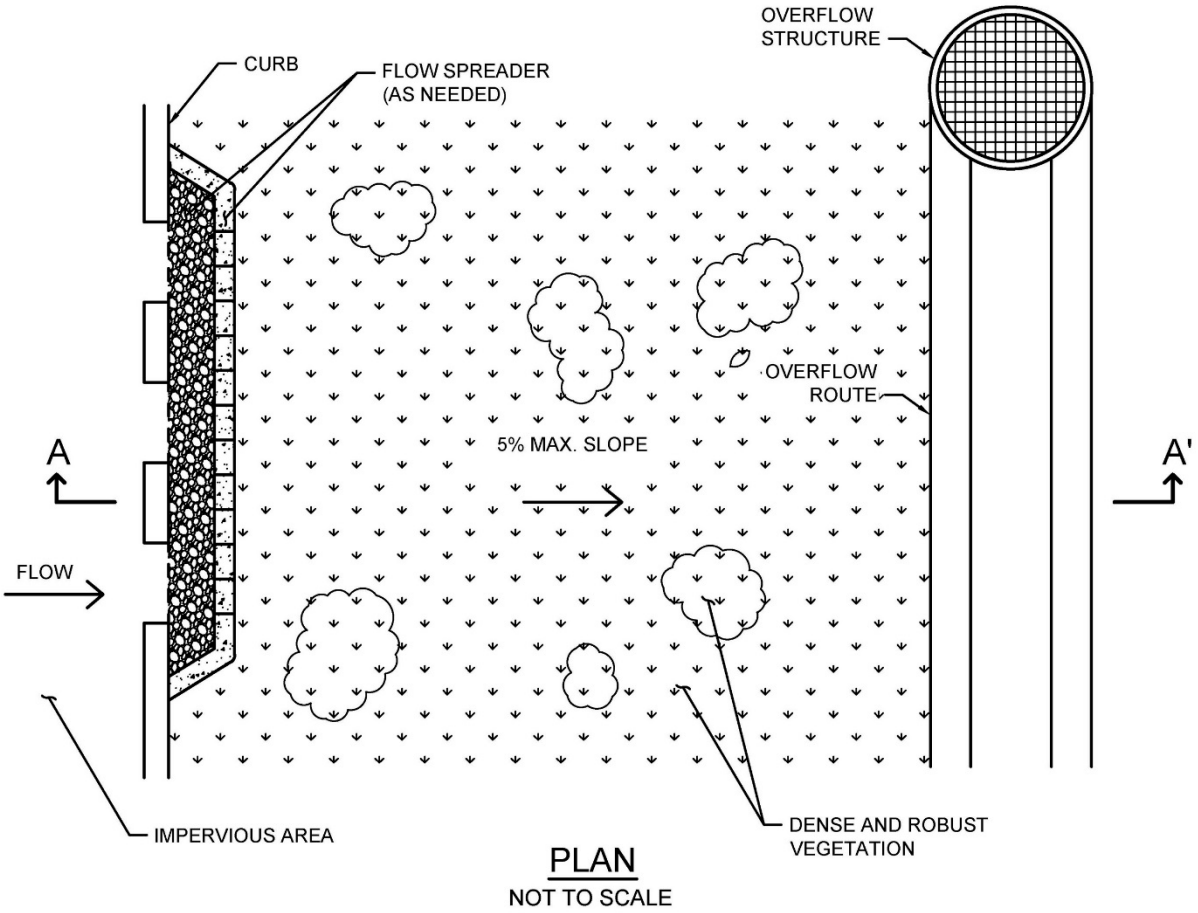
Description

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.

Typical dispersion components include:

- An impervious surface from which runoff flows will be routed with minimal piping to limit concentrated inflows
- Splash blocks, flow spreaders, or other means of dispersing concentrated flows and providing energy dissipation as needed
- Dedicated pervious area, typically vegetated, with in-situ soil infiltration capacity for partial or full infiltration
- Optional soil amendments to improve vegetation support, maintain infiltration rates and enhance treatment of routed flows
- Overflow route for excess flows to be conveyed from dispersion area to the storm drain

system or discharge point



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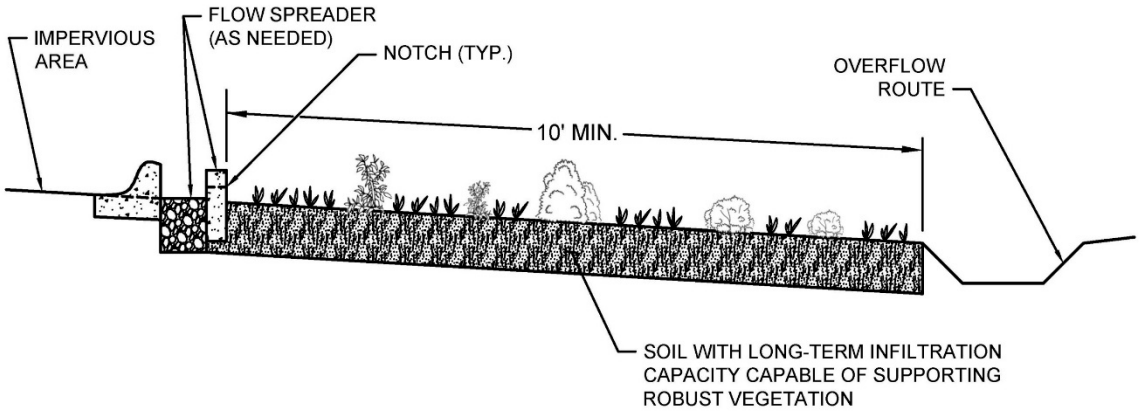

SECTION A-A'
NOT TO SCALE

Typical plan and section view of an Impervious Area Dispersion BMP

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. Impervious area dispersion primarily functions as a site design BMP for reducing the effective imperviousness of a site by providing partial or full infiltration of the flows that are routed to pervious dispersion areas and otherwise slowing down excess flows that eventually reach the storm drain system. This can significantly reduce the DCV for the site.

Design Criteria and Considerations

Dispersion must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of County Staff if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	**Impervious area dispersion Placement:** ensure area is graded; and located so that full DCV water drains to the area of dispersion	Minimizes short-circuiting of run off
☐	Dispersion is over areas with soil types capable of supporting or being amended (e.g., with sand or compost) to support vegetation. Media amendments must be tested to verify that they are not a source of pollutants.	Soil must have long-term infiltration capacity for partial or full infiltration and be able to support vegetation to provide runoff treatment. Amendments to improve plant growth must not have negative impact on water quality.
☐	Dispersion has vegetated sheet flow over a relatively large distance (minimum 10 feet) from inflow to overflow route.	Full or partial infiltration requires relatively large areas to be effective depending on the permeability of the underlying soils.
☐	Pervious areas should be flat (with less than 5% slopes) and vegetated.	Flat slopes facilitate sheet flows and minimize velocities, thereby improving treatment and reducing the likelihood of erosion.
Inflow velocities		
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
Dedication		

Siting and Design		*Intent/Rationale*
☐	Dispersion areas must be owned by the project owner and be dedicated for the purposes of dispersion to the exclusion of other future uses that might reduce the effectiveness of the dispersion area.	Dedicated dispersion areas prevent future conversion to alternate uses and facilitate continued full and partial infiltration benefits.
Vegetation		
☐	Dispersion typically requires dense and robust vegetation for proper function. Drought tolerant species should be selected to minimize irrigation needs. A plant list to aid in selection can be found in Appendix F.	Vegetation improves resistance to erosion and aids in runoff treatment.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where dispersion can be used in the site design to reduce the DCV for pollutant control sizing.
2. Calculate the DCV for storm water pollutant control per Appendix B.2, taking into account reduced runoff from dispersion.
3. Determine if a DMA is considered "Self-retaining" if the impervious to pervious ratio is:
    a. 2:1 when the pervious area is composed of Hydrologic Soil Group A
    b. 1:1 when the pervious area is composed of Hydrologic Soil Group B

Conceptual Design and Sizing Approach for Storm Water Pollutant Treatment and Flow Control

DMAs using impervious area dispersion are considered to meet both pollutant control and hydromodification flow control requirements if ALL of the following criteria are met:

1. All impervious area within the DMA discharges to the pervious area before the runoff discharges from the DMA.
2. As a minimum, the top 11 inches of the pervious area uses amended soils in accordance with the SD-F fact sheet and the pervious area also meets the requirements for dispersion (e.g. slope, inflow velocities, etc.) in the SD-B fact sheet.
3. The impervious to pervious area ratio is 1:1 or less.

Impervious Area Dispersion designed to meet both pollutant control and flow control requirements are designated as SSD BMPs.

Maintenance Overview

Normal Expected Maintenance. Vegetated area shall be maintained as part of normal landscape

maintenance. Additionally, ensure that storm water runoff can be conveyed into the vegetated area as designed. That is, the mechanism that allows storm water runoff from impervious area to flow into the pervious area (e.g., a curb cut allows runoff from a parking lot to drain onto adjacent landscaping area, or a roof drain outlet is directed to a lawn) shall not be removed, blocked, filled, or otherwise changed in a manner that prevents storm water from draining into the pervious area. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

Non-Standard Maintenance or BMP Failure. Impervious area dispersion is a site design BMP that normally does not require maintenance actions beyond routine landscape maintenance. If changes have been made to the area, such as the vegetated area has been replaced with impervious area, or the mechanism that allows storm water runoff from impervious area to flow into the pervious area has been removed (e.g., roof drains previously directed to vegetated area have been directly connected to the street or storm drain system), the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance will be required to restore drainage into the pervious area as designed. If the pervious area has been removed, contact the County reviewer to determine a solution.

Runoff directed into vegetated areas is expected to be drained within 24-96 hours following a storm event. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging or compaction of the soils. Loosen or replace the soils to restore drainage.

Other Special Considerations. Site design BMPs, such as impervious area dispersion, installed within a new development or redevelopment project are components of an overall storm water management strategy for the project. The presence of site design BMPs within a project is usually a factor in the determination of the amount of runoff to be managed with structural BMPs (i.e., the amount of runoff expected to reach downstream retention or biofiltration basins that process storm water runoff from the project as a whole). When site design BMPs are not maintained or are removed, this can lead to clogging or failure of downstream structural BMPs due to greater delivery of runoff and pollutants than intended for the structural BMP. Therefore, the County reviewer may require confirmation of maintenance of site design BMPs as part of their structural BMP maintenance documentation requirements. Site design BMPs that have been installed as part of the project should not be removed, nor should they be bypassed by re-routing roof drains or re-grading surfaces within the project. If changes are necessary, consult the County reviewer to determine requirements.

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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
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
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.
Standing water in vegetated pervious area 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	Disperse any areas of standing water to nearby landscaping (i.e., spread it out to another portion of the pervious area so it drains into the soil). Make appropriate corrective measures such as adjusting irrigation system, 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	Disperse any areas of standing water to nearby landscaping (i.e., spread it out to another portion of the pervious area so it drains into the soil). Loosen or replace soils to restore drainage (and prevent standing water)	• 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
Entrance / opening to the vegetated pervious area is blocked such that storm water from impervious area will not drain into the pervious area (e.g., a curb cut opening is blocked by debris or a roof drain outlet has been directly connected to the storm drain system)	Make repairs as appropriate to restore drainage into the vegetated pervious area.	• Inspect monthly. • Maintain when needed.

ATTACHMENT 5
Existing 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: PRELIMINARY DRAINAGE REPORT For PARADISE VALLEY ROAD GAS STATION

    Prepared By: Jose L. Sanchez

    Date: May, 2020

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

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

PRELIMINARY DRAINAGE REPORT

For

PARADISE VALLEY ROAD GAS STATION

NORTH EAST CORNER OF PARADISE VALLEY ROAD AND ELKELTON BLVD.
SPRING VALLEY, CA 91977

APN 584-160-52-00

November, 2019
Revised: January, 2023

Mel Landy, PE

PREPARED BY:
Jose Sanchez, Civil Engineer

HOWES | WEILER | LANDY
PLANNING & ENGINEERING

2888 LOKER AVENUE EAST, SUITE 217

CARLSBAD, CA 92010

(760) 929-2288

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Peak flow Attenuation……..4-5
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Hydromodification ……9
Conclusions ……9

Appendix

1 Existing Conditions Calculations - Basin Map

2 Developed Conditions Calculations – Basin Map

3 Modified-Puls Detention Routing

4 Maps and Charts

Introduction

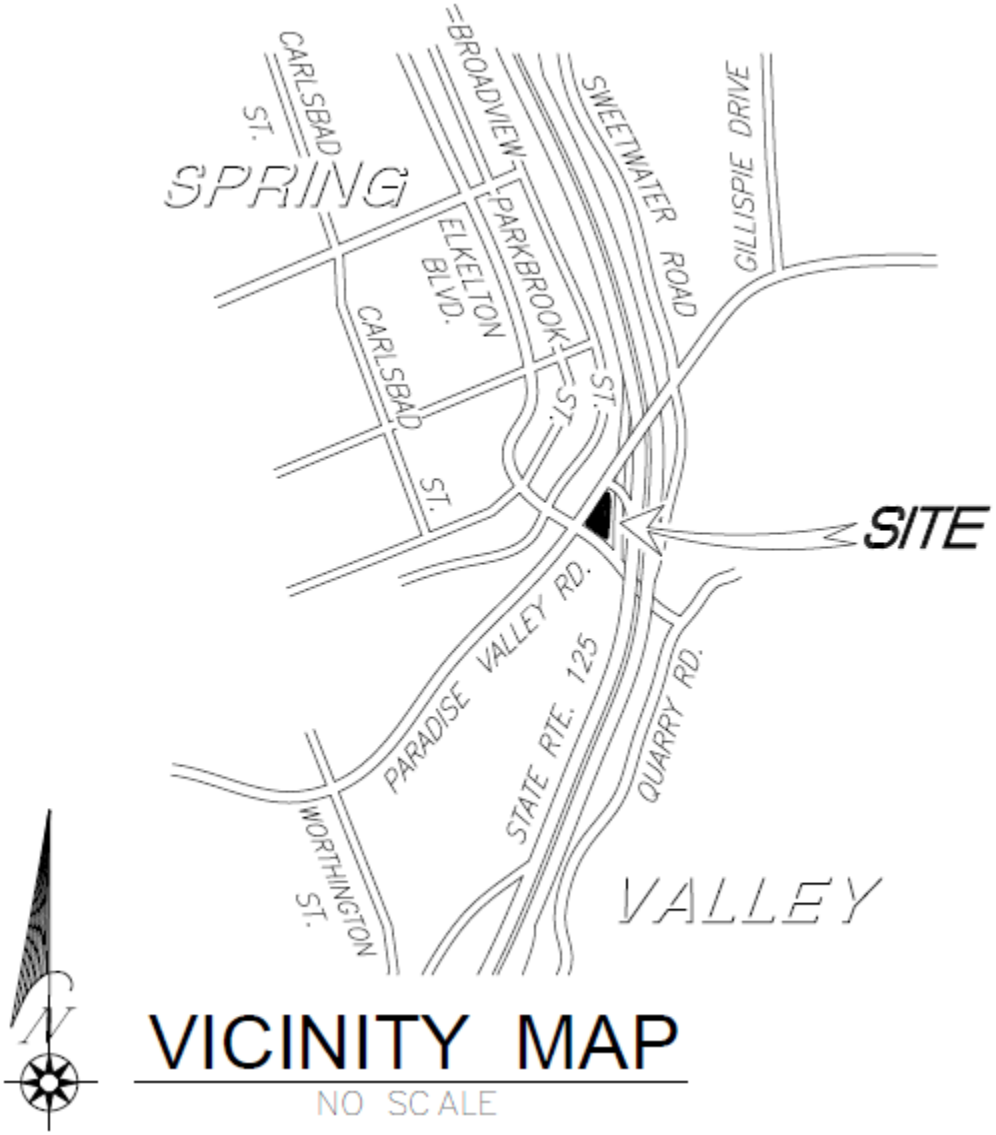
This Drainage Study for the proposed Gas Station development for APN 584-160-52 has been prepared to analyze the hydrologic and hydraulic characteristics of the existing and proposed project site. This report intends to present both the methodology and the calculations used for determining the runoff from the project site in both the pre-developed (existing) conditions and the post-developed (proposed) conditions produced by the 100-year, 6-hour storm. In addition, this report will propose the sizing of all necessary storm drain facilities and storm drain piping to safely convey the runoff, based on the 100-year rainfall event, per County of San Diego Hydrology and Storm Drain Design Standards.

Elevations range for APN 584-160-52 are approximately 287 feet above mean sea level (mls) in the north corner of the site adjacent to Paradise valley road to approximately 283.5 feet, approximately at the midpoint of the south east property line which runs parallel to state route 125.

The project is a proposed gas station, a retail building with parking, carwash and all the necessary utilities. The site is located at the north east corner of Paradise Valle Road and Elkelton Place in Spring Valley. Project site is a triangular shape and is bordered Paradise Valley road on the north, a freeway on ramp on the east and by Elkelton Blvd to the south.

Project site is currently undeveloped, with a driveway access approximately 120 feet north or intersection of Paradise Valley Road and Elkelton Blvd. The site has never been developed and has no impervious surfaces located within the site.

PROJECT VICINITY MAP



Existing Drainage Conditions

Project site is fairly flat terrain with a low point located approximately at the midpoint of the easterly property line, the site has high points located at the north corner of the project site with the terrain sloping in a south east direction towards the low point. The south portion of the site flows on a north easterly direction towards the low point. Flow leaves the site as sheet flow and enter an existing concrete swale, which runs parallel to the easterly property line, once flows enter the concrete swale they are collected by an underground storm drain system which conveys flow under State Route 125 ultimately discharging in a creek located on the east side of state route 125, which flows in a south westerly direction and ultimately connecting to the Sweetwater river, approximately 0.25 miles west of the Sweetwater Reservoir. An existing curb inlet is located approximately 15 feet south of the existing driveway on Paradise Valley Road, flows are capture and immediately conveyed under ground and routed to the same creek located on the east side of State Route 125.

