

# Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

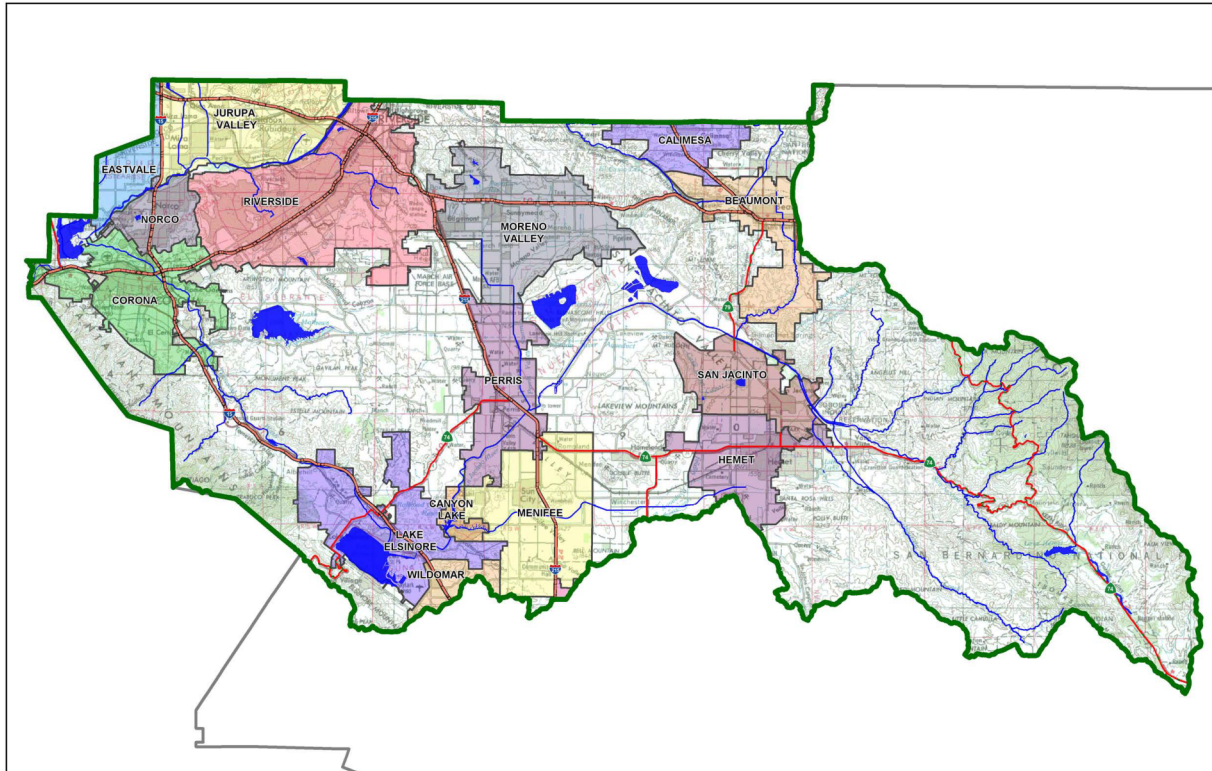
## LEGEND

- BROWN = BUILDING & SAFETY GRADING DIVISION COMMENTS
- PURPLE = PLANNING DEPARTMENT COMMENTS
- GREEN = ENVIRONMENTAL PROGRAMS DEPARTMENT COMMENTS
- LIGHT ORANGE = TRANSPORTATION DEPARTMENT COMMENTS
- BLUE = FLOOD CONTROL DISTRICT COMMENTS
- LIGHT GREEN = REGIONAL PARKS & OPEN SPACE DISTRICT COMMENTS
- RED = FIRE DEPARTMENT COMMENTS
- YELLOW = ENVIRONMENTAL HEALTH DEPARTMENT COMMENTS
- LIGHT BLUE = BUILDING & SAFETY PLAN CHECK COMMENTS
- ORANGE = WASTE MANAGEMENT DEPARTMENT COMMENTS

**Project Title:** Bridge Investment Group (B.I.G.) Patterson Industrial

**Development No:** N/A

**Design Review/Case No:** PPT220024



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- Final

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*Prepared for Compliance with*  
*Regional Board Order No. **R8-2010-0033***

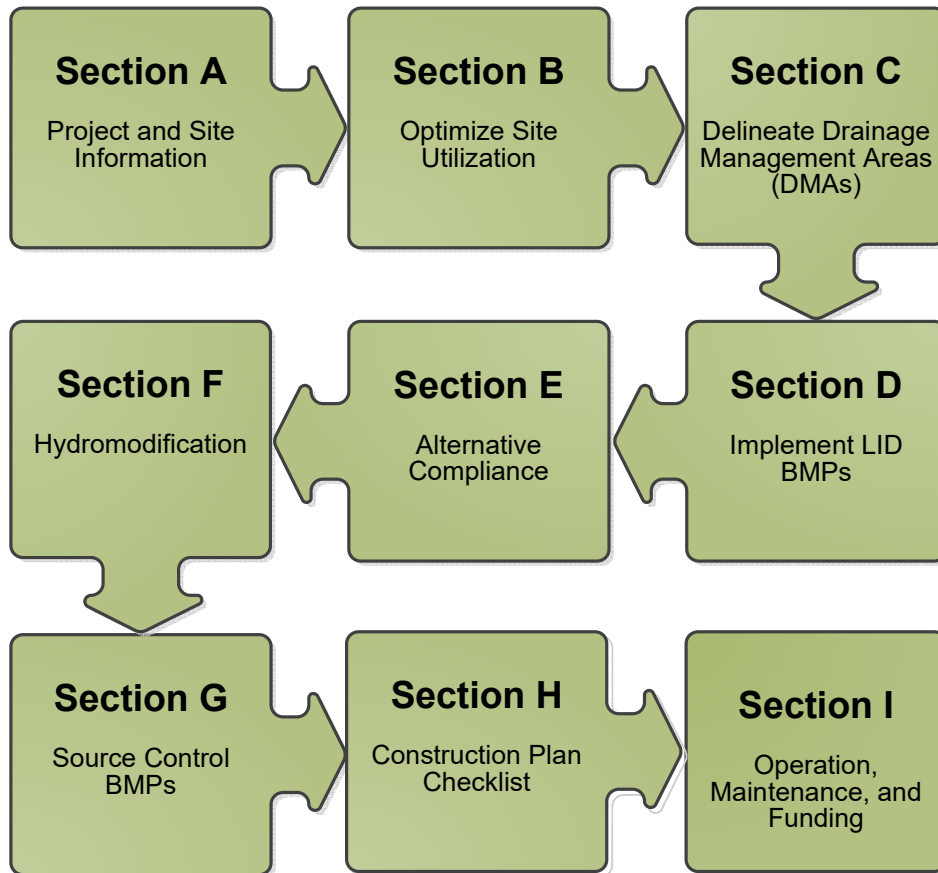
**Template revised June 30, 2016**

**RIVERSIDE COUNTY**  
**TRANSPORTATION DEPT**  
**WQMP**  
**PRELIMINARY**  
**APPROVAL**

Date: 3/6/2023 By: RTebben

## A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your “how-to” manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



## OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Bridge Investment Group for the B.I.G Patterson Industrial project (Case No. PPT220024), located on Patterson Avenue in an unincorporated portion of the County of Riverside, California.