Proposed Drainage Conditions

The project proposes to create new impervious surfaces consistent with a gas station: Rooftop, driveways, gas station canopy, and parking and a carwash. There will be grading activities to level out areas for new improvements, the drainage patterns will be adjusted to allow for surface flows to be collected at the access driveway of the site via a trench drain. The project proposes installation of storm drain structures that will convey flows to the same pre-development discharge point. All generated will sheet flows in a northerly direction and will be collected by a trench drain located along the access driveway to the site. Flows will then be taken via an 8” HDPE storm drain system to proposed bio-filtration facilities for water quality pollution control, hydromodification management and Q_{100} attenuation. Treated flows will then be conveyed via a 12” PVC storm drain to a Pump structure which will ultimately discharge flows through an onsite curb outlet located in a landscape area south of the parking stalls. Flows will eventually leave the site as surface flows before entering an existing Caltrans concrete ditch which is parallel to the southernly property line. Said flows will ultimately comingle with the creek flows located on the east side on State Route 125, and be directed to the Sweetwater River.

Peak flow attenuation

BMP will store and manage the Q_{100} peak flows for flow attenuation to pre-development levels. The basins have a 24”x24” riser box with varying heights which will act as a spillway such that peak flows can be safely discharged to the receiving storm drain system. The development condition Peak flows were calculated using modified rational. The corresponding 6-hr hydrographs were generated using the CivilDesign extension. These

hydrographs were then routed through the proposed-on site detention facilities in the CivilDesign Flood Hydrograph Routing Program, input values were based on Depth vs Storage and Depth vs Discharge data. In order to have a more accurate model the elevation inputs were every 0.10 feet to allow for an increase in the precision of the results, see Appendix 3 for input values. The weirs located on all four sides of the riser box begin 6-inches above the finish grade of the bioretention basin (283.0 FG), therefor any storage volume below the weir was not considered in the model. The results are summarized on table 3 below.

Emergency Weir

This study has performed Spillway calculations for the basin being proposed as part of this project, assuming a complete clogging of the water quality facilities, and with peak flows being conveyed through the overflow system only. After the analysis it has been determined that the basin will not require a secondary emergency box to allow peak flows to be conveyed without having detrimental effect on the basins. The results being presented on Appendix 4, of this report, represent the maximum flow capacity of each box. See table 2 of this report for peak flows.

Study Methodology

The method of analysis was based on the Rational Method according to the San Diego. Runoff calculations for this study were accomplished by using the Rational Method. The Rational Method is a physically-based numerical method where runoff is assumed to be directly proportional to rainfall and area, less losses for infiltration and depression storage.

Flows were computed based on the Rational formula:

$$Q = CIA$$

Where Q = Peak discharge (cfs);
C = runoff coefficient, based on land use and soil type
I = rainfall intensity (in/hr)
A = watershed area (acre)

(1) Runoff Coefficient, C

Table 4-1 lists the estimated coefficients for urban areas.

Table 4-1

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

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

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

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

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

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

DMA #	***a. DMA Area (ft^2)***	***Incidental Impervious Area***		***Permit # and Sheet #***
		b. Size(ft^2)	***c. % (b/a*100)***	
DMA 2	679	0	0	DMA exhibit (attachment 2.1 of this report)
DMA 3	1,816	90	4.95%	DMA exhibit (attachment 2.1 of this report)

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

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

<u>Natural and Landscaped Areas</u>

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

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

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

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

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

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

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

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

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.

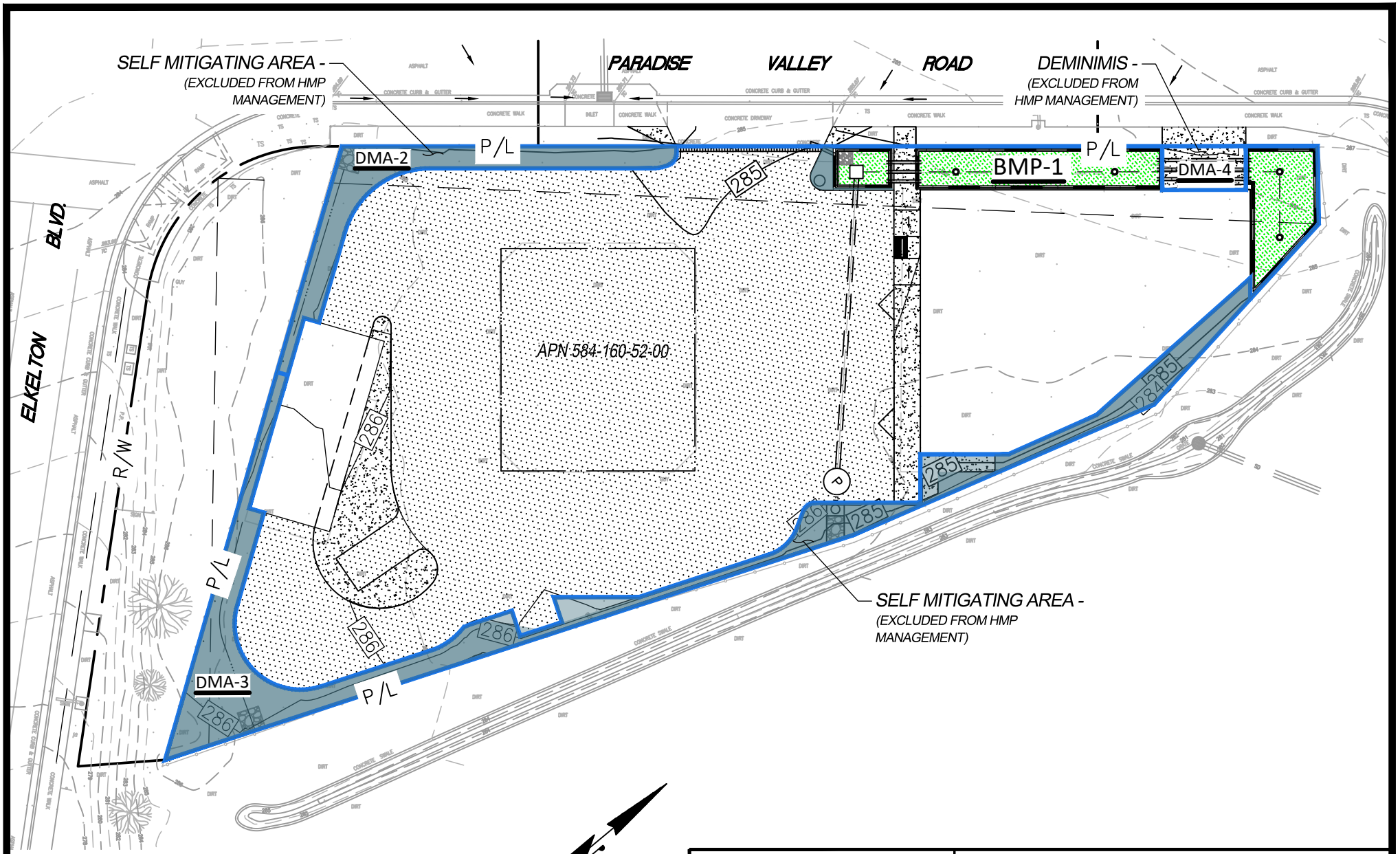
- Provide the information requested below for each proposed de minimis DMA. Add rows or copy the table if additional entries are needed.

DMA #	***DMA Area (ft^2)***	***Permit # and Sheet #***
DMA 4	178	DMA exhibit (attachment 2.1 of this report)

- "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 <u>fully</u> satisfies all design requirements and restrictions described in BMPDM Section 5.2.2 De Minimis DMAs.



SCALE: 1" = 30'

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PARADISE VALLEY GAS STATION
PDS2019-ZAP-19-003,
PDS2020-ER-20-18-001
BMP DETAIL

DATE: 2/10/23

DRAWING:

SHEET 1 OF 1

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 Paradise Valley Gas Station
Permit Application Number PDS2019-ZAP-19-003

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).

Mellor Landy REC NO. 81085 Exp. Date : 09-30-23
Engineer of Work's Signature, PE Number & Expiration Date

Mellor Landy
Print Name

Howes Weiler Landy
Company

Engineer's Seal:

03-29-2022
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 area being disturbed was measured and a DCV was calculated for DMA-1. Harvest and Use was deemed not feasible. Per NRCS Web Soil Survey the site soil is type D which has low infiltration rate. DMA-2 and DMA-3 are self-mitigating area, while DMA-4 is Deminimis.

The project will construct a of biofiltration basin on the north corner of the project site, in proximity to proposed building and existing public sidewalk therefore will required to be lined with impervious liner to prevent any negative effect on the building foundation and sidewalk. Treated flows will then be conveyed via a 12" PVC storm drain to a Pump structure with a low flow pump that has been sized to comply with 0.1Q2 low flow threshold and a high flow pump for the Q100. The pump system will ultimately discharge flows through an onsite curb outlet located in a landscape area south of the parking stalls. Flows will eventually leave the site as surface flows before entering an existing Caltrans concrete ditch which is parallel to the southernly property line. Pollutant and flow control for hydromodification will be implemented in the BMP through the use of soil media and gravel storage layer.

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

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

BMP ID #	DMA #	DMA Area (ft^2)	Structural BMP Type							Permit # and Sheet #
			Harvest and Use	Infiltration	Unlined Biofiltration	Lined Biofiltration	Flow-thru treatment	Hydromodification Management [1]	Other	
BMP 1	DMA		☐	☐	☐	☒	☐	☒	☐	See Preliminary Grading Plan
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
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			☐	☐	☐	☐	☐	☐	☐	

Copy and Paste table here for additional BMPs

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

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

Structural BMP ID # BMP 1	**Permit # and Sheet #**
BMP Type	
Infiltration ☐ Infiltration basin (INF-1) ☐ Bioretention (INF-2) ☐ Permeable pavement (INF-3) **Unlined Biofiltration** ☐ Biofiltration with partial retention (PR-1) **Lined Biofiltration** ☒ Biofiltration (BF-1) ☐ Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3)	**Harvest and Use** ☐ Cistern (HU-1) **Flow-thru Treatment** (describe below) ☐ With prior lawful approval to meet earlier PDP requirements ☐ Pre-treatment/forebay for an onsite retention or biofiltration BMP[2] ☐ With alternative compliance **Hydromodification Management**[3] ☐ Detention pond or vault ☐ **Other** (describe below)
BMP Purpose	
☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification	☐ Pre-treatment/forebay for another BMP ☐ Other (describe below)
BMP Verification (See BMPDM Section 8.3)	
Provide name and contact information for the party responsible to sign BMP verification forms	Joseph Brikho 245 Highland Ave. National City, CA 91950
BMP Ownership and Maintenance (See BMPDM Section 7.3 and Attachment 11)	
BMP Maintenance Category	Cat. 1 ☒ Cat. 2 ☐ Cat. 3 ☐ Cat. 4 ☐
Final owner of BMP	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe):
Maintenance of BMP into perpetuity	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe):
Discussion (As needed; Continue on subsequent pages as necessary)	

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.

E.1 Fact Sheet Quick Guide

BF-1 Biofiltration (1)

Location: Elkelton blvd. and Paradise Valley rd, Springvalley, California (3)

MS4 Permit Category (2)
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control ,
Q100 mitigation

Primary Benefits
Treatment

Description (4)

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system.

Fact Sheet Key	
1	Best Management Practice (BMP) Title
2	Categories, Standards, and Benefits
3	BMP Image
4	Main Content; Categories Include: •Description •Design Adaptations for Project Goals •Recommended Siting Criteria •Recommended BMP Component Dimensions •Design Criteria and Considerations •Conceptual Design and Sizing Approach for o Site Design o Storm Water Pollutant Control Only o Integrated Storm Water Pollutant Control and Flow Control •Maintenance Overview •Summary of Standard Inspection and Maintenance

E.19 BF-1 Biofiltration

Location: 43rd Street and Logan Avenue, San Diego, California

MS4 Permit Category
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control

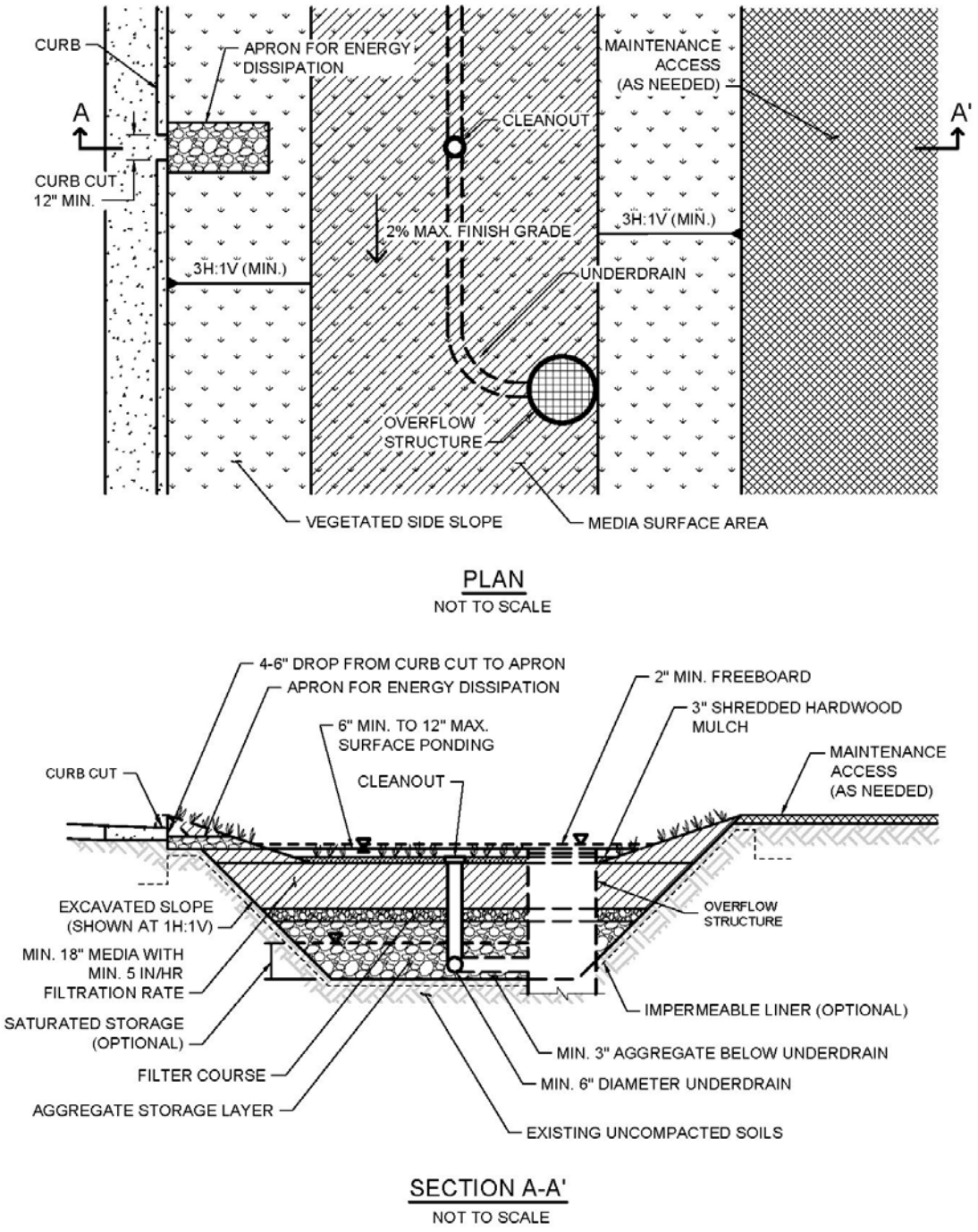
Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

Description

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Bioretention with underdrain facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. Because these types of facilities have limited or no infiltration, they are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and plant uptake.

Typical biofiltration components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility
- Overflow structure



Typical plan and Section view of a Biofiltration BMP

Design Adaptations for Project Goals

Biofiltration Treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered

runoff. This configuration is considered to provide biofiltration treatment via flow through the media layer. Storage provided above the underdrain within surface ponding, media, and aggregate storage is considered included in the biofiltration treatment volume. Saturated storage within the aggregate storage layer can be added to this design by raising the underdrain above the bottom of the aggregate storage layer or via an internal weir structure designed to maintain a specific water level elevation.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Recommended Siting Criteria

	Siting Criteria	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area must be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of County staff if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimize short circuiting of flows in the BMP and 2) incorporate additional design features requested by County staff for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.

Design Criteria and Considerations

Biofiltration must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of County staff if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hour for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of County staff if certified by a landscape architect or agronomist.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of County staff if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		

Siting and Design		*Intent/Rationale*
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix F.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Mandatory)		
☐	3 inches of well-aged, shredded hardwood mulch.	Mulch will suppress weeds and maintain moisture for plant growth.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: Appendix F.2 Biofiltration Soil Media (BSM) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications, the media meets the pollutant treatment performance criteria in Section F.1.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications must be followed. For non-standard or proprietary designs, compliance with F.1.1 ensures that adequate treatment performance will be provided.

Siting and Design		*Intent/Rationale*
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B guidance. If media surface area is under 3% of contributing area, refer to Sediment Loading calculations in Appendix B.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		

Siting and Design		*Intent/Rationale*
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
Inflow, Underdrain, and Outflow Structures		
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.

Siting and Design		*Intent/Rationale*
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design biofiltration for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet presented in Appendix B.5 to size biofiltration BMPs.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If bioretention with underdrain cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume

such as an underground vault can be used to provide remaining controls.

4. After bioretention with underdrain has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

Maintenance Overview

Normal Expected Maintenance. Biofiltration requires routine maintenance to: remove accumulated materials such as sediment, trash or debris; maintain vegetation health; maintain infiltration capacity of the media layer; replenish mulch; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

Non-Standard Maintenance or BMP Failure. If any of the following scenarios are observed, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required.

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.

- Sediment, trash, or debris accumulation greater than 25% of the surface ponding volume within one month. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials. Pretreatment components, especially for sediment, will extend the life of components that are more expensive to replace such as media, filter course, and aggregate layers.

- Erosion due to concentrated storm water runoff flow that is not readily corrected by 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.

Other Special Considerations. Biofiltration is a vegetated structural BMP. Vegetated structural BMPs that are constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. As such, vegetated structural BMPs have the potential to come under the jurisdiction of the United States Army Corps of Engineers, SDRWQCB, California Department of Fish and Wildlife, or the United States Fish and

Wildlife Service. This could result in the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP. Along with proper placement of a structural BMP, routine maintenance is key to preventing this scenario.

Sediment Loading. Consider the effects of BMP design and tributary area land uses on the clogging potential of the BMP. Complete the sediment loading analysis included in Appendix F.

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.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
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.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
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 ¼ 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).

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

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

Category	#	Description	*i*	*ii*	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA 1		unitless
	2	85th Percentile 24-hr Storm Depth	0.54		inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	17,644		sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)			sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)	1,141		sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)			sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)			sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)			sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)			sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	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	18,785	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.85	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.85	0.00	unitless
	26	Initial Design Capture Volume	719	0	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.85	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	719	0	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.85	0.00	unitless
	36	Final Effective Tributary Area	15,967	0	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	719	0	cubic-feet

No Warning Messages

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

Category	#	Description	*i*	*ii*	*iii*	Units
Basic Analysis	1	Drainage Basin ID or Name	DMA 1	-	-	unitless
	2	85th Percentile Rainfall Depth	0.54	-	-	inches
	3	Predominant NRCS Soil Type Within BMP Location	D			unitless
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Restricted			unitless
	5	Nature of Restriction	Prop. Line			unitless
	6	Do Minimum Retention Requirements Apply to this Project?	Yes	Yes	Yes	yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No			yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	No			yes/no
	9	Design Infiltration Rate Recommended by Geotechnical Engineer				in/hr
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.000	-	-	in/hr
	11	Percent of Average Annual Runoff that Must be Retained within DMA	4.5%	-	-	percentage
	12	Fraction of DCV Requiring Retention	0.02	-	-	ratio
	13	Required Retention Volume	14	-	-	cubic-feet

No Warning Messages

Automated Worksheet B.3: BMP Performance (V2.0)

Category	#	Description	*i*	*ii*	Units
BMP Inputs	1	Drainage Basin ID or Name	DMA 1	-	sq-ft
	2	Design Infiltration Rate Recommended	0.000	-	in/hr
	3	Design Capture Volume Tributary to BMP	719	-	cubic-feet
	4	Is BMP Vegetated or Unvegetated?	Vegetated		unitless
	5	Is BMP Impermeably Lined or Unlined?	Lined		unitless
	6	Does BMP Have an Underdrain?	Underdrain		unitless
	7	Does BMP Utilize Standard or Specialized Media?	Standard		unitless
	8	Provided Surface Area	890		sq-ft
	9	Provided Surface Ponding Depth	6		inches
	10	Provided Soil Media Thickness	18		inches
	11	Provided Gravel Thickness (Total Thickness)	18		inches
	12	Underdrain Offset	3		inches
	13	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	0.50		inches
	14	Specialized Soil Media Filtration Rate			in/hr
	15	Specialized Soil Media Pore Space for Retention			unitless
	16	Specialized Soil Media Pore Space for Biofiltration			unitless
	17	Specialized Gravel Media Pore Space			unitless
Retention Calculations	18	Volume Infiltrated Over 6 Hour Storm	0	0	cubic-feet
	19	Ponding Pore Space Available for Retention	0.00	1.00	unitless
	20	Soil Media Pore Space Available for Retention	0.05	0.05	unitless
	21	Gravel Pore Space Available for Retention (Above Underdrain)	0.00	0.40	unitless
	22	Gravel Pore Space Available for Retention (Below Underdrain)	0.40	0.40	unitless
	23	Effective Retention Depth	2.10	0.00	inches
	24	Fraction of DCV Retained (Independent of Drawdown Time)	0.22	0.00	ratio
	25	Calculated Retention Storage Drawdown Time	120	0	hours
	26	Efficacy of Retention Processes	0.24	0.00	ratio
	27	Volume Retained by BMP (Considering Drawdown Time)	171	0	cubic-feet
	28	Design Capture Volume Remaining for Biofiltration	548	0	cubic-feet
Biofiltration Calculations	29	Max Hydromod Flow Rate through Underdrain	0.0118	0.0000	cfs
	30	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.57	0.00	in/hr
	31	Soil Media Filtration Rate per Specifications	5.00	5.00	in/hr
	32	Soil Media Filtration Rate to be used for Sizing	0.57	0.00	in/hr
	33	Depth Biofiltered Over 6 Hour Storm	3.44	0.00	inches
	34	Ponding Pore Space Available for Biofiltration	1.00	0.00	unitless
	35	Soil Media Pore Space Available for Biofiltration	0.20	0.20	unitless
	36	Gravel Pore Space Available for Biofiltration (Above Underdrain)	0.40	0.40	unitless
	37	Effective Depth of Biofiltration Storage	15.60	0.00	inches
	38	Drawdown Time for Surface Ponding	10	0	hours
	39	Drawdown Time for Effective Biofiltration Depth	27	0	hours
	40	Total Depth Biofiltered	19.04	0.00	inches
	41	Option 1 - Biofilter 1.50 DCV: Target Volume	822	0	cubic-feet
	42	Option 1 - Provided Biofiltration Volume	822	0	cubic-feet
	43	Option 2 - Store 0.75 DCV: Target Volume	411	0	cubic-feet
	44	Option 2 - Provided Storage Volume	411	0	cubic-feet
	45	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	ratio
Result	46	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	-	yes/no
	47	Overall Portion of Performance Standard Satisfied (BMP Efficacy Factor)	1.00	0.00	ratio
	48	**Deficit of Effectively Treated Stormwater**	**0**	**n/a**	cubic-feet

No Warning Messages

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 Approval[4], PDPs must also participate in an alternative compliance program[5].

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).

B. Water Body Impairments and Priorities

List any 303(d) impaired water bodies[6] 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
Sweet Water River (lower)	Benthic Community Effects , Chlorpyrifos, Indicator Bacteria, Nitrogen, Phosphorus, Selenium, Total Dissolved Solids, Toxicity	Fecal Coliform, Phosphorus, selenium, Sulfates, Total Dissolved Solids, Total Nitrogen as N, Toxicity

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 B.6.

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

[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

ATTACHMENT 8
Documentation of DMAs with Structural Hydromodification Management BMPs

8.0 General Requirements

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

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

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

8.1 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.

BMP Sizing Spreadsheet V3.0

Project Name:	Paradise Valley Road Gas Station
Project Applicant:	
Jurisdiction:	County of San Diego
Parcel (APN):	584-160-52
Hydrologic Unit:	909.12 Sweet Water River
Rain Gauge:	Lindbergh
Total Project Area (sf):	21,458
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.0			
Project Name:	Paradise Valley Road Gas Station	Hydrologic Unit:	909.12 Sweet Water River
Project Applicant:	0	Rain Gauge:	Lindbergh
Jurisdiction:	County of San Diego	Total Project Area:	18,785
Parcel (APN):	584-160-52	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 1	BMP Type:	Biofiltration
BMP Native Soil Type:	N/A - Impervious Liner	BMP Infiltration Rate (in/hr):	N/A

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Surface Area	Surface Area (SF)
DAM 1	13,234	D	Flat	Concrete	1.0	0.05	662
DMA 1	4,410	D	Flat	Roofs	1.0	0.05	221
DMA 1	1,141	D	Flat	Landscape	0.1	0.05	6
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	18,785					Minimum BMP Size	888
						Proposed BMP Size*	900

* Assumes standard configuration

Surface Ponding Depth	6.00	in
Bioretention Soil Media Depth	18.00	in
Filter Coarse	6.00	in
Gravel Storage Layer Depth	12	in
Underdrain Offset	3.0	in

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.0			
Project Name:	Paradise Valley Road Gas Station	Hydrologic Unit:	909.12 Sweet Water River
Project Applicant:	0	Rain Gauge:	Lindbergh
Jurisdiction:	County of San Diego	Total Project Area:	18,785
Parcel (APN):	584-160-52	Low Flow Threshold:	0.1Q2
BMP Name	BMP 1	BMP Type:	Biofiltration

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
DAM 1	Lindbergh	D	Flat	0.429	0.304	0.013	**0.20**
DMA 1	Lindbergh	D	Flat	0.429	0.101	0.004	**0.07**
DMA 1	Lindbergh	D	Flat	0.429	0.026	0.001	**0.02**

3.25	**0.019**	**0.28**	**0.60**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

0.018	**0.018**	**0.28**	**0.600**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	7.0

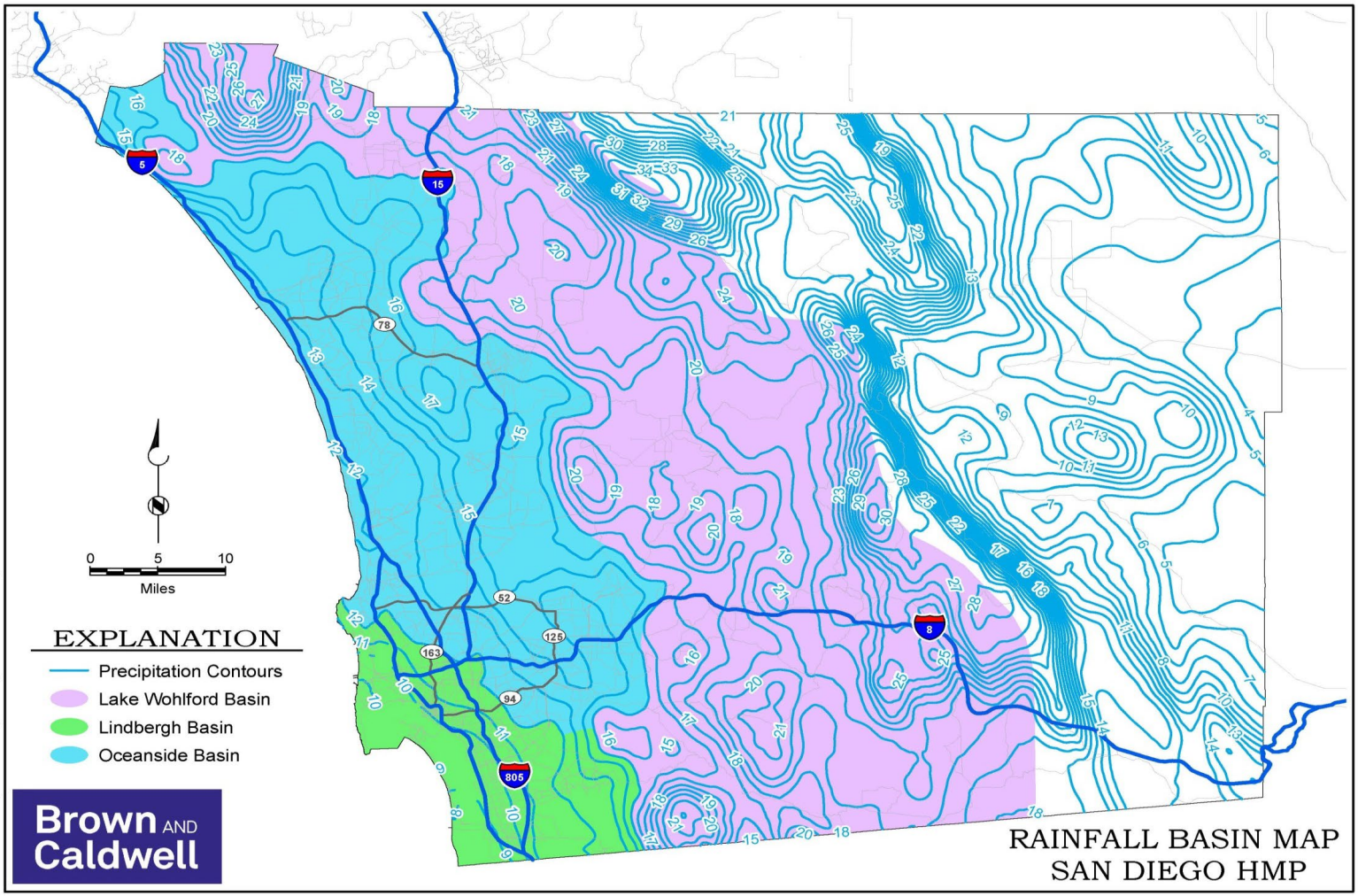

0
5
10
Miles
EXPLANATION
Precipitation Contours
Lake Wohlford Basin
Lindbergh Basin
Oceanside Basin
Brown AND Caldwell
RAINFALL BASIN MAP
SAN DIEGO HMP
File Name: P:\Projects\San Diego County\139942 - HMP Implementation Assistance\GIS\HMF GIS\Basins.mxd

Table G.2-3: Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method				
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**
0.1Q2	A	Flat	Lindbergh	0.055
0.1Q2	A	Moderate	Lindbergh	0.055
0.1Q2	A	Steep	Lindbergh	0.055
0.1Q2	B	Flat	Lindbergh	0.045
0.1Q2	B	Moderate	Lindbergh	0.045
0.1Q2	B	Steep	Lindbergh	0.045
0.1Q2	C	Flat	Lindbergh	0.035
0.1Q2	C	Moderate	Lindbergh	0.035
0.1Q2	C	Steep	Lindbergh	0.035
0.1Q2	D	Flat	Lindbergh	0.03
0.1Q2	D	Moderate	Lindbergh	0.03
0.1Q2	D	Steep	Lindbergh	0.03
0.1Q2	A	Flat	Oceanside	0.06
0.1Q2	A	Moderate	Oceanside	0.06
0.1Q2	A	Steep	Oceanside	0.06
0.1Q2	B	Flat	Oceanside	0.05
0.1Q2	B	Moderate	Oceanside	0.05
0.1Q2	B	Steep	Oceanside	0.05
0.1Q2	C	Flat	Oceanside	0.05
0.1Q2	C	Moderate	Oceanside	0.05
0.1Q2	C	Steep	Oceanside	0.045
0.1Q2	D	Flat	Oceanside	0.035
0.1Q2	D	Moderate	Oceanside	0.035
0.1Q2	D	Steep	Oceanside	0.035
0.1Q2	A	Flat	Lake Wohlford	0.085
0.1Q2	A	Moderate	Lake Wohlford	0.085
0.1Q2	A	Steep	Lake Wohlford	0.085
0.1Q2	B	Flat	Lake Wohlford	0.07

0.1Q2	B	Moderate	Lake Wohlford	0.07
0.1Q2	B	Steep	Lake Wohlford	0.07
0.1Q2	C	Flat	Lake Wohlford	0.055
0.1Q2	C	Moderate	Lake Wohlford	0.055
0.1Q2	C	Steep	Lake Wohlford	0.055
0.1Q2	D	Flat	Lake Wohlford	0.04
0.1Q2	D	Moderate	Lake Wohlford	0.04
0.1Q2	D	Steep	Lake Wohlford	0.04

Table G.2-4: Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	below low orifice inv	Rain Gauge	A
0.1Q_2	A	Flat	18	Lindbergh	0.08
0.1Q_2	A	Moderate	18	Lindbergh	0.08
0.1Q_2	A	Steep	18	Lindbergh	0.08
0.1Q_2	B	Flat	18	Lindbergh	0.065
0.1Q_2	B	Moderate	18	Lindbergh	0.065
0.1Q_2	B	Steep	18	Lindbergh	0.06
0.1Q_2	C	Flat	6	Lindbergh	0.05
0.1Q_2	C	Moderate	6	Lindbergh	0.05
0.1Q_2	C	Steep	6	Lindbergh	0.05
0.1Q_2	D	Flat	3	Lindbergh	0.05
0.1Q_2	D	Moderate	3	Lindbergh	0.05
0.1Q_2	D	Steep	3	Lindbergh	0.05
0.1Q_2	A	Flat	18	Oceanside	0.08
0.1Q_2	A	Moderate	18	Oceanside	0.075
0.1Q_2	A	Steep	18	Oceanside	0.075
0.1Q_2	B	Flat	18	Oceanside	0.07
0.1Q_2	B	Moderate	18	Oceanside	0.07
0.1Q_2	B	Steep	18	Oceanside	0.07
0.1Q_2	C	Flat	6	Oceanside	0.07
0.1Q_2	C	Moderate	6	Oceanside	0.07

0.1Q2	C	Steep	6	Oceanside	0.07
0.1Q2	D	Flat	3	Oceanside	0.07
0.1Q2	D	Moderate	3	Oceanside	0.07
0.1Q2	D	Steep	3	Oceanside	0.07
0.1Q2	A	Flat	18	Lake Wohlford	0.11
0.1Q2	A	Moderate	18	Lake Wohlford	0.11
0.1Q2	A	Steep	18	Lake Wohlford	0.105
0.1Q2	B	Flat	18	Lake Wohlford	0.09
0.1Q2	B	Moderate	18	Lake Wohlford	0.085
0.1Q2	B	Steep	18	Lake Wohlford	0.085
0.1Q2	C	Flat	6	Lake Wohlford	0.065
0.1Q2	C	Moderate	6	Lake Wohlford	0.065
0.1Q2	C	Steep	6	Lake Wohlford	0.065
0.1Q2	D	Flat	3	Lake Wohlford	0.06
0.1Q2	D	Moderate	3	Lake Wohlford	0.06
0.1Q2	D	Steep	3	Lake Wohlford	0.06

Table G.2-5: Sizing Factors for Hydromodification Flow Control Biofiltration BMPs Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A
0.1Q2	A	Flat	Lindbergh	0.32
0.1Q2	A	Moderate	Lindbergh	0.3
0.1Q2	A	Steep	Lindbergh	0.285
0.1Q2	B	Flat	Lindbergh	0.105
0.1Q2	B	Moderate	Lindbergh	0.1
0.1Q2	B	Steep	Lindbergh	0.095
0.1Q2	C	Flat	Lindbergh	0.055
0.1Q2	C	Moderate	Lindbergh	0.05
0.1Q2	C	Steep	Lindbergh	0.05
0.1Q2	D	Flat	Lindbergh	0.05
0.1Q2	D	Moderate	Lindbergh	0.05
0.1Q2	D	Steep	Lindbergh	0.05
0.1Q2	A	Flat	Oceanside	0.15
0.1Q2	A	Moderate	Oceanside	0.14
0.1Q2	A	Steep	Oceanside	0.135