This WQMP is intended to comply with the requirements of Riverside County for County Ordinance No. 754, which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the Riverside County Water Quality Ordinance No. 754.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

\_\_\_\_\_  
Owner's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Owner's Printed Name

\_\_\_\_\_  
Owner's Title/Position

## PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

\_\_\_\_\_  
Preparer's Signature

\_\_\_\_\_  
Date

Nobu Murakami  
\_\_\_\_\_  
Preparer's Printed Name

Water Resources Engineer  
\_\_\_\_\_  
Preparer's Title/Position

Preparer's Licensure:

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## Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Industrial
Planning Area:	Mead Valley Area Plan (MVAP)
Community Name:	County of Riverside – Community of Gavilan Hills
Development Name:	B.I.G. Patterson Industrial
PROJECT LOCATION	
Latitude & Longitude (DMS): 33°50'6.47"N, 117°15'14.03"W	
Project Watershed and Sub-Watershed: Santa Ana (Watershed) Perris Reservoir (Sub Watershed)	
Gross Acres: ~5.2 acres (parcel); drainage management area of ~5.1 acres	
APN(s): 317-140-016 and 317-140-047	
Map Book and Page No.: Map No. 24737	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Light Industrial
Proposed or Potential SIC Code(s)	1541
Area of Impervious Project Footprint (SF)	192,973 SF
Total Area of <u>proposed</u> Impervious Surfaces within the Project Footprint (SF)/or Replacement	192,973 SF
Does the project consist of offsite road improvements?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Does the project propose to construct unpaved roads?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Is the project part of a larger common plan of development (phased project)?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
EXISTING SITE CHARACTERISTICS	
Total area of <u>existing</u> Impervious Surfaces within the Project limits Footprint (SF)	0
Is the project located within any MSHCP Criteria Cell?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Is a Geotechnical Report attached?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	See Appendix 3 – NRCS Soil Types A & C
What is the Water Quality Design Storm Depth for the project?	0.59 inch

Bridge Investment Group is proposing to develop an industrial tilt-up warehouse building and associated parking as part of this project, which is located on Patterson Avenue within an unincorporated portion of the Riverside County, California. A vicinity map is provided in Appendix 1 of this report for reference purpose. Applicable Assessor Parcel Numbers (APNs) are 317-140-016 and 317-140-047. The site is approximately 5.2 acres (parcel gross area) with approximately 5.1 acres of drainage management area. The proposed warehouse building footprint is approximately 107,968 square feet and there will be a total of 82 parking spaces to be provided. The proposed impervious and pervious footprints within the drainage management area are approximately 192,973 square feet and 27,554 square feet, respectively. The project also includes frontage street improvements along frontage Patterson Avenue.

In the existing condition, runoff from the site drains in an easterly direction via sheet-flow towards Patterson Avenue. There is an offsite area to the west and northwest of the project boundary running onto the project. It is our understanding that there is no existing storm drain for connection in the frontage street, Patterson Avenue. As such, runoff from the site sheet-flows easterly towards Patterson Avenue and majority of the runoff appears to travel in southerly direction along Patterson Avenue. A small portion appears to drain northerly towards Cajalco Road. Based on the RCFC&WCD's Perris Valley Master Drainage Plan (MDP), runoff from the

majority of the site is within the MDP subarea "G-1" and intended (tabled) to contribute to the MDP Lateral Line G-1 storm drain system further downstream, beginning just west of I-215. The MDP Lateral Line G-1 continues easterly and connects into the MDP Line G, which drains to the existing District's Perris Valley Storm Drain Channel by Morgan Street. The Perris Valley Storm Drain Channel eventually drains to Canyon Lake and then Lake Elsinore. A small portion of the site in the northeasterly corner is intended to be part of the MDP subarea "E-8", which eventually drains to the MDP Lateral Line E-8 and then MDP Line E-8 along Ramona Expressway and discharges into Perris Valley Storm Drain Channel.

In the post-project condition, the drainage characteristics will be maintained similar as compared to the pre-project condition. The westerly and northwesterly offsite run-on flows will be collected via a network of perimeter v-ditches and catch basins and conveyed/bypassed via proposed storm drain pipes around the site to a catch basin bubbler and surface flow outlet via a proposed sidewalk underdrain to Patterson Avenue. The majority of the post-project on-site flows (from DMA 1) will be directed to a proposed BMP located near the southeasterly corner of the project for flow attenuation and water quality treatment. The proposed BMP will consist of a combination of an underground storage facility (hard-bottom closed system) and a modular wetland system (MWS) for storm water quality treatment based on a volume-based approach. The on-site runoff will be attenuated based on the RCFC&WCD's increased runoff criteria and overflow/mitigated flows are designed to be pumped to the southeasterly landscape/riprap area and outlet to Patterson Avenue via the same sidewalk underdrain mentioned above. To be consistent with the MDP Perris Valley document, runoff from the remaining portion of the site near the northeasterly corner of the site (from DMA 2) will be considered self-treating area and drain to Patterson Avenue via a sidewalk underdrain. Since this drainage management area only includes a self-treating area in this area that is similar in acreage (or slight reduction) as compared to the existing condition, a separate BMP or storage would not be necessary.

In support of the infiltration feasibility for the proposed permanent storm water BMP, the project-specific geotechnical engineer conducted infiltration testing and recommends a field infiltrate rate of 0.3 in/hr. This rate is below the infiltration threshold of 1.6 in/hr; and therefore, infiltration is not feasible for this project. Furthermore, this rate is at or below the threshold for bioretention LID BMP. As such, this would fall under the biotreatment category. Therefore, as indicated above, the project proposes a combination of a proprietary underground storage facility and modular wetland system (MWS), based on the volume-based approach, to address both the flood control increased runoff and storm water quality management plan requirements.

## A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling
- BMP Locations (Lat/Long)

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

## A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

**Table A.1** Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Perris Valley Storm Drain	N/A	N/A	San Jacinto River Rach 3 (downstream).
San Jacinto River Reach 3 – Canyon Lake to Nuevo Road (HU#802.11)	None	MUN, AGR, GWR, REC1, REC2, WARM, WILD, RARE	This river reach has existing or potential RARE beneficial use.
Canyon Lake (HU#802.11, 802.12)	Nutrients, Pathogens <b>TMDL Completed</b> - Nutrients	MUN, AGR, GWR, REC1, REC2, COMM, WARM, WILD	San Jacinto River Reaches 1 (downstream).
San Jacinto River Rach 1 (HU#802.32, 802.31)	None	MUN, AGR, GWR, REC1, REC2, WARM, WILD, RARE	This river reach has existing or potential RARE beneficial use.
Lake Elsinore (HU#802.31)	Nutrients, Organic Enrichment/Low Dissolved Oxygen, PCBs, Toxicity <b>TMDL Completed</b> – Nutrients, Organic Enrichment/Low Dissolved Oxygen	MUN, REC1, REC2, COMM, WARM, WILD, RARE	The lake has existing or potential RARE beneficial use.

Note: Based on the direction from the City, the 2012 impairment listing is referenced.



### A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
US Army Corps of Engineers, CWA Section 404 Permit	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Statewide Construction General Permit Coverage	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Statewide Industrial General Permit Coverage (dependent on tenant)	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Other <i>(please list in the space below as required)</i> County of Riverside – Grading Permit & Building Permit	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

## Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Consideration of "highest and best use" of the discharge should also be considered. For example, Lake Elsinore is evaporating faster than runoff from natural precipitation can recharge it. Requiring infiltration of 85% of runoff events for projects tributary to Lake Elsinore would only exacerbate current water quality problems associated with Pollutant concentration due to lake water evaporation. In cases where rainfall events have low potential to recharge Lake Elsinore (i.e. no hydraulic connection between groundwater to Lake Elsinore, or other factors), requiring infiltration of Urban Runoff from projects is counterproductive to the overall watershed goals. Project proponents, in these cases, would be allowed to discharge Urban Runoff, provided they used equally effective filtration-based BMPs.

### Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

***The existing site drains in an easterly direction towards Patterson Avenue and the drainage pattern will be maintained in the post-project condition.***

Did you identify and protect existing vegetation? If so, how? If not, why?

***The site has little or no existing vegetation as it has been graded and consistently cleared over many years.***

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

***Where applicable, runoff from the proposed hardscape area will be directed towards landscape area in an effort to promote incidental infiltration and preserve the infiltration capacity. Additionally, roof***

***runoff through downspouts will be directed to proposed landscape areas where feasible to help slow down the storm water runoff.***

***In support of the infiltration feasibility for the proposed permanent storm water BMP, the project-specific geotechnical engineer conducted infiltration testing and recommends a field infiltrate rate of 0.3 in/hr. This rate is below the infiltration threshold of 1.6 in/hr; and therefore, infiltration is not feasible for this project.***

Did you identify and minimize impervious area? If so, how? If not, why?