0.1Q2	B	Flat	Oceanside	0.085
0.1Q2	B	Moderate	Oceanside	0.085
0.1Q2	B	Steep	Oceanside	0.085
0.1Q2	C	Flat	Oceanside	0.075
0.1Q2	C	Moderate	Oceanside	0.075
0.1Q2	C	Steep	Oceanside	0.075
0.1Q2	D	Flat	Oceanside	0.07
0.1Q2	D	Moderate	Oceanside	0.07
0.1Q2	D	Steep	Oceanside	0.07
0.1Q2	A	Flat	Lake Wohlford	0.285
0.1Q2	A	Moderate	Lake Wohlford	0.275
0.1Q2	A	Steep	Lake Wohlford	0.27
0.1Q2	B	Flat	Lake Wohlford	0.15
0.1Q2	B	Moderate	Lake Wohlford	0.145
0.1Q2	B	Steep	Lake Wohlford	0.145
0.1Q2	C	Flat	Lake Wohlford	0.07
0.1Q2	C	Moderate	Lake Wohlford	0.07
0.1Q2	C	Steep	Lake Wohlford	0.07
0.1Q2	D	Flat	Lake Wohlford	0.06
0.1Q2	D	Moderate	Lake Wohlford	0.06
0.1Q2	D	Steep	Lake Wohlford	0.06

Table G.2-6: Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	V
0.1Q2	A	Flat	Lindbergh	0.54
0.1Q2	A	Moderate	Lindbergh	0.51
0.1Q2	A	Steep	Lindbergh	0.49
0.1Q2	B	Flat	Lindbergh	0.19
0.1Q2	B	Moderate	Lindbergh	0.18
0.1Q2	B	Steep	Lindbergh	0.18
0.1Q2	C	Flat	Lindbergh	0.11
0.1Q2	C	Moderate	Lindbergh	0.11
0.1Q2	C	Steep	Lindbergh	0.11
0.1Q2	D	Flat	Lindbergh	0.09

0.1Q2	D	Moderate	Lindbergh	0.09
0.1Q2	D	Steep	Lindbergh	0.09
0.1Q2	A	Flat	Oceanside	0.26
0.1Q2	A	Moderate	Oceanside	0.25
0.1Q2	A	Steep	Oceanside	0.25
0.1Q2	B	Flat	Oceanside	0.16
0.1Q2	B	Moderate	Oceanside	0.16
0.1Q2	B	Steep	Oceanside	0.16
0.1Q2	C	Flat	Oceanside	0.14
0.1Q2	C	Moderate	Oceanside	0.14
0.1Q2	C	Steep	Oceanside	0.14
0.1Q2	D	Flat	Oceanside	0.12
0.1Q2	D	Moderate	Oceanside	0.12
0.1Q2	D	Steep	Oceanside	0.12
0.1Q2	A	Flat	Lake Wohlford	0.53
0.1Q2	A	Moderate	Lake Wohlford	0.49
0.1Q2	A	Steep	Lake Wohlford	0.49
0.1Q2	B	Flat	Lake Wohlford	0.28
0.1Q2	B	Moderate	Lake Wohlford	0.28
0.1Q2	B	Steep	Lake Wohlford	0.28
0.1Q2	C	Flat	Lake Wohlford	0.14
0.1Q2	C	Moderate	Lake Wohlford	0.14
0.1Q2	C	Steep	Lake Wohlford	0.14
0.1Q2	D	Flat	Lake Wohlford	0.12
0.1Q2	D	Moderate	Lake Wohlford	0.12
0.1Q2	D	Steep	Lake Wohlford	0.12

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).

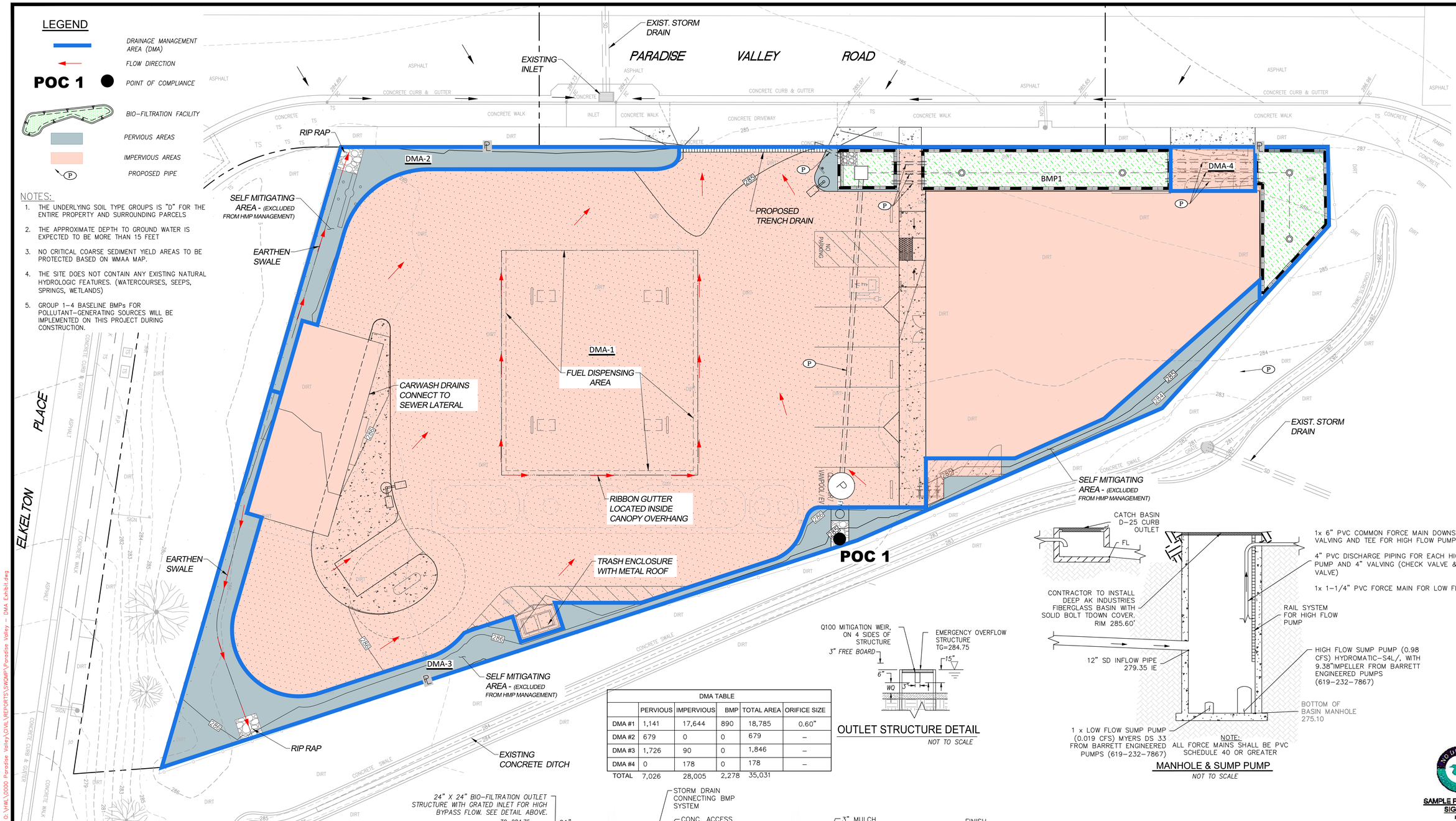
POC name or #	Channel name or #	POC Description
POC 1	909.12 Sweet Water River	POC 1, is an existing concrete channel located along the south east property line

LEGEND

- DRAINAGE MANAGEMENT AREA (DMA)
- FLOW DIRECTION
- POC 1 — POINT OF COMPLIANCE
- BIO–FILTRATION FACILITY
- PERVIOUS AREAS
- IMPERVIOUS AREAS
- (P) — PROPOSED PIPE

NOTES:

1. THE UNDERLYING SOIL TYPE GROUPS IS "D" FOR THE ENTIRE PROPERTY AND SURROUNDING PARCELS
2. THE APPROXIMATE DEPTH TO GROUND WATER IS EXPECTED TO BE MORE THAN 15 FEET
3. NO CRITICAL COARSE SEDIMENT YIELD AREAS TO BE PROTECTED BASED ON WMAA MAP.
4. THE SITE DOES NOT CONTAIN ANY EXISTING NATURAL HYDROLOGIC FEATURES. (WATERCOURSES, SEEPS, SPRINGS, WETLANDS)
5. GROUP 1–4 BASELINE BMPs FOR POLLUTANT–GENERATING SOURCES WILL BE IMPLEMENTED ON THIS PROJECT DURING CONSTRUCTION.

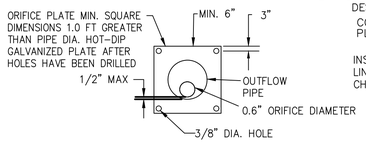


SCALE: 1" = 10'

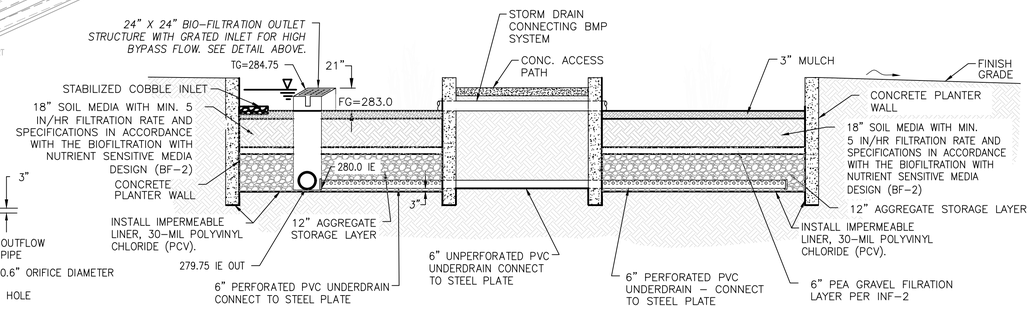
DMA TABLE					
	PERVIOUS	IMPERVIOUS	BMP	TOTAL AREA	ORIFICE SIZE
DMA #1	1,141	17,644	890	18,785	0.60"
DMA #2	679	0	0	679	–
DMA #3	1,726	90	0	1,846	–
DMA #4	0	178	0	178	–
TOTAL	7,026	28,005	2,278	35,031	

OUTLET STRUCTURE DETAIL
NOT TO SCALE

MANHOLE & SUMP PUMP
NOT TO SCALE



STAINLESS STEEL PLATE / ORIFICE DETAIL
NOT TO SCALE



PRIVATE BIO FILTRATION FACILITY DETAIL
NOT TO SCALE

SAMPLE PROHIBITIVE SIGNAGE
NTS

PERMANENT WATER QUALITY TREATMENT FACILITIES ON THIS SITE

KEEPING OUR WATER CLEAN
MAINTAIN WITH CARE
NO MODIFICATIONS WITHOUT COUNTY OF SAN DIEGO APPROVAL

WATER QUALITY ADVISORY SIGN
NTS

PREPARED BY:

HOWES | WEILER | LANDY
PLANNING & ENGINEERING
Tel. 760.929.2288 Fax. 760.929.2287
2888 LOKER AVENUE EAST SUITE 217
CARLSBAD, CA 92010
www.HWL-PE.com

REGISTERED PROFESSIONAL ENGINEER — MELLOR R. LANDY — No. 81085 Exp. 09–30–23 CIVIL — STATE OF CALIFORNIA

MELLOR R. LANDY DATE
R.C.E. 81085 EXP. 9–30–23

DMA/HMP MAP EXHIBIT

2–02–2023

SAVE DATE: 2/2/2023 ~ PLOT DATE: 2/2/2023 ~ FILE NAME: G:\HWL\0000 Paradise Valley\CIVIL\REPORTS\SWQMP\Paradise Valley – DMA Exhibit.dwg

8.3 Geomorphic Assessment of Receiving Water Channels

Insert Geomorphic Assessment behind this cover page or submit as a separate stand-alone document labeled Sub-attachment 8.3.

N/A

8.4 Vector Control Plan

Insert Vector Control Plan behind this cover page or submit as a separate stand-alone document labeled Sub-attachment 8.4.

N/A

ATTACHMENT 9
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 Exemption**[1]	Section 1.6
☒ **9.2: Watershed Management Area Analysis (WMAA) Mapping**[1]	Appendix H.1.1.2
☐ **9.3: Resource Protection Ordinance (RPO) Methods**	Appendix H.1.1.1
☐ **9.4: No Net Impact Analysis**	Appendix H.4

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

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

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

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

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

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

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

[3] Applicants may refine initial mapping results using options identified in BMPDM Appendix H.1.2.

[4] Tributary areas must be shown to demonstrate that upstream offsite PCCSYAs do not exist. If bypassing these areas, only the bypass should be shown.

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

The project site is a triangular undeveloped area surrounded be Paradise Valley Road on the north west (property frontage), Elkelton Place to the south and the off ramp of State Route 125 to the east. A small portion of CCSYA is located on the east side of State route 125, said area is at a lower elevation that the project site and is not affected by proposed project. See the attached exhibit showing the limits of disturbance with relation to the CCSYA


Untitled Map
Write a description for your map.
Legend
0
06073C
06073C
06073C
Creek
Feature 2
Feature 4
Feature 5
Paradise Gas Station
Yes
Project site
Paradise Gas Station
Elkelton Blvd
Parkbrook St
Broadview St
Paradise Valley Rd
S Bay Fwy
Elkelton Pl
Quarry Rd
125
S17
Google Earth
© 2018 Google
© 2018 NEGI
700 ft
N

REACH ID	NAME
1	Santa Margarita River
2	San Luis Rey River
3	Buena Vista Creek
4	Agua Hedionda Creek
5	San Marcos Creek
6	Encinitas Creek
7	Cottonwood Creek (Carlsbad WMA)
8	Escondido Creek
9	San Dieguito Creek - Reach 1
10	San Dieguito Creek - Reach 2
11	Lusardi Creek
12	Los Penasquitos / Poway Creek
13	Rattlesnake Creek
14	Carroll Canyon Creek
15	Rose Creek
16	San Diego River
17	Sycamore Creek
18	San Vicente Creek
19	Forester Creek
20	Chollas Creek
21	Sweetwater River - Reach 1
22	Sweetwater River - Reach 2
23	Otay River
24	Jamul / Dulzura Creek
25	Tijuana River
26	Cottonwood Creek (Tijuana WMA)
27	

Legend
- Regional WMAA Streams
- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams
- Potential Critical Coarse Sediment Yield Areas

Miles 0 5 10 15

Potential Critical Coarse Sediment Yield Areas

Regional San Diego County Watersheds

Exhibit Date: Sept. 8, 2014

Geosyntec consultants

RICK ENGINEERING COMPANY

ATTACHMENT 10
Installation Verification Form for PDP 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. Do not leave any fields blank; indicate *N/A* for any requested item that is not applicable.

PART 1 General Project and Applicant Information

Table 1: Project and Applicant Information

A. Project Summary Information	**ID No. IVF-20___-____ To be assigned by DPW-WPP**
Project Name	Paradise Valley Gas Station
Record ID (e.g. grading/improvement plan number, building permit)	Click here to enter text.
Project Address	Click here to enter text.
Assessor's Parcel Number(s) APN(s)	Click here to enter text.
Project Watershed (complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Click here to enter text.
B. Owner Information	
Name	Click here to enter text.
Address	Click here to enter text.
Email Address	Click here to enter text.
Phone Number	Click here to enter text.

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

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

Table 2: Information for Partial IVF Submittals

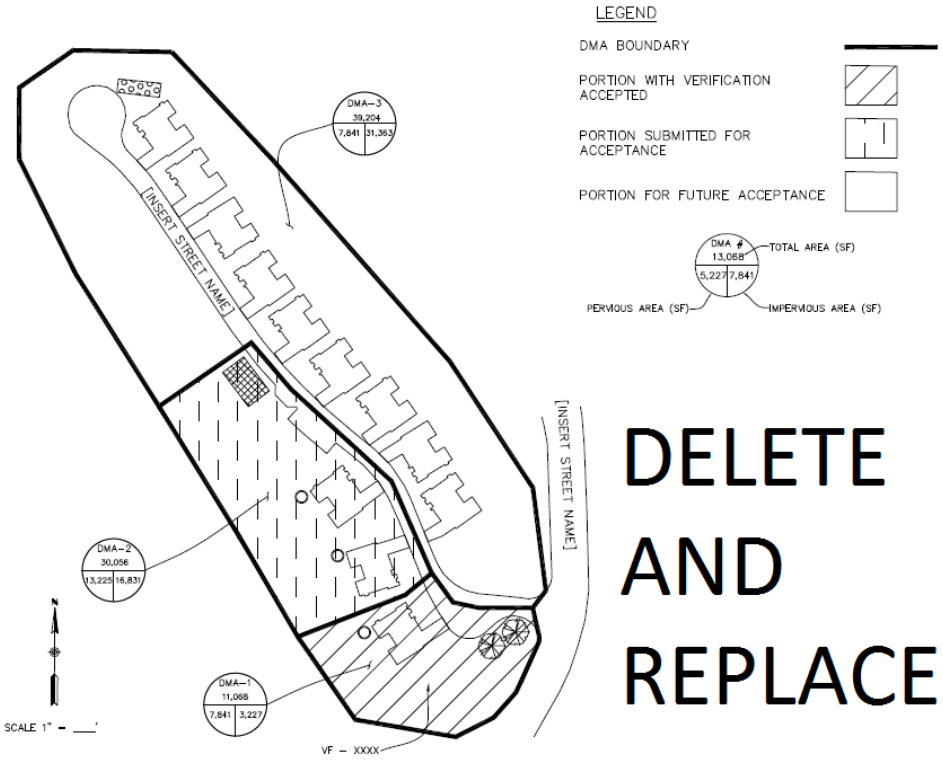
A: DMA and BMP Information

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

B: DMA and BMP Map

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

SAMPLE DMA MAP



PART 2 DMA and BMP Inventory Information

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

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

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

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

PART 3 Required Attachments for All BMPs Listed in Table 3

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

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

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

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

For Grading and Improvement projects only, ALSO submit:

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

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

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

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

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

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

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

Required only for Verifications for Partial Record Plans

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

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

PART 4 Preparer's Certification

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

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

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

[SEAL]

Preparer's Printed Name:

____Click here to enter text._____

Email: _Click here to enter text._____

Phone Number: _Click here to enter text._____

Preparer's Signed Name:

_____

Date: _Click here to enter text._____

COUNTY - OFFICIAL USE ONLY:

For County Inspectors

County Department: _____

Date verification received from EOW: _____

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

Inspector Name: _____

Inspector's Signature: _____ Date: _____

For Building Division Only

Inspection Supervisor Name: _____

Inspector Supervisor's Signature: _____ Date: _____

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

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

For Watershed Protection Program Only

Date Received: _____

WPP Reviewer: _____

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

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 11
BMP Maintenance Plans and Agreements

11.0 Cover Sheet and General Requirements

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

a. Applicability of Maintenance Agreements

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

☒ Maintenance Notification (Category 1 BMPs)

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

☐ Stormwater Maintenance Agreement (Category 2 BMPs)

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

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

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

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

b. Maintenance Plan Requirements

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

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

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

☒ Features to **facilitate inspection** (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds).

☒ Manufacturer and part number for **proprietary parts** of structural BMP(s) when applicable.

☒ **Maintenance thresholds** specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP).

☒ Recommended **equipment** to perform maintenance.

☒ When applicable, necessary special **training or certification** requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management.

Operation and Maintenance Plan

Facility Ownership & Maintenance Agreements
The following individual(s)/organization will own the facilities, including all structural and non-structural BMPs, and are responsible for maintenance in perpetuity:

Owner: Joseph Brikho
245 Highland Ave.
National City, CA 91950

Proposed Gas station project will implement the following maintenance mechanism to ensure ongoing long-term maintenance of all structural and non-structural BMPs.

Potential Permanent BMP Maintenance Mechanisms

Project proponent agreement to maintain storm water BMPs: The County may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the stormwater BMP as necessary into perpetuity. Security may be required. This agreement is subsequently recorded with the property.

Operations, Maintenance and Inspection

Typical Maintenance Requirements
The owner is required to provide maintenance and cleaning of all BMPs. The owner shall assure maintenance and cleaning per the methods described in section below.

ITEM	ACTIVITY	INTERVAL
1.	Bio-filtration facilities	4 times quarterly. Prior to the rain season & after each storm event
2.	Rip Rap Energy Dissipator	Maintained as needed

Operation and Maintenance (O&M) Plan
An O&M Plan will be prepared for the proposed project and submitted for approval by the County prior to entitlements. The O&M Plan describes the designated responsible party to manage the stormwater BMP(s), employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, maintenance agreements shall require the inspection and servicing of all structural BMPs per manufacturer or engineering specifications. See Attachment 9 for Sample Maintenance Agreement. Parties responsible for the O&M Plan shall retain records for at least 5 years. These documents shall be made available to the County for inspection upon request at any time.

Project BMP Verification

The applicant's Engineer of Record and/or the County Engineer must verify through inspection of the site that the BMPs have been constructed and implemented as proposed in the approved WQTR. The inspection must be conducted and County approval must be obtained prior to granting a certificate of occupancy. This approval may be verified through signatures on the as-built plans, specifically on the BMP sheet.

Annual BMP Operation and Maintenance Verification

The BMP owner must verify annually that the O&M Plan is being implemented by submitting a self-certification statement to the County. The verification must include a record of inspection of the BMPs prior to the rainy season (October 1st of each year).

TABLE 7-3. Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
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 must be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, County staff in the Watershed Protection Program must be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

RECORDING REQUESTED BY:

WHEN RECORDED MAIL TO:

(property owner)

SPACE ABOVE THIS LINE FOR RECORDER'S USE

MAINTENANCE NOTIFICATION AGREEMENT FOR CATEGORY 1 STORMWATER TREATMENT CONTROL BMP's

THIS AGREEMENT is made on the _____ day of _____, 20_____.
_____, the Owner(s) of the hereinafter described real property:
Address_____ Post Office _____ Zip Code _____
Assessor Parcel No.(s) _____

List, identify, locate (plan/drawing number) and describe the TC BMP(s)

_____

_____

Owner(s) of the above property acknowledge the existence of the stormwater Treatment Control Best Management Practice (TC BMP) structure(s) on the said property. Perpetual maintenance of the TC BMP(s) is the requirement of the State NPDES Permit, Order No. R9-2007-0001, Section D.1.d.(6) and the County of San Diego Watershed Protection Ordinance (WPO) Ordinance No. 10096 Section 67.812 through Section 67.814, and County Standard Urban Stormwater Mitigation Plan (SUSMP) Chapter 5. In consideration of the requirement to construct and maintain TC 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 TC BMP(s) as listed above in accordance with the maintenance plan 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 TC BMP(s) as listed above and to ensure that such responsibility shall transfer to the future owner(s).
5. I/We will abide by all of the requirements and standards of Section 67.812 through Section 67.814 of the WPO (or renumbering thereof) as it exists on the date of this Agreement, and which hereby is incorporated herein by reference.

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

_____ _____
Owner(s) Signature(s)

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

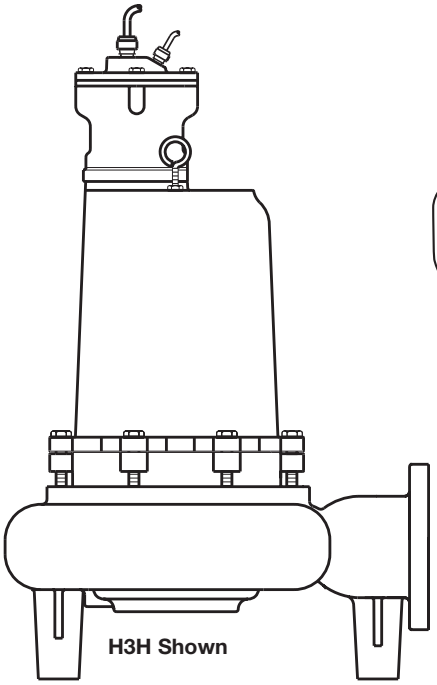
STATE OF CALIFORNIA)
COUNTY OF _____)

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

Signature _____

PENTAIR

HYDROMATIC®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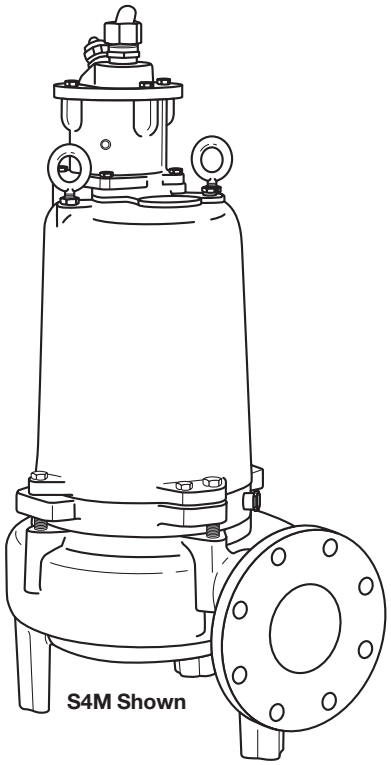
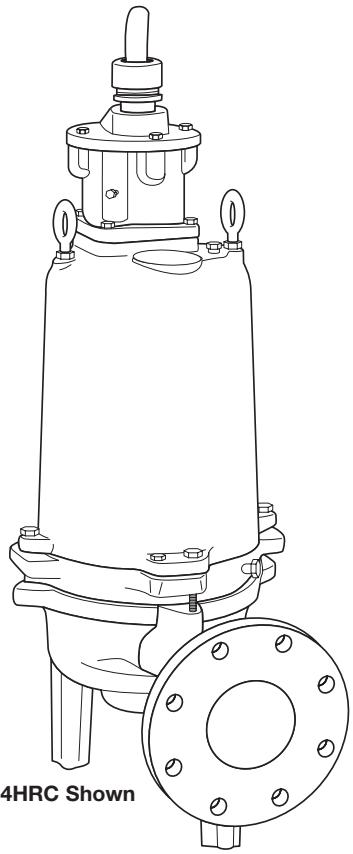

S4M Shown


S4HRC Shown

MODELS H3H, H4H, S4M, S4P, S4HRC and S4MRC

SUBMERSIBLE SOLIDS HANDLING PUMPS

INSTALLATION AND SERVICE MANUAL

For use with product built with USEM motor.

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

Item # E-03-486 | Part # 5625-486-1 | | 09/29/17

General Information

Attention:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. DO NOT THROW AWAY OR LOSE THIS MANUAL. Keep it in a safe place so that you may refer to it often. Reasonable care and safe methods should be practiced. Check local codes and requirements before installation.

Unpacking Pump:

Remove pump from carton. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage cannot be processed from the factory.

WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.

CALIFORNIA PROPOSITION 65 WARNING:

⚠WARNING This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Pumps Not Operating or in Storage:

Pumps with carbon ceramic seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 months or longer and prior to electrical start-up.

Pumps with tungsten carbide seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 weeks or longer and prior to electrical start-up.

Seal Failure:

An electrode is installed in the seal chamber so if any water enters the chamber through the first seal the electrode will be energized and a signal will be transmitted to the sensing unit at ground surface causing a red light to turn on. The electrode probe is installed in all units, but the sensing unit is supplied at extra cost and must be ordered.

In operation the seal failure unit indicates only that there is some water in the seal chamber. The pump will continue to operate, but the seal should be checked immediately after failure is indicated.

The sensing unit is recommended on all installations as good insurance against motor failure.

Pump:

The submersible pumps in this manual are supplied for 1 and 3 phase and for 200, 230, 460 or 575 volts. Power cable is supplied with the green wire for ground. Be sure green wire is connected to a good ground such as water pipe or ground stake.

Heat Sensors:

All motors have heat sensor units embedded in the motor winding to detect excessive heat. The heat sensors are set to trip at 130°C. The sensors automatically reset when motor cools to safe temperature.

The sensors are connected in series with the motor starter coil so that the starter is tripped if heat sensor opens. The motor starter is equipped with overload heaters so all normal overloads are protected by the starter.

IMPORTANT: If Hydromatic® electrical starting equipment is not supplied, the heat sensor circuit must be connected in series with the starter coil or warranty is void.

Sump Level Control:

Sump level is controlled by Hydromatic switch controls. The float is held in position in the sump by a weight attached to the power cord above the float. The cord supports the float and is adjusted for height from the surface.

Duplex systems use three controls: one set at turn-off, one set at turn-on for one pump, and one set for turn-on for two pumps. Pumps alternate operation on each successive cycle.

Two pumps operate together only if sump level rises to the third or override control. The override control also brings on the second pump in case of failure of the first pump. Extra floats with appropriate controls can be supplied for alarm functions. Triplex systems use four controls: one set at turn-off, one set at turn-on for one pump, one set at turn-on for two pumps, and one set at turn-on for three pumps. Pumps alternate each successive cycle.

Three pumps operate together only if sump level rises to the fourth control (second override). This control also brings on the third pump in case of failure of either or both of the first two pumps.

Alarm Controls:

The alarm level is usually set above the override level so the alarm will signal only if the override level is exceeded. However, some engineers prefer to have the alarm level set below the override level as it is possible for one pump to fail and the other pump to operate on the override level with the sump level never reaching the alarm level. This is particularly true in cases of low inflow capacity.

Electrical Control Panel:

It is recommended that the Hydromatic control panel be used with all pumps as proper starter heaters and connections for heat sensor wires are furnished.

Hydromatic® electrical equipment is installed in a weatherproof NEMA 3R enclosure. The electrical equipment includes a main circuit breaker for each pump, a magnetic starter with overload protection for each pump, an H-O-A switch and run light for each pump, and an electric alternator and a transformer to provide appropriate control for control circuit and alarms.

Overload Heater:

Starters with 3 leg overload protection must be supplied if the Hydromatic electrical panel is not used. The heaters must be sized in accordance with the nameplate amps on the motor. The amp draw on these submersible motors is slightly higher than a corresponding horsepower surface motor, so heaters must be sized by the nameplate rating.

IMPORTANT: Make certain the heat sensor wires are connected in series with the starter coil circuit if other than Hydromatic starters are used.

Installation Instructions

Installing Pump in Sump:

Before installing pump in sump, lay it on side and turn impeller manually. Impeller may be slightly stuck due to factory test water, so it must be broken loose with small bar or screwdriver in edge of vanes. The impeller should turn freely.

Clean all trash and sticks from sump and connect pump to piping.

A check valve must be installed on each pump. A gate or plug valve in each pump discharge line is also recommended. This valve should be installed on the discharge side of the check valve so the line pressure can be cut off if necessary to service the check valve. Single pump systems are sometimes installed without a check valve where it is desirable to self-drain the discharge line to prevent freezing. This can be done only with short discharge lines. Otherwise water will return to the sump and cause short cycling of the pump.

NEMA 4 Junction Box (Optional):

A NEMA 4 junction box should be used to make power and control connections if electrical control panel is to be set remote from the pump sump. The Hydromatic NEMA 4 junction box is provided with compression connectors for sealing all wires. No sealing compound is needed to make connections waterproof.

Wiring diagrams are provided with the panel for making connections. The size wire to use from the panel to sump depends on motor size and distance in feet.

Be sure each wire is checked out so that a wrong connection will not be made. An ohmmeter or Megger can be used to check wire continuity.

Installing Switch Controls:

The controls are supported by a mounting bracket that is attached to sump wall, cover, or to the NEMA 4 junction box.

Cord snubbers are used to hold the cord in place. Control level can be changed at any time by loosening the snubber and readjusting cord length.

NUMBER OF CONDUCTORS REQUIRED BETWEEN CONTROL PANEL AND NEMA 4 JUNCTION BOX
POWER LINES AND CONTROL WIRES CAN BE CARRIED IN CONDUIT OR CAN BE UNDERGROUND BURIED CABLE

System Type	Number of Control Wires	Number of Power Lines	Number of Ground Wires #8	HEAT SENSOR & SEAL FAILURE	
				Number of Sensor Wires	Number of Ground Wires
Simplex	4	3	1	3	1
Simplex with Alarm	6	3	1	3	1
Duplex	6	6	2	6	2
Duplex with Alarm	8	6	2	6	2

In either a simplex or duplex system, the lower or turn-off control is set just above the top of volute, so that the volute will always be submerged during the pumping cycle. The second, or turn-on control, is set about 24 inches above the lower turn-off control.

More distance between turn-on and turn-off controls can be used, but sewage may become septic, and excessive solids may collect for the pump to handle. A frequent pumping cycle is recommended for best operation.

If an alarm system is used, this control is usually set about 6 inches above the override control.

Making Electrical Connections:

All electrical wiring must be in accordance with local codes, and only competent electricians should make the installations. Complete wiring diagrams are glued to the inside cover of the panel. All wires should be checked for grounds with an ohmmeter or Megger after the connections are made. THIS IS IMPORTANT, AS ONE GROUNDED WIRE CAN CAUSE CONSIDERABLE TROUBLE.

IMPORTANT: If equipment is not properly wired and protected as recommended, the warranty is void.

Heat Sensors and Seal Failure Connections:

Be sure heat sensor wires are connected in series with the starter coil. Connections are provided on the terminal strip.

Pump Operations

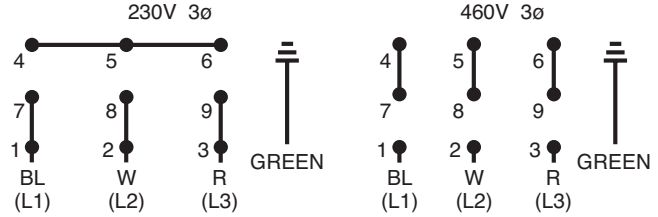
Starting System:

1. Turn H-O-A switch to Off position and then turn on main circuit breakers.
2. Open all discharge valves and allow water to rise in sump.
3. Turn H-O-A switch to Hand position on one pump and notice operation. If pump is noisy and vibrates, rotation is wrong. To change rotation, interchange any two line leads to motor 3ø only. Do not interchange main incoming lines. If duplex system, check second pump in the same manner.
4. Now set both H-O-A switches to Auto position and allow water to rise in sump until one pump starts. Allow pump to operate until the level drops to turn-off point.
5. Allow sump level to rise to start other pump. Notice run lights on panel. Pumps should alternate on each successive cycle of operation.
6. Turn both H-O-A switches to Off position and allow sump to fill to the override control level.
7. Turn both switches to Auto position and both pumps should start and operate together until level drops to turn-off point.
8. Repeat this operation cycle several times before leaving the job.
9. Check voltage when pumps are operating and check the amp draw of each pump. Check amps on each wire, as sometimes a high leg will exist. One leg can be somewhat higher (5 to 10%) without causing trouble. For excessive amp draw on one leg, the power company should be consulted.

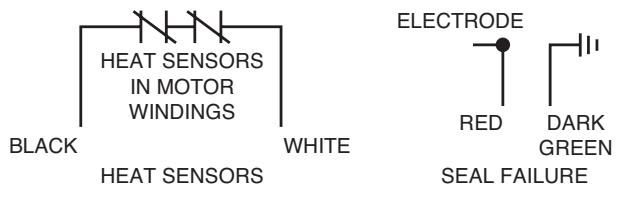
Phase Converters:

Phase converters are generally not recommended, but in cases where only single phase current is available, phase converters can be used. Be sure to size the phase converter large enough for the amp draw specified on the motor nameplate, not necessarily by motor horsepower. The warranty on all three phase submersible motors is void if operated with single phase power through a phase converter, and 3 leg ambient compensated extra-quick trip overload protectors are not used.