***Impervious areas are only used where necessary and have been minimized to the extent practicable. Parking spaces are minimized close to the required amount and the landscaped areas have been maximized to the extent practicable.***

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

***Runoff from impervious surfaces is directed to the pervious landscape areas where possible to help promote incidental infiltration and evaporation, prior to being directed to the proposed structural BMP for water quality treatment.***

# Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

**Table C.1 DMA Classifications**

DMA Name or ID	Surface Type(s) <sup>12</sup>	Area (Sq. Ft.)	DMA Type
DMA 1-1	Ornamental Landscaping	19,212	Type D
DMA 1-2	Concrete or Asphalt	89,005	Type D
DMA 1-3	Roofs	103,968	Type D
DMA 1-STA	Self-Treating Area	2,068	Type A
DMA 2-STA	Self-Treating Area	6,274	Type A

<sup>1</sup>Reference Table 2-1 in the WQMP Guidance Document to populate this column

<sup>2</sup>If multi-surface provide back-up

**Table C.2 Type 'A', Self-Treating Areas**

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA 1-STA	2,068	Landscaping	Drip
DMA 2-STA	6,274	Landscaping	Drip

**Table C.3 Type 'B', Self-Retaining Areas**

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Name/ ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4	Required Retention Depth (inches)
		[A]	[B]		= [C]	
N/A						

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

**Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas**

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Impervious fraction	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]			[C] = [A] x [B]	[D]
N/A							

**Table C.5 Type 'D', Areas Draining to BMPs**

DMA Name or ID	BMP Name or ID
DMA 1-1	BMP 1 – StormTrap (7'2" SingleTrap) / BMP 1-Modular Wetland System (MWS-L-4-13-9'-7"-V)
DMA 1-2	BMP 1 – StormTrap (7'2" SingleTrap) / BMP 1-Modular Wetland System (MWS-L-4-13-9'-7"-V)
DMA 1-3	BMP 1 – StormTrap (7'2" SingleTrap) / BMP 1-Modular Wetland System (MWS-L-4-13-9'-7"-V)

*Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.*

## Section D: Implement LID BMPs

### D.1 Infiltration Applicability

Is there an approved downstream ‘Highest and Best Use’ for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)?  Y  N

If yes has been checked, Infiltration BMPs shall not be used for the site; proceed to section D.3

If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream ‘Highest and Best Use’ feature.

### Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermitee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document?  Y  N

### Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site...	YES	NO
...have any DMAs with a seasonal high groundwater mark shallower than 10 feet? If Yes, list affected DMAs:		✓
...have any DMAs located within 100 feet of a water supply well? If Yes, list affected DMAs:		✓
...have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact? If Yes, list affected DMAs:		✓
...have measured in-situ infiltration rates of less than 1.6 inches / hour? If Yes, list affected DMAs: DMA 1, DMA 2	✓	
...have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface? If Yes, list affected DMAs:		✓
...geotechnical report identify other site-specific factors that would preclude effective and safe infiltration? Describe here: Clayey materials observed approximately 5’ below existing grade and below and 25’ setback would be needed from structures and retaining walls for infiltration facilities.		✓

If you answered “Yes” to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

## D.2 Harvest and Use Assessment

Please check what applies:

- Reclaimed water will be used for the non-potable water demands for the project.
- Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).
- The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If none of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

### Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

- Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.  
*Total Area of Irrigated Landscape:* Insert Area (Acres)  
*Type of Landscaping (Conservation Design or Active Turf):* List Landscaping Type
- Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.  
*Total Area of Impervious Surfaces:* Insert Area (Acres)
- Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).  
*Enter your EIATIA factor:* EIATIA Factor
- Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.  
*Minimum required irrigated area:* Insert Area (Acres)
- Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

<b>Minimum required irrigated area (Step 4)</b>	<b>Available Irrigated Landscape (Step 1)</b>
Insert Area (Acres)	Insert Area (Acres)

## Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

*Projected Number of Daily Toilet Users: Number of daily Toilet Users*

*Project Type: Enter 'Residential', 'Commercial', 'Industrial' or 'Schools'*

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

*Total Area of Impervious Surfaces: Insert Area (Acres)*

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-2 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

*Enter your TUTIA factor: TUTIA Factor*

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

*Minimum number of toilet users: Required number of toilet users*

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

<b>Minimum required Toilet Users (Step 4)</b>	<b>Projected number of toilet users (Step 1)</b>
Insert Area (Acres)	Insert Area (Acres)

## Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Insert narrative description here.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

*Average Daily Demand: Projected Average Daily Use (gpd)*

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

*Total Area of Impervious Surfaces: Insert Area (Acres)*



Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-4 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

*Enter the factor from Table 2-4: Enter Value*

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of gallons per day of non-potable use that would be required.

*Minimum required use: Minimum use required (gpd)*

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the projected average daily use (Step 1) to the minimum required non-potable use (Step 4).

<b>Minimum required non-potable use (Step 4)</b>	<b>Projected average daily use (Step 1)</b>
Minimum use required (gpd)	Projected Average Daily Use (gpd)

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment per Section 3.4.2 of the WQMP Guidance Document.

### **D.3 Bioretention and Biotreatment Assessment**

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

*Select one of the following:*

- LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).
- A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

**Note: The proposed site will be treated via a combination of proprietary underground storage facility (StormTrap or equivalent) and Modular Wetland System (MWS). The Modular Wetland System is to be located immediately downstream of the proposed underground storage facility (for detention purpose). The proposed facilities have been sized based on the volume-based approach.**

## D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA 1-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DMA 1-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DMA 1-3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

**Note:** As indicated above, based on the recommended infiltration rate by the project-specific geotechnical engineer, infiltration and bioretention are not technically feasible and the suitable BMP is biotreatment LID BMP. Therefore, the proposed site will be treated via a combination of proprietary underground storage facility (StormTrap or equivalent) and Modular Wetland System (MWS). The proposed underground storage facility is designed using a “volume-based” approach to store the minimum required design capture volume and slowly release it within acceptable drawdown time (i.e. – within 48 hours) to the proposed MWS (located immediately downstream) for treatment.

## D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the  $V_{BMP}$  worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required  $V_{BMP}$  using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, $I_f$	DMA Runoff Factor	DMA Areas x Runoff Factor	<i>BMP 1 - StormTrap (7'2" SingleTrap) &amp; Modular Wetland System (MWS-L-4-13-9'7"-V) - Volume-based</i>		
	[A]				[B]			
<i>DMA 1-1</i>	19,212	<i>Ornamental Landscaping</i>	0.1	0.11	2122.1	<i>Design Storm Depth (in)</i>	<i>Design Capture Volume, <math>V_{BMP}</math> (cubic feet)</i>	<i>Proposed Volume on Plans (cubic feet)</i>
<i>DMA 1-2</i>	89,005	<i>Concrete or Asphalt</i>	1.0	0.89	79392.5			
<i>DMA 1-3</i>	103,968	<i>Roofs</i>	1.0	0.89	92739.5			
	$A_T = \Sigma[A] = 212,185$				$\Sigma = [D] = 174254.1$	$[E] = 0.59$	$[F] = \frac{[D] \times [E]}{12} = 8567.5$	$[G] = 33451$

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document.

[E] is obtained from Section 2.3.1 in the WQMP Guidance Document.

[G] is obtained from the proprietary BMP manufacturer (i.e. –StormTrap - SingleTrap).

## Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. **No alternative compliance measures are required for this project and thus this Section is not required to be completed.**

- Or -

The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

**Note: DMA 1 will be treated via a combination of proprietary Modular Wetland Systems (MWS), which is to be located downstream of an underground storage facility (i.e. – StormTrap – SingleTrap).**

## E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

**Table E.1 Potential Pollutants by Land Use Type**

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
<input type="checkbox"/> Detached Residential Development	P	N	P	P	N	P	P	P
<input type="checkbox"/> Attached Residential Development	P	N	P	P	N	P	P	P <sup>(2)</sup>
<input checked="" type="checkbox"/> Commercial/Industrial Development	P <sup>(3)</sup>	P	P <sup>(1)</sup>	P <sup>(1)</sup>	P <sup>(5)</sup>	P <sup>(1)</sup>	P	P
<input type="checkbox"/> Automotive Repair Shops	N	P	N	N	P <sup>(4, 5)</sup>	N	P	P
<input type="checkbox"/> Restaurants (>5,000 ft <sup>2</sup> )	P	N	N	N	N	N	P	P
<input type="checkbox"/> Hillside Development (>5,000 ft <sup>2</sup> )	P	N	P	P	N	P	P	P
<input type="checkbox"/> Parking Lots (>5,000 ft <sup>2</sup> )	P <sup>(6)</sup>	P	P <sup>(1)</sup>	P <sup>(1)</sup>	P <sup>(4)</sup>	P <sup>(1)</sup>	P	P
<input type="checkbox"/> Retail Gasoline Outlets	N	P	N	N	P	N	P	P
<b>Project Priority Pollutant(s) of Concern</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

*P = Potential*

*N = Not Potential*

<sup>(1)</sup> A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

<sup>(2)</sup> A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

<sup>(3)</sup> A potential Pollutant is land use involving animal waste

<sup>(4)</sup> Specifically petroleum hydrocarbons

<sup>(5)</sup> Specifically solvents

<sup>(6)</sup> Bacterial indicators are routinely detected in pavement runoff

## E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage <sup>2</sup>
N/A	
Total Credit Percentage <sup>1</sup>	

<sup>1</sup>Cannot Exceed 50%

<sup>2</sup>Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

## E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I <sub>f</sub>	DMA Runoff Factor	DMA Area x Runoff Factor	BMP Name			
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)	Total Storm Water Credit % Reduction	Proposed Volume or Flow on Plans (cubic feet or cfs)
	A <sub>T</sub> = Σ[A]				Σ = [D]	[E]	[F] = $\frac{[D] \times [E]}{[G]}$	[F] × (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document

[E] is for Flow-Based Treatment Control BMPs [E] = .2, for Volume-Based Control Treatment BMPs, [E] obtained from Exhibit A in the WQMP Guidance Document

[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12

[H] is from the Total Credit Percentage as Calculated from Table E.2 above

[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6.

## E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High:** equal to or greater than 80% removal efficiency
- **Medium:** between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

**Table E.4 Treatment Control BMP Selection**

Selected Treatment Control BMP Name or ID <sup>1</sup>	Priority Pollutant(s) of Concern to Mitigate <sup>2</sup>	Removal Percentage <sup>3</sup>	Efficiency
N/A			

<sup>1</sup> Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

<sup>2</sup> Cross Reference Table E.1 above to populate this column.

<sup>3</sup> As documented in a Co-Permittee Approved Study and provided in Appendix 6.

# Section F: Hydromodification

## F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

**HCOC EXEMPTION 1:** The Priority Development Project disturbs less than one acre. The Copermitttee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption?       Y     N

If Yes, HCOC criteria do not apply.

**HCOC EXEMPTION 2:** The volume and time of concentration<sup>1</sup> of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption?       Y     N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

**Table F.1** Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	Post-condition	% Difference
<b>Time of Concentration</b>	N/A	N/A	N/A
<b>Volume (Cubic Feet)</b>	N/A	N/A	N/A

<sup>1</sup> Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.



**HCOC EXEMPTION 3:** All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Susceptibility Maps.

Does the project qualify for this HCOC Exemption?       Y       N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

## **F.2 HCOC Mitigation**

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

- a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.
- b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.
- c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

**Note: The project is within the Riverside County WAP HCOC Exemption area approved on April 20, 2017.**

## Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and “housekeeping”, that must be implemented by the site’s occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. **Identify Pollutant Sources:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.
2. **Note Locations on Project-Specific WQMP Exhibit:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.
3. **Prepare a Table and Narrative:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.
4. **Identify Operational Source Control BMPs:** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

**Table G.1 Permanent and Operational Source Control Measures**

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Mark all inlets with the words “Only Rain Down the Storm Drain” or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. <sup>3</sup> See applicable operational BMPs in Fact Sheet SC-44, “Drainage System Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>  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 drain.”
Interior floor drains	Interior floor drains shall be plumbed to sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.
Need for future indoor & structural pest control	Building design features including sealants barriers and fully closing windows and doors have been included to discourage entry of pests.	Integrated Pest Management (IPM) information to be provided to owners, lessees, and operators.
Landscape/outdoor pesticide use	Final Landscape Plans will accomplish the following: Preserve existing native 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 stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. Prevent erosion of slopes by planting fast-growing, dense ground covering plants. Plant native vegetation to reduce the amount of water, fertilizers, and pesticides applied to the landscape. Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro-spray systems. Periodically inspect and fix leaks and misdirected sprinklers. Do not rake or blow leaves, clippings, or pruning waste into the street, gutter, or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city’s program. Integrated Pest Management (IPM) information to be provided to owners, lessees, and operators.
Refuse areas	Site design features dumpster enclosures. Signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	Periodic inspections for leaky, overfilled, uncovered, or other problematic conditions will occur. Corrective action will be made upon detection, as circumstances permit. Dumping of liquid or hazardous wastes will be prohibited. Spill control materials will be available on-site. All wastes to properly stored and disposed of in accordance with all applicable Local, State and Federal regulations
Industrial Processes	All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.	All process activities to be performed indoors. No processes to drain to exterior or to storm drain system. See Fact Sheet SC-10, “Non-Stormwater Discharges” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>  See the brochure “Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities” at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a>
Loading Docks	Maintain in a clean and orderly fashion. Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. Provide a roof overhang over the loading area or	Move loaded and unloaded items indoors as soon as possible.  See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

	install door skirts (cowling) at each bay that enclose the end of the trailer.	
Fire Sprinkler Test Water	Provide a means to drain fire sprinkler test water to the sanitary sewer.	See the note in the Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
Miscellaneous Drain or Wash Water or Other Sources	<p>Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.</p> <p>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.</p> <p>Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary.</p> <p>Roofing, gutters, and trim made out of unprotected metals that may leach into runoff shall be avoided.</p>	Inspect periodically to verify that equipment is not leaking or discharging to the storm drain system.
Plazas, Sidewalks, and Parking Lots	Maintain in a clean and orderly fashion.	Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer, not to a storm drain.

## Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

**Table H.1 Construction Plan Cross-reference**

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
BMP 1	BMP 1 / StormTrap Underground Storage Facility and Modular Wetland System (MWS-L-4-13-9'-7"-V)  (Note: to be located downstream of the underground storage facility – StormTrap.)	Precise Grading Plan (Sheet #'s to be determined at the time of FWQMP).	33°49'49.32"N / 117°13'30.46"W

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

## Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

**Maintenance Mechanism:** See Appendix 9

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

Y       N

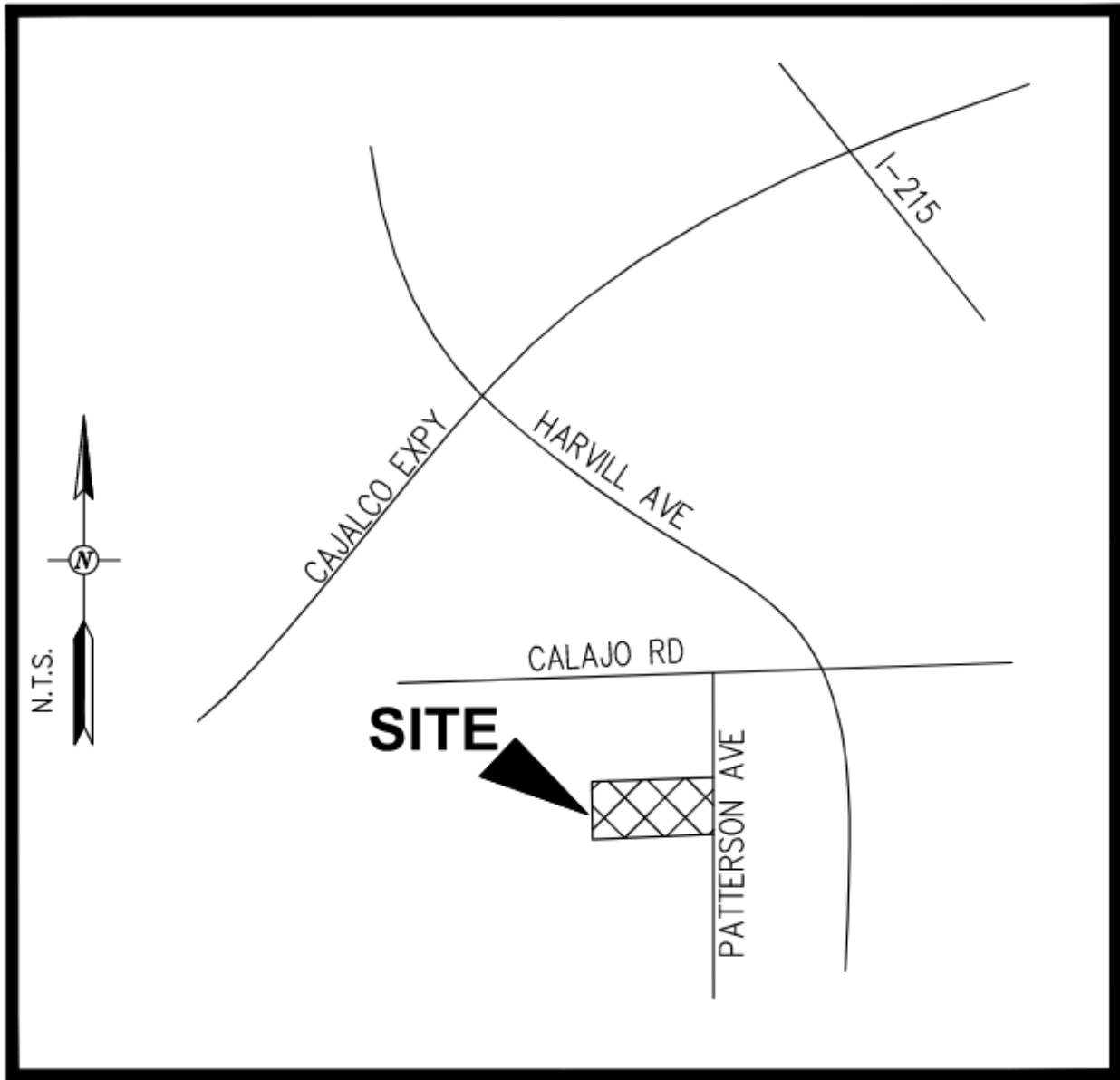
Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