DUAL VOLTAGE
3 PHASE MOTOR WIRING



HEAT SENSORS AND SEAL FAILURE CONNECTIONS FOR ANY VOLTAGE MOTOR



Pump Maintenance

Lubrication or other maintenance is not required, as the motors are oil filled.

Generally, these pumps give very reliable service, and can be expected to operate for many years without failure under normal operating conditions.

Lightning:

In some areas where considerable lightning occurs, it is recommended that a lightning arrestor be installed at the control panel. Lightning arrestors are good insurance against damage to an expensive motor.

Field Service on Motor:

All submersible motors out of warranty can be serviced in the field by any reliable motor service shop. Any pump in warranty must be returned to the factory for service or repaired at an authorized Hydromatic® service center. Charges will not be allowed if in warranty pump is not taken to an authorized Hydromatic service center.

When field service is performed on a pump, these instructions should be carefully followed.

Replacing Stator:

1. If stator only is damaged, it may not be necessary to completely dismantle pump as stator and housing can be lifted from pump without disturbing seals or bearings.
2. To drain all oil from upper housing, remove drain plug in bottom of stator housing and remove plug in top of housing to allow air to enter.
3. After chamber is drained, remove hold-down bolts and lift off. Use care in lifting as the seal failure connecting wire must be disconnected before housing is completely removed.
4. Set assembly on bench and remove connection box. When box is lifted off, connection wires to motor will be exposed. These wires will probably be burned, but each wire is tagged with a metal marker giving wire number. Cut the wires.

   If the leads to the connection box are burned, a complete new connection box with new wire must be used. The wires are potted in with sealing compound and a new unit must be obtained from the factory.
5. The stator is held in the housing with a bolted-in clamp ring.
6. After ring is removed, turn housing upright and bump on hardwood blocks. This should jar the stator loose and allow it to drop out.
7. Thoroughly clean housing before replacing new stator. Replace stator and make all wire connections to connection box before replacing housing on pump. This is important as leads must be tucked behind the windings by using hands up through rotor core.

   IMPORTANT: Use only compression type insulated connectors on the wires.

   Do not tape leads as oil will deteriorate the tape and cause damage to stator and bearings.
8. Check top bearing. If clean and does not turn rough, bearings can be reused and it is not necessary to completely dismantle pump to change bearings. If bearings are damaged with dirt or heat, they must be replaced. Remember to reinstall the upper bearing load spring.
9. Replace stator housing onto seal chamber and bolt in place. BE SURE SEAL FAILURE WIRE IS CONNECTED BEFORE HOUSING IS ASSEMBLED.

   Be sure O-ring seal has been replaced. If O-ring is nicked or cut, replace with new one. This applies to all O-rings used in assembly.

WARNING

WARRANTY IS VOID IF HEAT SENSORS ARE NOT CONNECTED AS SHOWN (IN SERIES WITH CONTACTOR OIL)

TWO WIRE CONTROL OFFERING AUTOMATIC RESET

THREE WIRE CONTROL OFFERING AUTOMATIC RESET

IN CERTAIN APPLICATIONS THE NEC MAY REQUIRE THREE OVERLOAD RELAYS

10. After all leads are reconnected in the connection box, make a high voltage ground test on each wire. The only wire that should show ground is the green power lead and the ground lead in the auxiliary control cable.
11. For safety, complete pump should be air checked under water for leaks. Lay pump on side for this oil filling with oil fill hole upright. Do not completely fill; leave oil about 1 inch below the plug hole. Use only Hydromatic® submersible oil in this chamber or high grade transformer oil. Replace the plug; use Permatex on threads. Install air valve in top plug opening of motor housing and charge housing with about 10 psi of air. Be sure air is dry. Do not use air line where water may be trapped in the line. Submerge complete unit under water and check for leaks.
12. Refill motor chamber with oil. Use high grade transformer oil or Hydromatic special submersible oil. Fill chamber until oil covers top of the windings. Leave air space in top for expansion. Use Permatex on plug threads.

Replacing Seals and Bearings:

1. Drain all oil from motor chamber and seal chamber as described.
2. Remove motor housing as described.
3. Remove bolts that hold seal chamber to pump housing. Use back-off screws to break loose. With hardwood block, tap end of impeller to loosen from shaft. When free, remove impeller from shaft.
4. Lift rotating assembly (rotor, shaft and impeller) from pump case and place horizontally on bench.
5. **Impeller Removal**

   Hold rotor and remove bolt and washer from impeller end of shaft, then thread bolt back into shaft. The impeller is keyed to the shaft, so by using a screwdriver on opposite sides behind the impeller, apply force, then tap on the end of the bolt to break impeller loose from taper shaft. Remove impeller.

   IMPORTANT: The impeller is designed to be self-tightening when running, so impeller may be difficult to break loose. If this is the case, use plastic or rubber hammer on impeller tip to free. Remove impeller.
6. Remove lower seal spring and pry out seal with screwdriver.
7. To remove seal housing, take out socket head bolts and using bolts in back of holes, pry plates loose. This will force out lower seal if not already removed.
8. Remove snap ring that holds upper seal. Pull seal if it is free. If not free, it can be forced off when shaft is removed.
9. Remove 4 bolts that hold bearing housing in place. Set assembly in upright position and bump end of shaft on hardwood block. This will push the bearing from the housing and will force upper seal from shaft.
10. Use bearing puller to remove bearings. Replace with new bearings. Press only on inner face of bearing when replacing. Pressing on outer face can damage the bearing.

    IMPORTANT: DO NOT USE ANY OF THE OLD SEAL PARTS. REPLACE WITH ALL NEW SEALS.
11. Thoroughly clean all castings before replacing seals. One grain of dirt between the seal faces can cause failure.
12. Examine all O-rings for nicks before using.
13. Use Locktite® on socket head locking screw in end of shaft.

Pump Troubleshooting

Below is a list of common problems and the probable causes:

Pump will not start.

1. No power to the motor. Check for blown fuse or open circuit breaker.
2. Selector switch may be in the Off position.
3. Control circuit transformer fuse may be blown.
4. Overload heater on starter may be tripped. Push to reset.

Pump will not start and overload heaters trip.

1. Turn off power and check motor leads with Megger or ohmmeter for possible ground.
2. Check resistance of motor windings. All 3 phases should show the same reading.
3. If no grounds exist and the motor windings check OK, remove pump from sump and check for clogged or blocked impeller.

Pump operates with selector switch in Hand position but will not operate in Auto position.

1. This indicates trouble in the float level control or the alternator relay.

2. Check control panel for trouble.

Pump runs but will not shut off.

1. Pump may be air locked. Turn pump off and let set for several minutes, then restart.
2. Lower float control may be hung-up in the closed position. Check in sump to be sure control is free.
3. Selector switch may be in the Hand position.

Pump does not deliver proper capacity.

1. Discharge gate valve may be partially closed or partially clogged.
2. Check valve may be partially clogged. Raise level up and down to clear.
3. Pump may be running in wrong direction. Low speed pumps can operate in reverse direction without much noise or vibration.
4. Discharge head may be too high. Check total head with gauge when pump is operating. Total head is discharge gauge pressure converted to feet plus vertical height from water level in sump to center line of pressure gauge in discharge line. Gauge should be installed on pump side of all valves. Multiply gauge pressure in pounds by 2.31 to get head in feet.
5. If pump has been in service for some time and capacity falls off, remove pump and check for wear or clogged impeller.

Motor stops and then restarts after short period but overload heaters in starter do not trip.

1. This indicates heat sensors in the motor are tripping due to excessive heat. Impeller may be partially clogged giving a sustained overload but not high enough to trip overload heater switch.
2. Motor may be operating out of liquid due to a failed level control.
3. Pump may be operating on a short cycle due to sump being too small or from water returning to sump due to a leaking check valve.

Common Parts List

Ref. No.	Part No.	Part Description	Qty.
1	19101A010	SCREW – HHC, 3/8-16UNC x 1	8
2	016640081	PLUG – PIPE, 3/8	1
3	152770305	35' CORD ASSEMBLY 10-4	1
	152770315	35' CORD ASSEMBLY 8-4 SOOW	1
	152770325	35' CORD ASSEMBLY 8-4 W	1
	152770335	35' CORD ASSEMBLY 6-4	1
4	000650031	UPPER BEARING – BALL	1
5	001780041	SCREW-HHC	4
6	009750171	RING – RETAINING	1
7	070720002	HOUSING – SEAL	1
8	009750031	RING – RETAIN. (EXT)	1
9	001500291	O-RING, 1/8 x 3.359 ID #2-237	1
10	001500241	O-RING, 1/8 x 8.984 ID #2-270	2
11	142990021	KEY – 1/8 SQ.	VARIES
12	070700002	HOUSING – BEARING	1

Ref. No.	Part No.	Part Description	Qty.
13	084720085	SEAL FAILURE ASS'Y	1
14	070690002	HOUSING – MOTOR	1
15	000640041	SPRING – BEARING ADJ.	1
16	12672A001	CONNECTOR – SPLICE	3
17	001500071	O-RING, 1/8 x 2.234 ID #2-228	1
18	000730011	CONNECTOR – WIRE	3
19	001500121	O-RING, 1/8 x 3.734 ID #2-240	1
20	19101A021	SCREW – HHC, 3/8-16UNC x 1-1/2	2
21	060000211	WIRE W/TERMINAL	1
22	070740003	RING – RETAINING	1
23	009200011	SEAL – UPPER, CARBON CERAMIC	1
24	081000005	SEAL – LOWER, CARBON CERAMIC	1
25	002390251	SCREW – HHC, 1/2-13UNC x 3-1/2 S4P, H3H and H4H	4
	19103A062	SCREW – HHC, 1/2-13 UNC x 3-1/4 S4M, S4MRC and S4HRC	4

Ref. No.	Part No.	Part Description	Qty.
26	083460033	KEY, 3/8 S4P, H3H and H4H	1
	083460011	KEY, 3/8 S4M, S4MRC and S4HRC	1
27	000650311	BEARING – BALL S4P, H3H and H4H	1
	08565A027	BEARING – BALL S4M, S4MRC and S4HRC	1
28	007360061	SPACER	VARIES
29	010060011	CONNECTOR (STATOR W/CONN. BOX)	VARIES
30	008530001	CONNECTOR	VARIES
31	024940001	CONNECTOR – WIRE	VARIES
	151760007	LIFTING BAIL	1

Motor Parts List

S4M and S4MRC – 4-Pole 1750 RPM

Item	Description	5 HP 230/1/1750	5–7.5 HP 200/3/1750	5–7.5 HP 230/3/1750	5–7.5 HP 460/3/1750	5–7.5 HP 575/3/1750	7.5 HP 230/1/1750
A1	Connection Box	071380015	071380015	071380005	071380005	071380015	071380015
A2	Rotor/Shaft Ass'y	141420115	141390115	141390115	141390115	141390115	141440115
A3	Stator	141420011	141402031	141400031	141400031	141406031	141440011

Item	Description	10 HP 200/3/1750	10 HP 230/3/1750	10 HP 460/3/1750	10 HP 575/3/1750	15 HP 200/3/1750	15 HP 230/3/1750	15 HP 460/3/1750	15 HP 575/3/1750
A1	Connection Box	071380015	071380005	071380005	071380015	071380015	071380005	071380005	071380015
A2	Rotor/Shaft Ass'y	141410115	141410115	141410115	141410115	141410115	141410115	141410115	141410115
A3	Stator	141412031	141410031	141410031	141416031	141432031	141430031	141430031	141436031

S4M and S4MRC – 6-Pole 1150 RPM

Item	Description	3 & 5 HP 200/3/1150	3 & 5 HP 230/3/1150	3 & 5 HP 460/3/1150	3 & 5 HP 575/3/1150
A1	Connection Box	071380015	071380005	071380005	071380015
A2	Rotor/Shaft Ass'y	141390115	141390115	141390115	141390115
A3	Stator	142972031	142970031	142970031	142976031

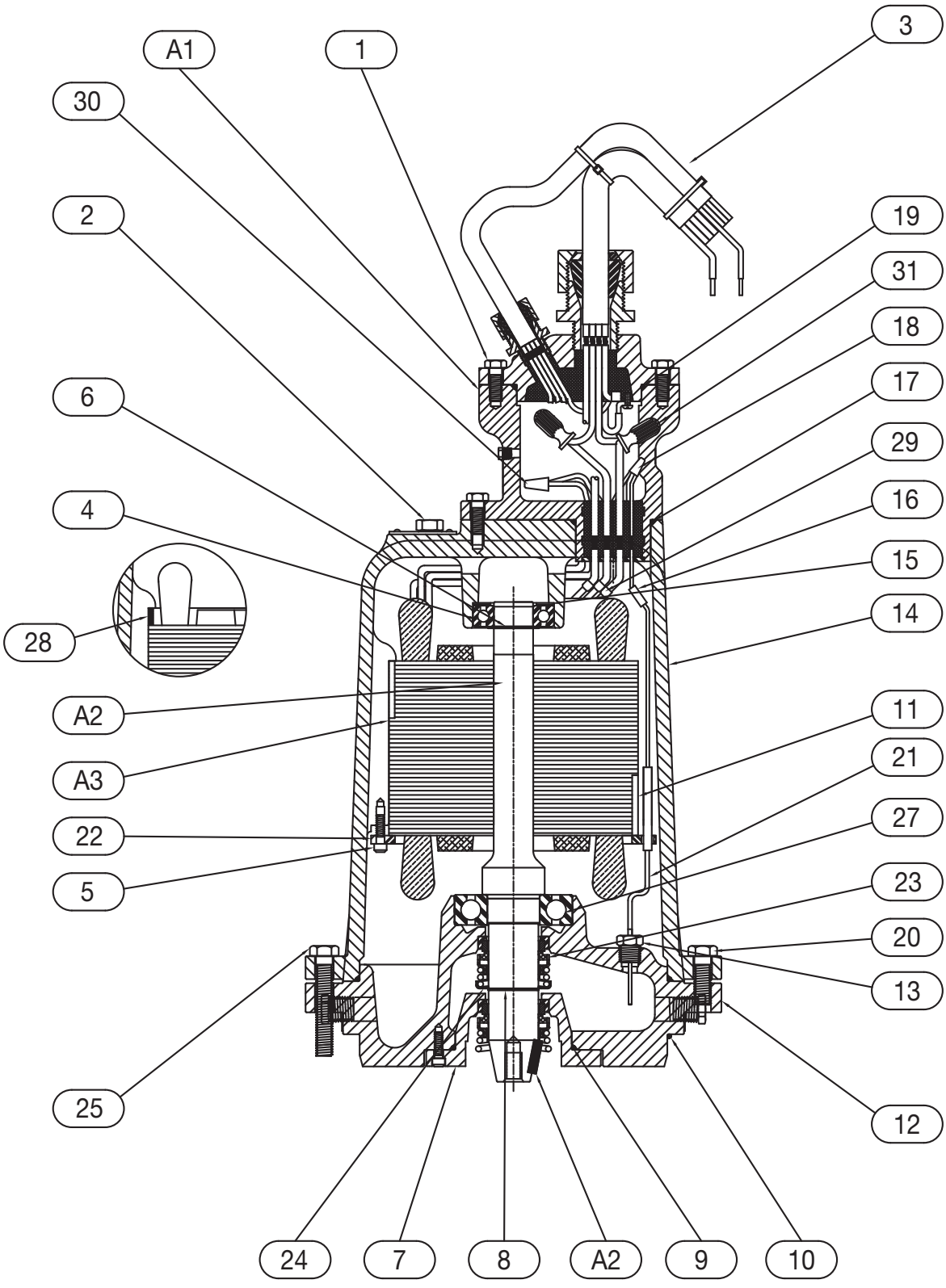
S4P, H3H and H4H – 1750 RPM

Item	Description	5 HP 200/1/1750	5 HP 230/1/1750	5 & 7.5 HP 200/3/1750	5 & 7.5 HP 230/3/1750	5 & 7.5 HP 460/3/1750	5 & 7.5 HP 575/3/1750	7.5 HP 230/1/1750	10 HP 200/3/1750
A1	Connection Box	071380015	071380015	071380015	071380005	071380005	071380015	071380015	071380015
A2	Rotor/Shaft Ass'y	141420145	141420145	141390155	141390155	141390155	141390155	141440155	141410155
A3	Stator	141422011	141420011	141402031	141400031	141400031	141406031	141440011	141412031

Item	Description	10 HP 230/3/1750	10 HP 460/3/1750	10 HP 575/3/1750	15 HP 200/3/1750	15 HP 230/3/1750	15 HP 460/3/1750	15 HP 575/3/1750
A1	Connection Box	071380005	071380005	071380015	071380015	071380005	071380005	071380015
A2	Rotor/Shaft Ass'y	141410155	141410155	141410155	141410155	141410155	141410155	141410155
A3	Stator	141410031	141410031	141416031	141432031	141430031	141430031	141436031