**Note: To be completed at the time of the FWQMP.**

# Appendix 1: Maps and Site Plans

*Location Map, WQMP Site Plan and Receiving Waters Map*

**Vicinity Map**



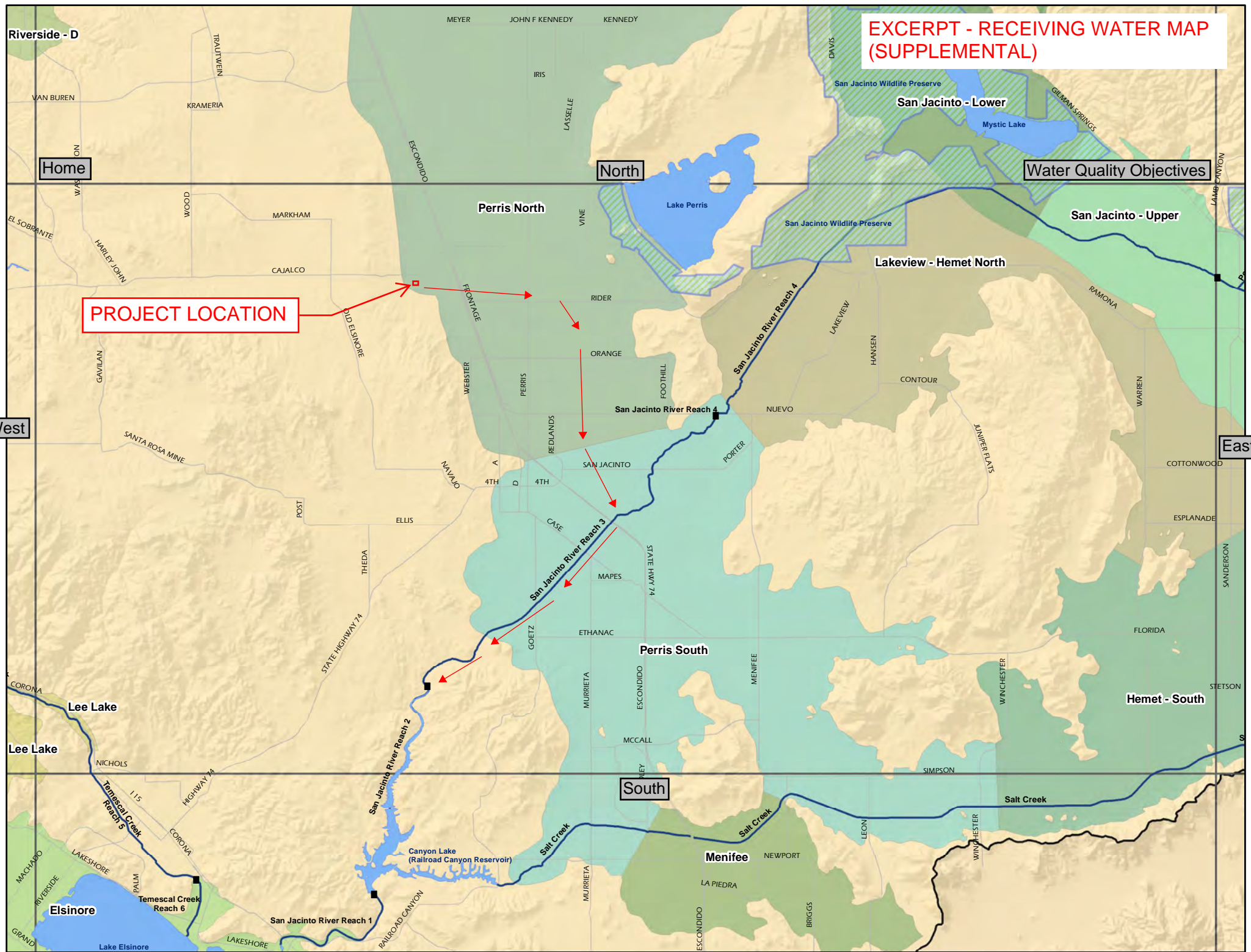
**VICINITY MAP**

NOT TO SCALE

The project is located on Patterson Avenue (west side of Patterson Avenue) in the unincorporated Riverside County, CA.



**EXCERPT - RECEIVING WATER MAP  
(SUPPLEMENTAL)**



**PROJECT LOCATION**

**Water Quality Objectives**

**Home**

**North**

**Perris North**

**San Jacinto - Lower**

**San Jacinto - Upper**

**Lakeview - Hemet North**

**Perris South**

**Hemet - South**

**South**

**Lee Lake**

**Lee Lake**

**Elsinore**

**Menifee**

**Riverside - D**

**West**

**East**

**GENERAL NOTES**

1. THE EXISTING SITE IS AN UNDEVELOPED LAND AND APPEARS TO BE USED FOR A VEHICLE PARKING/STORAGE AREA CURRENTLY. RUNOFF FROM THE EXISTING SITE DRAINS EASTERLY TOWARDS PATTERSON AVENUE. THERE IS ALSO AN OFFSITE RUN-ON FLOW FROM THE WEST SIDE OF THE PROJECT. IT IS OUR UNDERSTANDING THAT THERE IS NO EXISTING STORM DRAIN FOR CONNECTION IN THE FRONTAGE PATTERSON AVENUE.
2. IN THE POST-PROJECT CONDITION, THE DRAINAGE CHARACTERISTICS WILL BE MAINTAINED AS SIMILAR TO THE EXISTING CONDITION. THE MAJORITY OF THE ON-SITE FLOWS WILL BE DIRECTED SOUTHEASTERLY TO A PROPOSED BMP (INCLUDING A FLOOD CONTROL DETENTION STORAGE FACILITY). THE ON-SITE FLOWS WILL BE ATTENUATED AND TREATED BASED ON THE RCF&WCD'S INCREASED RUNOFF CRITERIA AND COUNTY OF RIVERSIDE WQMP GUIDANCE DOCUMENT. THE TREATED FLOW AND OVERFLOW WILL BE PUMPED TO A PROPOSED CATCH BASIN NEAR THE SOUTHEASTERLY CORNER OF THE SITE IN THE LANDSCAPE AREA AND ALLOW IT TO "BUBBLE" OUT OF THE CATCH BASIN AND DRAIN IN THE SOUTHEASTERLY DIRECTION TOWARDS PATTERSON AVENUE VIA A SIDEWALK UNDERDRAIN. THIS OFFSITE RUN-ON WILL BE COLLECTED BY A PROPOSED PERIMETER DITCH ON THE WEST AND SOUTHERLY EDGES OF THE PROJECT AND CONVEYED AROUND THE SITE TO PATTERSON AVENUE VIA THE SAME SIDEWALK UNDERDRAIN. THERE IS A SMALL SELF-TREATING AREA (LANDSCAPE AREA) AT THE NORTHEASTERLY CORNER OF THE SITE THAT DRAINS DIRECTLY TOWARDS PATTERSON AVENUE VIA ANOTHER SIDEWALK UNDERDRAIN.
3. BASED ON THE WEB SOIL SURVEY (ONLINE RESOURCE), THE PROJECT CONSISTS OF HYDROLOGIC SOIL GROUPS A AND C (PRIMARILY GROUP C). BASED ON THE SITE-SPECIFIC INFILTRATION TESTING BY THE GEOTECHNICAL ENGINEER, THE SOILS CONSIST OF VERY STIFF TO HARD CLAYEY SANDS AND THE RECOMMENDED FIELD INFILTRATION RATE IS 0.3 INCH/HOUR. THIS RATE IS BELOW THE INFILTRATION FEASIBILITY THRESHOLD RATE OF 1.6 IN/HR. BASED ON THE INFORMATION PROVIDED, IT WAS DETERMINED THAT THE INFILTRATION IS NOT SUITABLE. ADDITIONALLY, THIS RATE IS EVEN AT OR BELOW THE THRESHOLD FOR BIOTRETENTION AND WOULD BE CATEGORIZED AS BIOTRETMENT. THEREFORE, THE PROPOSED BMP ("BMP 1") WAS DESIGNED TO HAVE A COMBINATION OF AN UNDERGROUND STORAGE FACILITY AND PROPRIETARY MODULAR WETLAND SYSTEM (MWS), USING THE VOLUME-BASED APPROACH, TO TREAT THE ON-SITE FLOWS.
4. THE PROJECT IS SITUATED WITHIN THE FEMA ZONE X; THEREFORE, PROCESSING THROUGH FEMA IS NOT EXPECTED TO BE REQUIRED FOR THIS PROJECT.
5. PRELIMINARY DETAILS FOR TRASH ENCLOSURE WITH COVER, STENCIL, AND ROOF DRAIN OUTLET LOCATION ARE PROVIDED ON THIS EXHIBIT; HOWEVER, THOSE DETAILS COULD BE REFINED FURTHER AT THE TIME OF FINAL WQMP.

**PERMANENT SOURCE CONTROL BMPs**

- 1 - MARK ALL INLETS WITH THE WORDS "ONLY RAIN DOWN THE STORM DRAIN" OR SIMILAR
- 2 - ENCLOSED REFUSE AREA WITH SIGNS POSTED NEARBY STATING "DO NOT DUMP HAZARDOUS MATERIALS HERE" OR SIMILAR
- 3 - LANDSCAPING DESIGNED TO MINIMIZE IRRIGATION AND RUNOFF, TO PROMOTE SURFACE INFILTRATION WHERE APPROPRIATE, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER POLLUTION.

**OPERATIONAL SOURCE CONTROL BMPs**

- MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES
- PREVENT EROSION OF SLOPES BY PLANTING FAST-GROWING, DENSE GROUND COVERING PLANTS
- PLANT NATIVE VEGETATION TO REDUCE THE AMOUNT OF WATER, FERTILIZERS, AND PESTICIDES APPLIED TO THE LANDSCAPE
- DO NOT OVERWATER
- USE IRRIGATION PRACTICES SUCH AS DRIP IRRIGATION, SOAKER HOSES OR MICRO-SPRAY SYSTEMS
- PERIODICALLY INSPECT AND FIX LEAKS AND MISDIRECTED SPRINKLERS.
- DO NOT RAKE OR BLOW LEAVES, CLIPPINGS, OR PRUNING WASTE INTO THE STREET, GUTTER OR STORM DRAIN
- DISPOSE OF GREEN WASTE BY COMPOSTING, HAULING IT TO A PERMITTED LANDFILL, OR RECYCLING IT THROUGH YOUR CITY'S PROGRAM
- PROVIDE IPM INFORMATION TO NEW OWNERS, LESSEES AND OPERATORS
- PERIODIC INSPECTIONS FOR LEAKY, OVERFILLED, UNCOVERED, OR OTHER PROBLEMATIC CONDITIONS WILL OCCUR
- CORRECTIVE ACTION WILL BE MADE UPON DETECTION, AS CIRCUMSTANCES PERMIT
- DUMPING OF LIQUID OR HAZARDOUS WASTES WILL BE PROHIBITED
- SPILL CONTROL MATERIALS WILL BE AVAILABLE ON-SITE
- MOVE LOADED AND UNLOADED ITEMS INDOORS AS SOON AS POSSIBLE
- SWEEP PLAZAS, SIDEWALKS, AND PARKING LOTS REGULARLY TO PREVENT ACCUMULATION OF LITTER AND DEBRIS
- COLLECT DEBRIS FROM PRESSURE WASHING TO PREVENT ENTRY INTO THE STORM DRAIN SYSTEM
- COLLECT WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER AND DISCHARGE TO THE SANITARY SEWER (NOT TO THE STORM DRAIN)

**LID OPPORTUNITIES**

1. PRESERVE EXISTING PERVIOUS AREA WHERE POSSIBLE.
2. LANDSCAPED AREAS DESIGNED TO BE SELF-RETAINING WHERE FEASIBLE.

**DRAINAGE MANAGEMENT AREAS (DMAs):**

**DMA 1**

- DMA 1-1 (ORNAMENTAL LANDSCAPING) - DMA TYPE D - 19,212 S.F.
- DMA 1-2 (CONCRETE OR ASPHALT) - DMA TYPE D - 89,005 S.F.
- DMA 1-3 (ROOFS) - DMA TYPE D - 103,968 S.F.
- DMA 1-STA (SELF-TREATING AREA) - DMA TYPE A - 2,068 S.F.