S4HRC – 3450 RPM

Item	Description	10 HP 200/3/3450	10 HP 230/3/3450	10 HP 460/3/3450	10 HP 575/3/3450	15 HP 200/3/3450	15 HP 230/3/3450	15 HP 460/3/3450	15 HP 575/3/3450
A1	Connection Box	071380015	071380005	071380005	071380015	071380015	071380005	071380005	071380015
A2	Rotor/Shaft Ass'y	141450115	141450115	141450115	141450115	141450115	141450115	141450115	141450115
A3	Stator	141452031	141450031	141450031	141456031	141462031	141460031	141460031	141466031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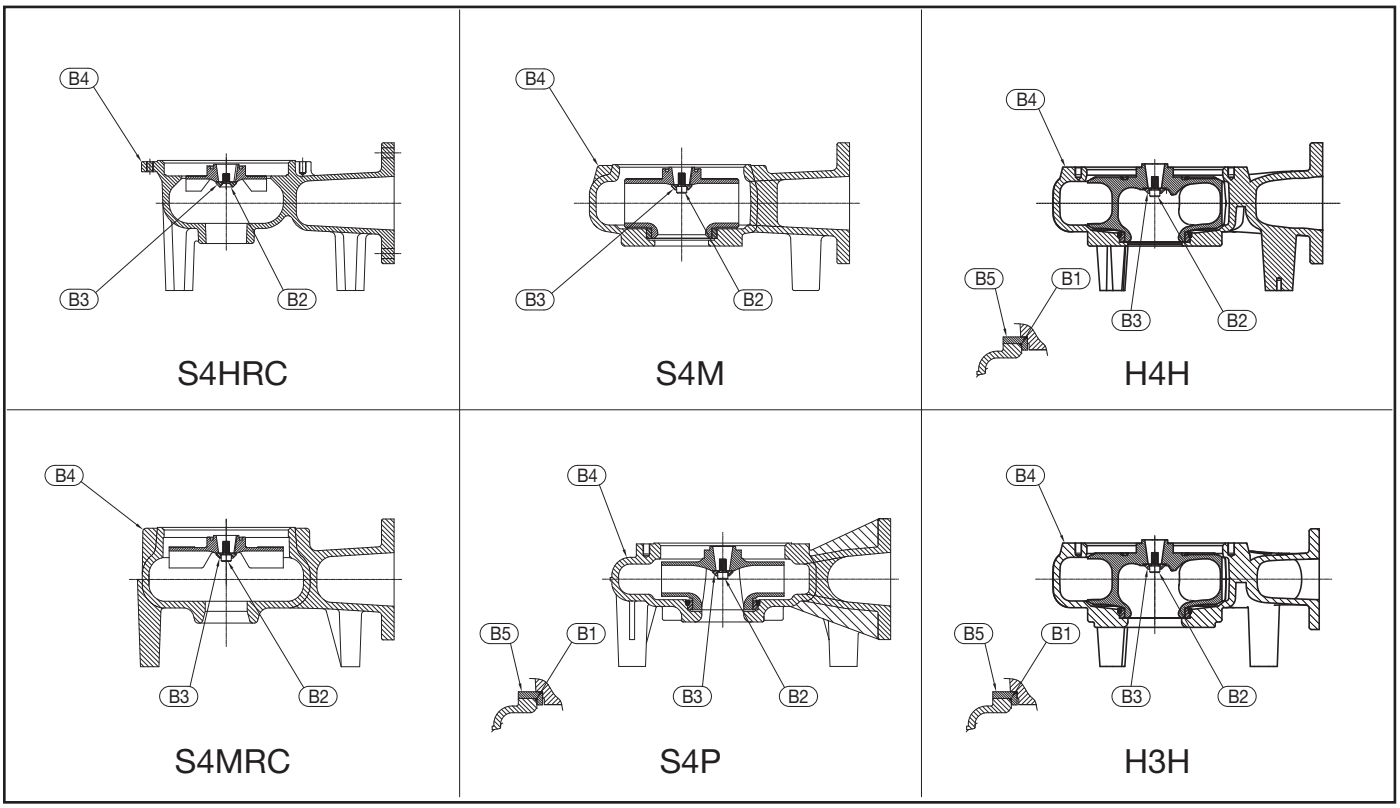
Wet Ends Parts List



Item	Description	S4M	S4P	S4HRC	S4MRC	H4H	H3H
B1	O-RING, 1/8 x 9.984 ID #2-274	–	001500471	–	–	001500471	001500471
B2	SCREW – CAP	005680021	005680021	029210041	005680021	005680021	005680021
B3	WASHER – IMPELLER SST	080230001	080230001	080230011	080230001	080230001	080230001
B4	VOLUTE	070680015	137210015	082120002	070800002	151470015	151470002
B5	SPACER	–	137720003	–	–	137720003	137720003
–	IMPELLER	070710152 (6.88)	137220192 (7.13)	082130082 (4.69)	070810082 (6.75)	151460202 (8.13)	151460062 (8.50)
		070710232 (7.38)	137220252 (8.38)	082130042 (5.00)	070810022 (8.00)	151460052 (8.75)	151460032 (9.25)
		070710122 (7.88)	137220062 (8.50)	082130052 (5.69)	070810012 (8.50)	151460012 (9.75)	151460002 (10.00)
		070710102 (8.88)	137220052 (9.00)	–	070810092 (8.75)	–	–
		–	137220012 (10.00)	–	070810002 (9.00)	–	–

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STANDARD LIMITED WARRANTY

Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: http://forms.pentairliterature.com/startupform/startupform.asp?type=h. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/ OEM parts.

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Warranty Rev. 12/13

UNILIFT KP 150, KP 250, KP 350

Installation and operating instructions

C US

GRUNDFOS

UNILIFT KP 150, KP 250, KP 350

English (US)
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Original installation and operating instructions

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1. Limited warranty

Products manufactured by Grundfos Pumps Corporation (Grundfos) are warranted to the original user only to be free of defects in material and workmanship for a period of 24 months from date of installation, but not more than 30 months from date of manufacture. Grundfos' liability under this warranty shall be limited to repairing or replacing at Grundfos' option, without charge, F.O.B. Grundfos' factory or authorized service station, any product of Grundfos manufacture. Grundfos will not be liable for any costs of removal, installation, transportation, or any other charges that may arise in connection with a warranty claim.

Products which are sold, but not manufactured by Grundfos, are subject to the warranty provided by the manufacturer of said products and not by Grundfos' warranty.

Grundfos will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with Grundfos' printed installation and operating instructions and accepted codes of good practice. The warranty does not cover normal wear and tear.

To obtain service under this warranty, the defective product must be returned to the distributor or dealer of Grundfos' products from which it was purchased together with proof of purchase and installation date, failure date and supporting installation data. Unless otherwise provided, the distributor or dealer will contact Grundfos or an authorized service station for instructions. Any defective product to be returned to Grundfos or a service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed.

Grundfos will not be liable for any incidental or consequential damages, losses, or expenses arising from installation, use, or any other causes. There are no express or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

Products which are repaired or replaced by Grundfos or authorized service center under the provisions of these limited warranty terms will continue to be covered by Grundfos warranty only through the remainder of the original warranty period set forth by the original purchase date.

2. General information

Read this document before you install the product. Installation and operation must comply with local regulations and accepted codes of good practice.

Successful operation depends on careful attention to the procedures described in this manual. Keep this manual for future use.

2.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION
Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

SIGNAL WORD
Description of the hazard
Consequence of ignoring the warning
- Action to avoid the hazard.

2.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

FM Observe these instructions for explosion-proof products.

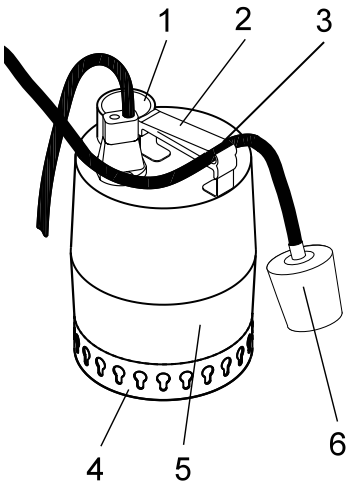
A blue or gray circle with a white graphical symbol indicates that an action must be taken.

A red or gray circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.

If these instructions are not observed, it may result in malfunction or damage to the equipment.

Tips and advice that make the work easier.

2.3 Overview drawing



TM034327

UNILIFT KP pump

Pos.	Description
1	Outlet port 1.25" NPT
2	Handle
3	Clamp
4	Inlet strainer
5	Pump housing
6	Float switch (optional)

3. Receiving the product

CAUTION
Crushing of feet
Minor or moderate personal injury
- Wear safety shoes when handling the product.
- Use the pump handle to move the pump. Do not lift it by the power cable.

3.1 Inspecting the product

Check that the product received is in accordance with the order.

Check that the voltage and frequency of the product match the voltage and frequency of the installation site.

3.2 Scope of delivery

The box contains the following items:
- pump
- power cable
- float switch (if included with the model)
- installation and operating instructions.

4. Installing the product

DANGER
Electric shock
Death or serious personal injury
- The installation, electrical connection, and maintenance of the product must be carried out by an authorized electrician in accordance with the National Electrical Code and any state, local governing codes and regulations.

DANGER
Electric shock
Death or serious personal injury
- Switch off the power supply before starting any work on the product.
- Make sure that the power supply cannot be accidentally switched on.

DANGER
Electric shock
Death or serious personal injury
- Pump installation in a sump pit, basin or tank must be carried out by qualified, specially trained persons in accordance with the National Electrical Code and any state, local governing codes and regulations.

DANGER
Electric shock
Death or serious personal injury
- Route the power cable in a way that supports it and protects it from being cut, pinched or damaged.
- If the power cable is cut, pinched, or damaged, replace it before using the product.

DANGER

Electric shock

Death or serious personal injury

- Do not remove the power cable and strain relief.
- Do not connect electrical conduit to the pump.

WARNING

Moving parts

Minor or moderate personal injury

- Make sure that persons cannot come into contact with moving parts.

If the pump is used without a float switch, use an approved level controller with a motor protection unit and set the current rating to match the nominal current marked on the product's nameplate.

Do not lift the pump by the power cable or by the outlet pipe or hose. If the pump is installed in a well or tank, lower and lift it by means of a wire or chain fastened to the pump handle.

4.1 Pipe connection

Threaded steel or rigid plastic pipes can be screwed directly into the 1.25" NPT outlet port. For permanent installation, we recommend that you fit a union, a check valve and a gate valve in the outlet pipe.

Other recommendations:

- For portable or temporary installations, a plastic outlet pipe can be used in conjunction with a suitable screwed connection or hose coupling.
- To remove the pump, secure a cable to the pump handle. Do not remove it by the pipes.
- Threads must be sealed using Teflon® tape.

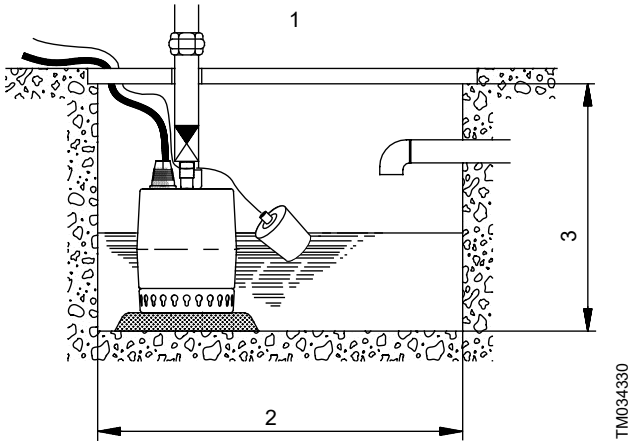
Do not install the pump hanging from the outlet pipe or hose.

Do not lift the pump by its power cable. Lower and lift it by means of a wire or chain fastened to the pump handle.

4.2 Minimum space

When the pump is installed in a permanent installation with a float switch, and the cable length is set to the minimum length of at least 2.5 in. (63.5 mm), the minimum dimensions of the sump pit, basin or tank must be as shown in fig. Minimum installation dimensions.

In addition, the sump pit, basin or tank must be sized according to the relation between the water flow to the sump pit, basin or tank and the pump capacity.



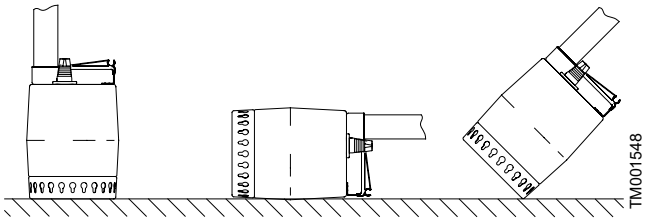
Minimum installation dimensions

Pos.	Description
1	With float switch
2	14 in. (356 mm)
3	16 in. (407 mm)

4.3 Location

Pumps with or without a float switch can be used in vertical position with the outlet port uppermost or in horizontal or tilted position with the outlet port as the highest point of the pump. See fig. Pump positions.

During operation, the inlet strainer must be completely covered by the pumped liquid.

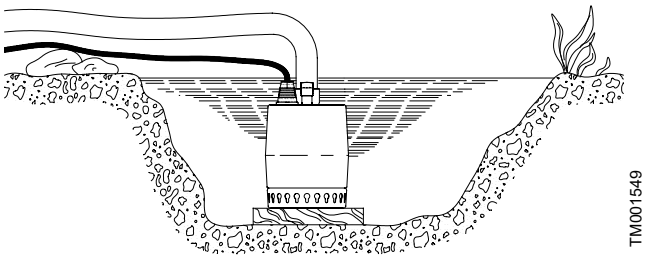


Pump positions

When the pipe or hose has been connected, place the pump in its operating position.

Position the pump so that the inlet strainer will not be blocked by sludge, mud or similar materials.

We recommend that you place the pump on a solid base. See fig. Pump placed on a plate.



Pump placed on a plate

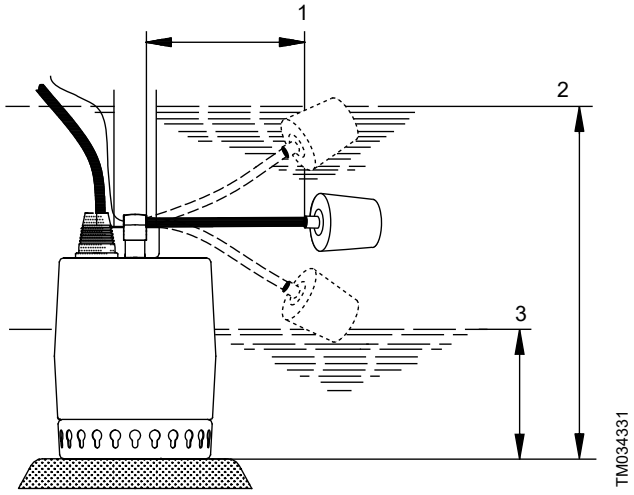
4.4 Adjustment of cable length for a float switch

The difference in level between start and stop can be adjusted by changing the free cable length between the float switch and the pump handle.

- An increased free cable length will result in fewer starts and stops and a large difference in level.
- A reduced free cable length will result in more frequent starts and stops and a small difference in level.

The free cable length must be:

- at least 2.5 in. (63.5 mm)
- no more than 6 in. (152 mm)



Start and stop levels

Pos.	Description
1	Minimum and maximum cable length
2	Start
3	Stop

The start and stop levels vary according to the cable length.

UNILIFT KP start and stop levels				
Pump type	Cable length min. 2.5 in. (63.5 mm)		Cable length max. 6 in. (152 mm)	
	Start	Stop	Start	Stop
KP 150 KP 250	11.5 in. (292 mm)	5.5 in. (140 mm)	12.5 in. (318 mm)	3.5 in. (89 mm)
KP 350	12 in. (305 mm)	6 in. (152 mm)	13 in. (330 mm)	4 in. (102 mm)

Manual operation can be achieved in one of two ways:

- Unplug both the pump and float switch from the wall socket. Insert the pump plug into the wall socket.
- Keep the float switch in a high position by attaching it to the outlet pipe or hose.

4.5 Check valve

Whenever the pump is installed in a permanent installation with a float switch, a check valve must be fitted in the outlet pipe or hose.

4.6 Electrical connection

DANGER

Electric shock

Death or serious personal injury

- Pump installation in a sump pit, basin or tank must be carried out by qualified, specially trained persons in accordance with the National Electrical Code and any state, local governing codes and regulations.

WARNING

Electric shock

Death or serious personal injury

- Connect the product only to a properly grounded receptacle.
- We recommend that you connect the pump to an electrical circuit with a Ground Fault Circuit Interrupter (GFCI).

WARNING

Electric shock

Death or serious personal injury

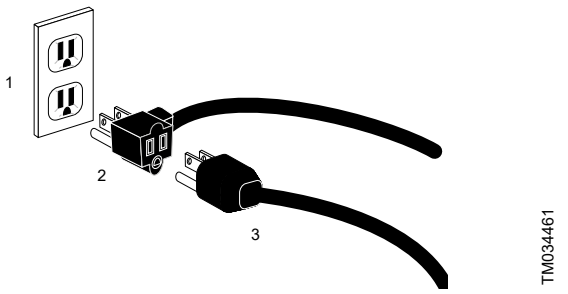
- The protective ground of the pump power plug must be connected to the protective ground receptacle of the power outlet.
- The plug must have the same ground connection system as that of the power outlet. If not, use a suitable adapter.

The electrical connection must be carried out in accordance with local regulations and follow the National Electrical Code (USA) and the Canadian Electrical Code. The pump must be grounded. The operating voltage and frequency are marked on the nameplate. Make sure that the motor is suitable for the power supply on which it will be used.

Power supply

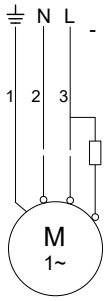
- 1 x 115 V, 60 Hz

To connect the pump for manual operation, insert the pump plug into a wall socket. If a float switch is included for automatic operation, it will be of the "piggy-back" design. Insert the float-switch plug into the wall socket, and insert the pump plug into the back of the float-switch plug.



Pump and float-switch plugs

Pos.	Description
1	115 V outlet
2	Float-switch plug ("Piggy-back")
3	Pump plug



TM1040337

Wiring diagram

Pos.	Description
1	Green
2	White
3	Black

Motor protection

The UNILIFT KP pumps have built-in thermal overload protection and require no additional motor protection. If the motor is overloaded, it stops automatically. When cooled to normal temperature, the motor starts automatically.

5. Starting up the product

DANGER

Moving parts

Death or serious personal injury

- Do not touch the inside of the pump while the pump is running.
- The inlet strainer must always be fitted to the pump during operation.

5.1 Starting

Before starting the pump, check that the following requirements are fulfilled:

- The pump is submerged in liquid. During normal operation, the inlet strainer of the pump must be below the surface of the liquid.
- The pump is placed on a base so that the inlet strainer is not blocked by sludge, mud or similar materials.
- The pipe or hose connection is tight.
- The outlet pipe is open, that is the hose is not bent, etc.
- The pump is connected to the power supply in accordance with the instructions.
- For pumps with a float switch, check that the float switch will allow the pump to pump down to the chosen level according to fig. Start and stop levels. If you want to pump below this level, hold the float switch in vertical position.