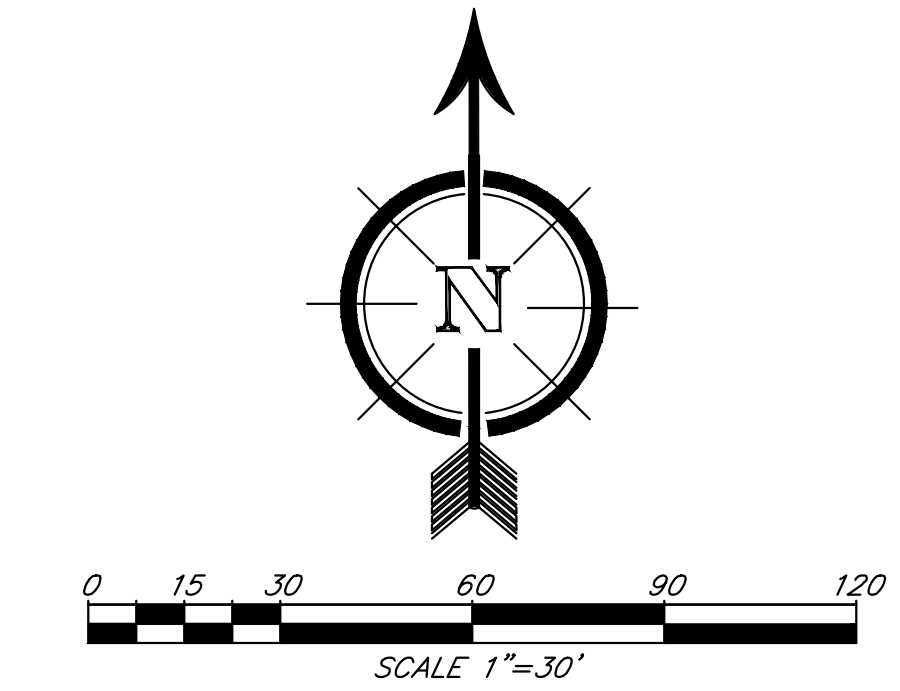
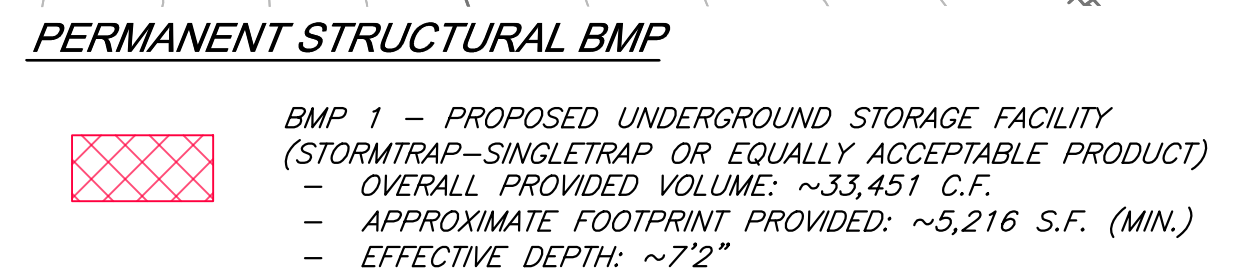
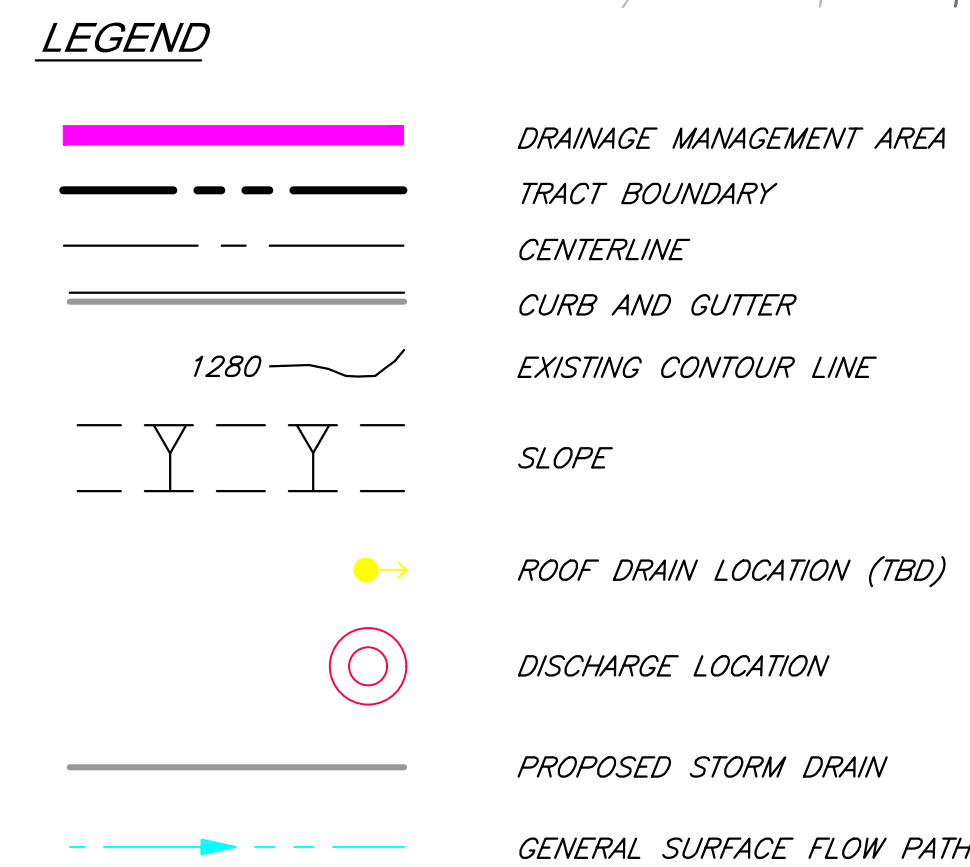
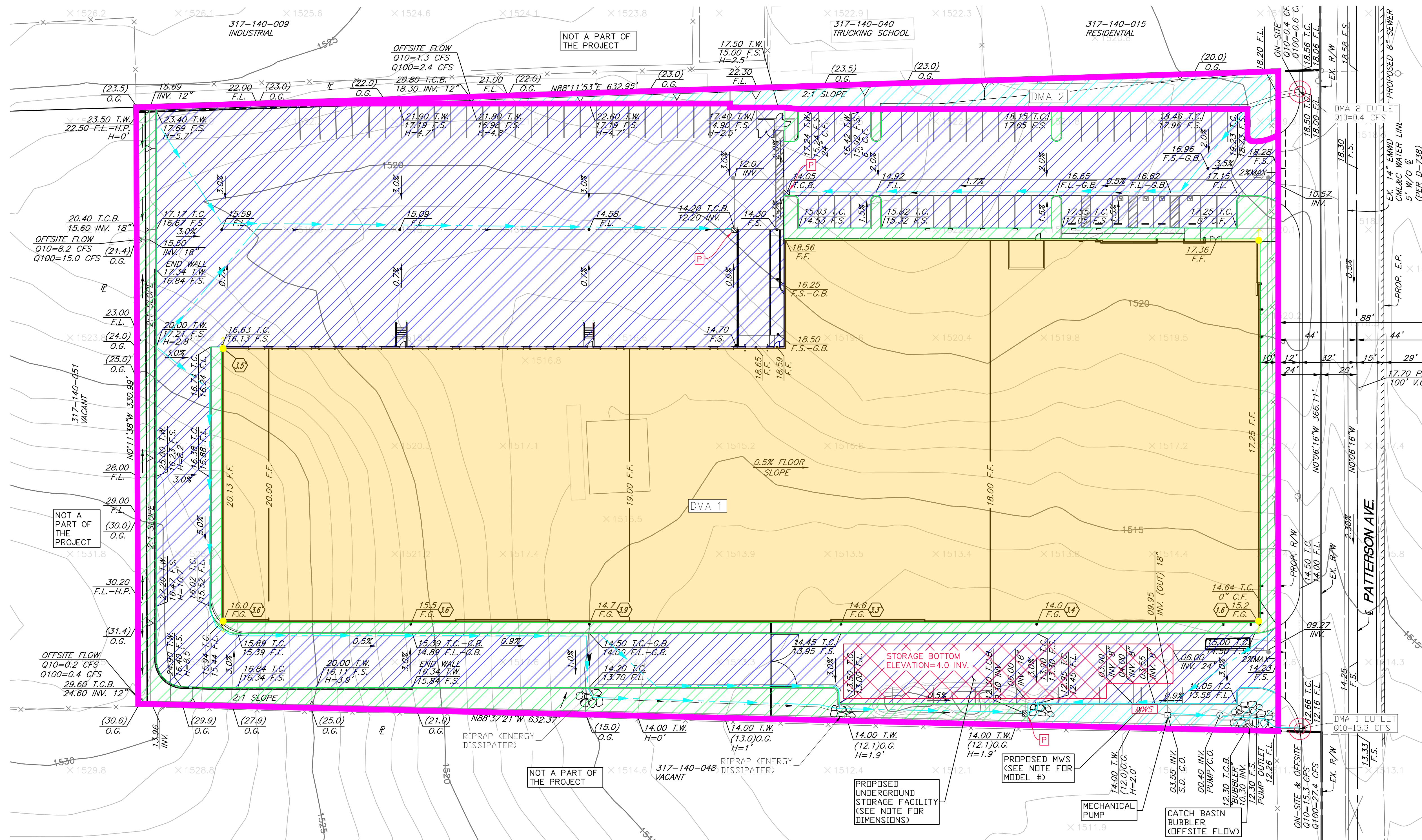
TOTAL DRAINAGE AREA = 214,253 S.F.

**DMA 2**

- DMA 2-STA (SELF-TREATING AREA) - DMA TYPE A - 6,274 S.F.

TOTAL DRAINAGE AREA = 6,274 S.F.

# POST-CONSTRUCTION BMP SITE PLAN BRIDGE INVESTMENT GROUP (B.I.G.) PATTERSON INDUSTRIAL



COUNTY OF RIVERSIDE POST-CONSTRUCTION BMP SITE PLAN B.I.G.-PATTERSON INDUSTRIAL (CASE #: PPT220024) (WEST OF PATTERSON AVENUE)		1 OF 3 SHEETS
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NOT FOR CONSTRUCTION - THIS POST-CONSTRUCTION BMP SITE PLAN IS FOR WQMP REVIEW PURPOSE

# POST-CONSTRUCTION BMP SECTION DETAILS BRIDGE INVESTMENT GROUP-PATTERSON

<b>STRUCTURAL DESIGN LOADING CRITERIA</b> LIVE LOADING: AASHTO HS-20 HIGHWAY LOADING GROUND WATER TABLE: BELOW INVERT OF SYSTEM SOIL BEARING CAPACITY: 3000 PSF SOIL DENSITY: 120 PCF EQUIVALENT UNSATURATED LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT. EQUIVALENT SATURATED LATERAL ACTIVE EARTH PRESSURE: 60 PSF / FT. (IF WATER TABLE PRESENT) APPLICABLE CODES: AASHTO 18.1 BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS	<b>STORMTRAP SYSTEM INFORMATION</b> WATER STORAGE PROV: 33,450.83 CUBIC FEET UNIT HEADROOM: 7'-2" SINGLETRAP	<b>SITE SPECIFIC DESIGN CRITERIA</b> 1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS. 2. COVER RANGE: MIN. 0.78" MAX. 2.78" CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS. 3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION. 4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP. 5. SYSTEM DESIGN MAY ALLOW FOR INCIDENTAL LEAKAGE AND WILL NOT BE SUBJECT TO LEAKAGE TESTING.	<b>StormTrap</b> 1207 MIDWAY PARKWAY RENO, NV 89446 (775) 784-6447 / (775) 784-6447 <b>ENGINEER INFORMATION:</b> SDH & ASSOCIATES 27363 VIA INDUSTRIA TEMECULA, CA 92590 951.683.3691 <b>PROJECT INFORMATION:</b> B.I.G. - PATTERSON RIVERSIDE COUNTY, CA CURRENT ISSUE DATE: 3/29/2022 ISSUED FOR: PRELIMINARY SCALE: NTS SHEET TITLE: SINGLETRAP DESIGN CRITERIA SHEET NUMBER: <b>1.0</b>
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**BMP 1 - STORMTRAP - 7'-2" SINGLETRAP (CLOSED BOTTOM) - TYP.**  
NOT TO SCALE