Startup procedure:

Switch on the pump and check:

- that the pump is operating properly
- that water is being pumped.

Related information

4.4 Adjustment of cable length for a float switch

6. Product introduction

6.1 Product description

The Grundfos UNILIFT KP 150, KP 250 and KP 350 pumps are single-stage, submersible pumps designed for pumping grey water, that is, the wastewater from showers, sinks, washing machines, etc.

This pump has been evaluated for use with water, grey wastewater and heated wastewater.

The pump is capable of pumping water which contains a limited quantity of spherical solids up to 0.39 in. (10 mm) in diameter without being blocked or damaged.

The product is designed for automatic operation with a float switch or for manual operation.

The product can be installed in a permanent installation or used as a portable pump.

6.2 Applications

DANGER

Electric shock

Death or serious personal injury

- Do not use the pumps in or at swimming pools, garden ponds, etc. when there are persons in the water.

If the pump has been used for very dirty or chlorinated water, flush the pump thoroughly with clean water after use.

Wear gloves and other suitable personal protective equipment in accordance with local regulations. Observe local regulations on any exposure to wastewater.

The product is not designed for pumping stones and similar materials

Incorrect use of the product, for example resulting in blockage or wear of the pump, will void the pump's warranty. Note that the pump is not suitable for these liquids:

- sewage
- liquids containing long fibers
- flammable liquids (oil, gasoline, etc.)
- aggressive liquids
- liquids containing solids exceeding the pump's recommended maximum particle size of 0.39 in. (10 mm).

Pumping of particles exceeding maximum particle size for the pump may block or damage the pump.

The pump contains approximately 70 ml of non-poisonous motor liquid that may pollute the pumped liquid if the pump should leak.

The pump is suitable for the following applications.

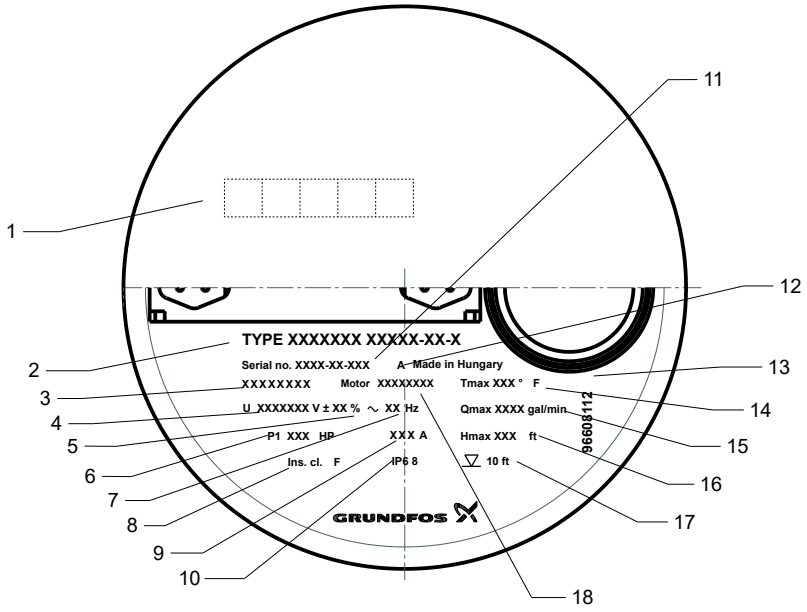
Applications	KP 150	KP 250	KP 350
Drainage of basements or buildings prone to flooding.	•	•	•
Pumping of wastewater from washing machines, sinks, baths, showers, etc., up to the sewer level.	•	•	•
Dewatering of sites or pumping of water for fountains.	•	•	•
Pumping in draining wells.	•	•	•
Emptying of swimming pools, ponds, tanks, or fountains.	•	•	•

Check the regional or local EX-approval requirements for surface water at gas stations and in parking areas.

Note: UNILIFT KP does not have any explosion-proof approval. See the Grundfos SL range.

6.3 Identification

6.3.1 Nameplate



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Nameplate information, located on the top of the pump

Pos.	Description
1	Approvals
2	Product type
3	Product number
4	Supply voltage [V]
5	Voltage tolerance [%]
6	Power input [hp]
7	Frequency [Hz]
8	Insulation class
9	Max. current [A]
10	Enclosure class
11	Factory code and production code (year and week)
12	Model
13	Nameplate layout
14	Max. liquid temperature [°F]
15	Max. flow rate [gpm]
16	Max. head [ft]
17	Max. installation depth [ft]
18	Motor number

Related information

6.3.2 Type key

6.3.2 Type key

Example: UNILIFT KP 150 A 1

Code	Explanation	Designation
UNILIFT KP	Type range	
150 250 350		Rated motor output, P_2 [W]
A	Float switch, automatic operation	Level control
M	No level switch, manual operation	
1	Single-phase	Motor
3	Three-phase	

6.4 Functions

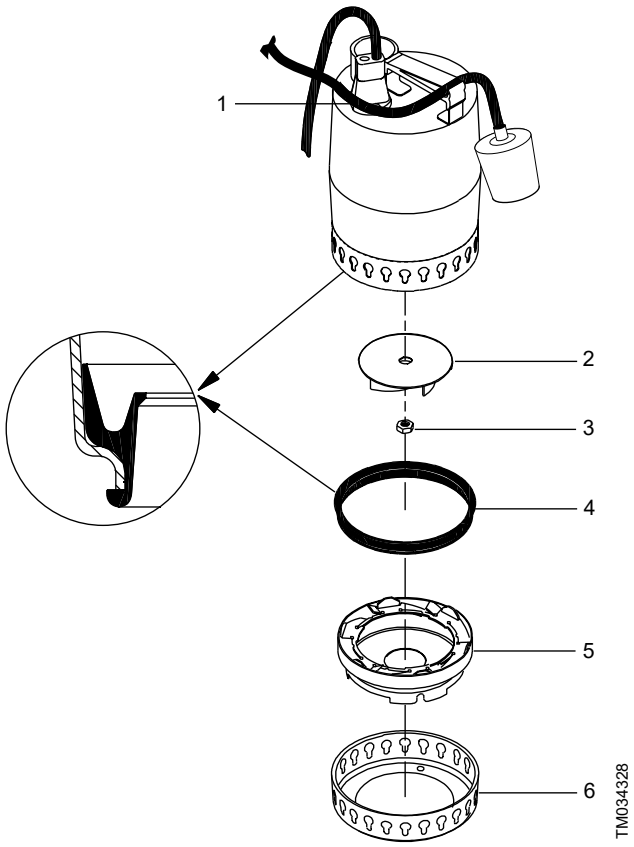
Pump with float switch

The float switch enables automatic start and stop of the pump according to the water level.

Pump without float switch

A pump without a float switch requires manual. external start and stop.

6.5 Pump construction



Pump components

Pos.	Description
1	Power cable
2	Impeller
3	Nut
4	Gasket
5	Pump housing
6	Strainer

7. Servicing the product

DANGER

Electric shock

Death or serious personal injury

- Switch off the power supply before starting any work on the product. Make sure that the power supply cannot be accidentally switched on.

CAUTION

Biological hazard

Minor or moderate personal injury

- Before carrying out maintenance and service, flush the pump thoroughly with clean water.
- After dismantling the pump, rinse the pump parts in clean water.

CAUTION

Sharp element

Minor or moderate personal injury

- Wear protective gloves.
- Never touch the inside of the pump while the pump is running.

CAUTION

Biological hazard

Minor or moderate personal injury

- If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

Service must be carried out by specially trained persons. Furthermore, all rules and regulations covering safety, health and environment must be observed.

Under normal operating conditions, the pump is maintenance-free.

If the pump has been used for liquids other than clean water, it must be flushed through with clean water immediately after use. See section Cleaning the pump.

Related information

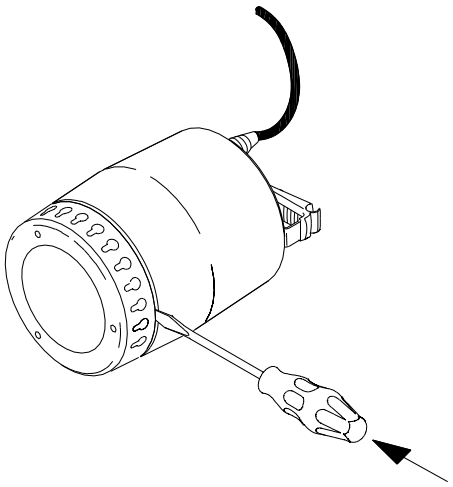
7.1 Cleaning the pump

7.1 Cleaning the pump

If the pump does not deliver a sufficient quantity of water because of sediment, dismantle and clean the pump.

To dismantle the pump, follow this procedure:

1. Disconnect the power supply.
2. Allow the pump to drain.
3. Carefully loosen the inlet strainer by inserting a screwdriver in the recess between the pump housing and the strainer. Use the screwdriver to push apart the outer casing and the strainer. Repeat the procedure, working around the pump, until the strainer is free and can be removed. See the figure below.



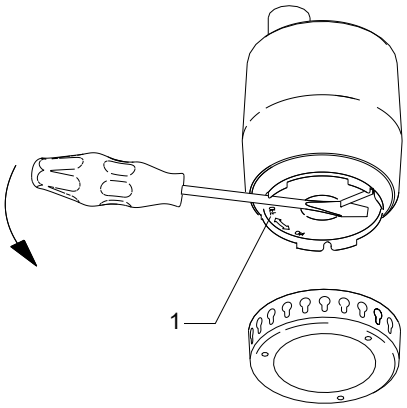
TM034329

Loosening the strainer

4. Remove the inlet strainer, clean, and refit it.

If the pump still does not deliver a sufficient quantity of water, dismantle the pump as follows:

1. Disconnect the power supply.
2. Turn the pump housing 90° counterclockwise using a screwdriver. See the arrow on the pump housing. Pull off the housing. See the figure below.

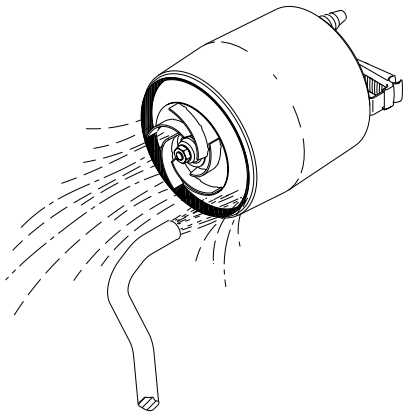


TM031168

Removing the inlet strainer from the pump housing

Pos.	Description
1	Pump housing

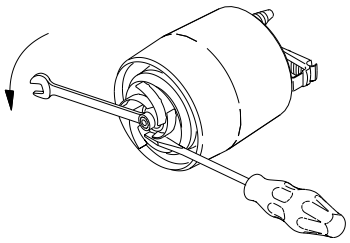
3. Clean and flush the pump with water to remove possible impurities between the motor and the outer pump housing. Clean the impeller. See the figure below.



TM031169

Cleaning the impeller

4. Check that the impeller can rotate freely. If not, remove the impeller:
   - Loosen and remove the nut on the motor shaft (13 mm). Use a screwdriver to prevent the impeller from rotating. See the figure below.
   - Clean the impeller and the area around the shaft.



TM031170

Removing the impeller

5. Check the impeller, the pump housing and the sealing part. Replace possible defective parts.
6. Assemble the pump in reverse order of dismantling.

Check before and when fitting the pump housing that the sealing part is positioned correctly, see fig. Pump components. Moisten the sealing part with water to facilitate the fitting.

Further dismantling of the pump must be carried out by a specially trained person.

Related information

7.3 Replacement of parts

7.2 Contaminated pumps

Any application for service must include details about the pumped liquid.

CAUTION

Biological hazard

Minor or moderate personal injury

- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.

The product will be classified as contaminated if it has been used for a liquid which is injurious to health or toxic.

If you request Grundfos to service the product, contact Grundfos with details about the pumped liquid before returning the product for service. Otherwise Grundfos can refuse to accept the product for service.

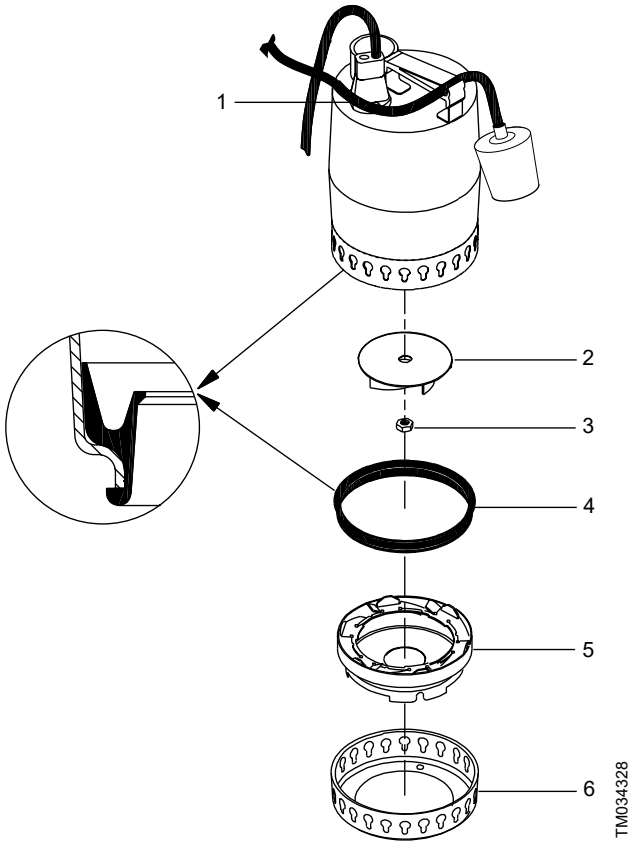
Any application for service must include details about the pumped liquid.

Clean the product in the best possible way before you return it.

Costs of returning the product are to be paid by the customer.

7.3 Replacement of parts

The impeller assembly and power cable can be replaced. The part numbers and the components included in the service kits are found in Grundfos Product Center at www.grundfos.us. Alternatively, contact your local Grundfos dealer or service center.



Pump components

Pos.	Description
1	Power cable
2	Impeller
3	Nut
4	Gasket
5	Pump housing
6	Strainer

8. Fault finding the product

DANGER

Electric shock

Death or serious personal injury

- Switch off the power supply before starting any work on the product. Make sure that the power supply cannot be accidentally switched on.

8.1 The motor does not start.

The motor does not start.

Cause	Remedy
No power supply.	Connect the power supply.
The motor is switched off by the float switch.	Adjust or replace the float switch.
The fuses are blown.	Replace the fuses.
The motor protection or thermal relay has tripped.	Wait until the motor protection trips in again or reset the relay.
The impeller is blocked by impurities.	Clean the impeller. See section Cleaning the pump.
There is a short circuit in the cable or motor.	Replace the defective part.

Related information

7.1 Cleaning the pump

8.2 The motor protection or thermal relay trips after a short time of operation.

The motor protection or thermal relay trips after a short time of operation.

Cause	Remedy
The temperature of the pumped liquid is too high.	Contact your Grundfos representative.
The impeller is blocked or partly blocked by impurities.	Clean the impeller. See section Cleaning the pump.
Phase failure.	Consult an electrician.
The voltage is too low.	Consult an electrician.
The overload setting of the motor-protective circuit breaker is set too low.	Adjust the setting.

Related information

7.1 Cleaning the pump

8.3 The pump runs constantly or gives insufficient water.

The pump runs constantly or gives insufficient water.

Cause	Remedy
The pump is partly blocked by impurities.	Clean the pump. See section Cleaning the pump.
The outlet pipe or valve is partly blocked by impurities.	Clean the outlet pipe or valve.
The impeller is not properly fixed to the shaft.	Tighten the impeller.
The float switch is set incorrectly.	Adjust the float switch setting.
The pump is too small for the application.	Replace the pump.
The impeller is worn.	Replace the impeller.

Related information

7.1 Cleaning the pump

8.4 The pump runs but gives no water.

The pump runs but gives no water.

Cause	Remedy
The pump is blocked by impurities.	Clean the pump. See section Cleaning the pump.
The outlet pipe or check valve is blocked by impurities.	Clean the outlet pipe or the check valve.
The impeller is not properly fixed to the shaft.	Tighten the impeller.
Air is trapped in the pump.	Vent the pump and the outlet pipe.
The liquid level is too low. The inlet strainer is not completely submerged in the pumped liquid.	Submerge the pump's inlet strainer in the liquid or adjust the float switch.
Pumps with float switch: The float switch does not move freely.	Adjust the float switch cable. See section Adjustment of cable length for a float switch.

Related information

4.4 Adjustment of cable length for a float switch

7.1 Cleaning the pump

9. Technical data

The pump can run continuously. Make sure the inlet strainer is covered by the pumped liquid.

See the nameplate on the pump for the electrical and hydraulic performance data.

9.1 Electrical data

Enclosure class

IP68.

Insulation class

F.

9.2 Operating conditions

Liquid temperature

Minimum 32 °F (0 °C).

The maximum liquid temperature depends on the rated voltage of the pump according to the table:

Voltage	Max. liquid temperature
1 x 115 V, 60 Hz	KP 150, KP 250
	122 °F (50 °C) *
	KP 350
	113 °F (45 °C) *

* At intervals of at least 30 minutes, the pump can run for 2 minutes with a liquid temperature of 158 °F (70 °C).

Minimum water level

The water level must be above the inlet strainer.

Maximum installation depth

Maximum 23 ft (7 m) below liquid level.

pH value

Between 4 and 9.

Maximum particle size

0.39 in. (10 mm).

Density

146.88 ounce/gallon (8.24 gram/liter)

Viscosity

Close to the viscosity of water or 1 cSt (1 mm^2/s) at 68 °F (20 °C).

9.3 Storage temperature

Minimum -4 °F (-20 °C).

9.4 Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

A-weighted sound pressure level

< 65 dB(A) in accordance with ISO 3743.

For further technical data, see section Nameplate and Type key.

Related information

6.3.2 Type key

10. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

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