<b>SITE SPECIFIC DATA</b> PROJECT NUMBER: 15181 PROJECT NAME: BRIDGE I.G. PATTERSON PROJECT LOCATION: RIVERSIDE, CA STRUCTURE ID: BMP 1 TREATMENT REQUIRED: FLOW BASED (CFS): N/A VOLUME BASED (CF): 8613 TREATMENT HGL AVAILABLE (FT): N/A PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE: OFFLINE PIPE DATA: INLET PIPE 1: 3.90 HOPE 8" INLET PIPE 2: N/A N/A N/A OUTLET PIPE: 3.55 HOPE 8" PRE-TREATMENT: BIOFILTRATION DISCHARGE: DISCHARGE RM ELEVATION: 13.20 13.20 13.20 SURFACE LOAD: PEDESTRIAN N/A PEDESTRIAN FRAME & COVER: 430" OPEN PLANTER #214 WETLANDMEDIA VOLUME (CY): 7.22 ORIFICE SIZE (DIA. INCHES): #1.71" NOTES: PRELIMINARY NOT FOR CONSTRUCTION.	<p><b>PLAN VIEW</b></p>	<p><b>LEFT END VIEW</b></p>	<p><b>RIGHT END VIEW</b></p>
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<b>INSTALLATION NOTES</b> 1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT. 2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS. 3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED W/EPDM GASKETS PER MANUFACTURER'S STANDARD CONNECTION DETAIL. 4. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE. 5. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS. 6. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE. <b>GENERAL NOTES</b> 1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED. 2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.	<p><b>ELEVATION VIEW</b></p>	<p><b>REQUIRED TREATMENT VOLUME (CY):</b> 8613  <b>DRAWDOWN DURATION (HOURS):</b> 36  <b>AVERAGE DISCHARGE RATE PER MWS UNIT (GPM):</b> 30.14  <b>OPERATING HEAD (FT):</b> 6.3  <b>WETLANDMEDIA INFILTRATION RATE (IN/HR):</b> 26  <b>WETLANDMEDIA LOADING RATE (GPM/SF):</b> 0.26</p>
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**MWS-L-4-13-9'-7"-V**  
STORMWATER BIOFILTRATION SYSTEM  
STANDARD DETAIL

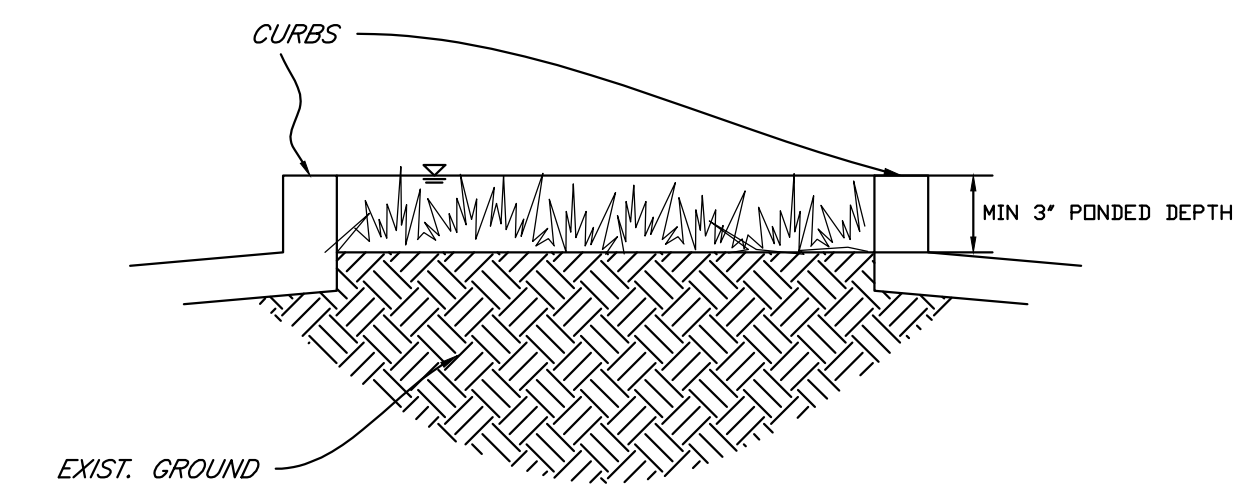
**BMP 1 - MODULAR WETLAND SYSTEM (MWS) DETAIL - MWS-L-4-13-9'-7"-V**  
NOT TO SCALE

**GENERAL NOTES**

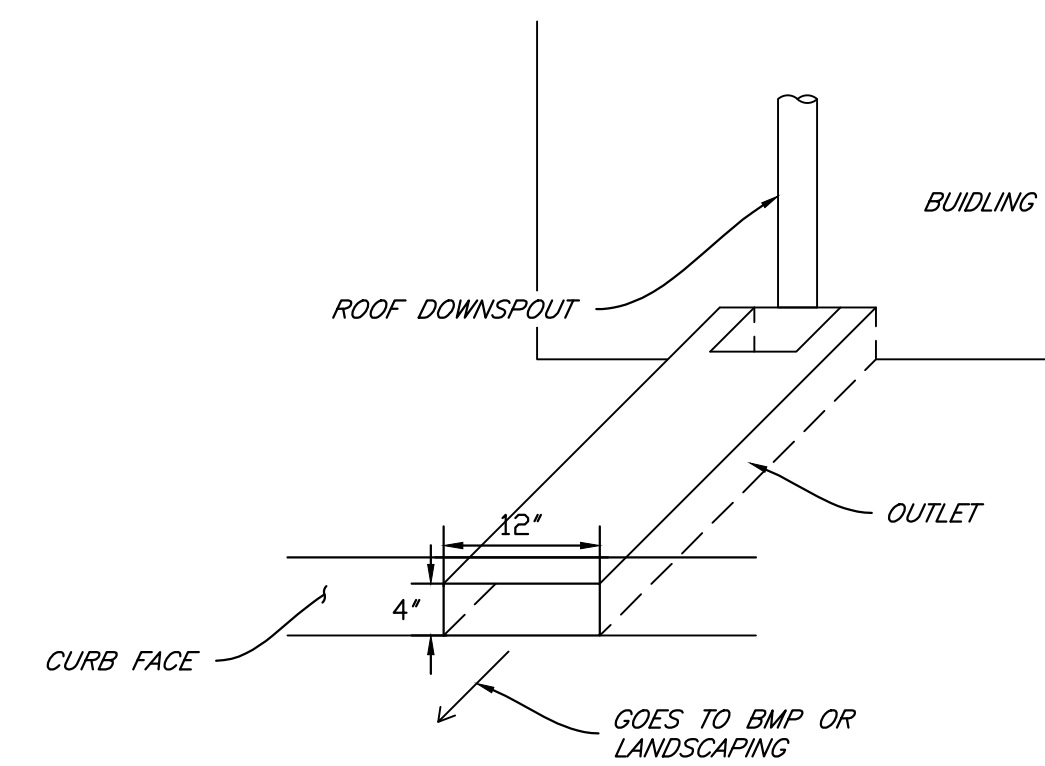
1. THE PROPOSED UNDERGROUND STORAGE FACILITY ("STORMTRAP-SINGLETRAP") SECTION DETAIL IS PROVIDED ON THIS SHEET. ALL THE OTHER PERTINENT DETAILS ASSOCIATED WITH THE PROPOSED STORMTRAP ARE INCLUDED AS PART OF THE PWQMP.
2. FOR BMP 1, THE PROPOSED MODULAR WETLAND SYSTEM (MWS) (DETAILS SHOWN ON THIS SHEET) WILL BE PROVIDED IMMEDIATELY DOWNSTREAM OF THE PROPOSED UNDERGROUND FACILITY AND HAS BEEN SIZED USING THE VOLUME-BASED APPROACH.
3. A MECHANICAL PUMP WILL BE PROVIDED DOWNSTREAM OF THE PROPOSED "BMP 1". A PRELIMINARY CUT SHEET DETAIL FOR THE PROPOSED MECHANICAL PUMP IS PROVIDED ON SHEET 3. THE DETAIL IS EXPECTED TO BE REFINED FURTHER AT THE TIME OF FINAL WQMP.
4. THE PROPOSED LANDSCAPING/PLANTING (PLANT PALETTE) IS TO BE PROVIDED SEPARATELY BY THE PROJECT LANDSCAPE ARCHITECT.



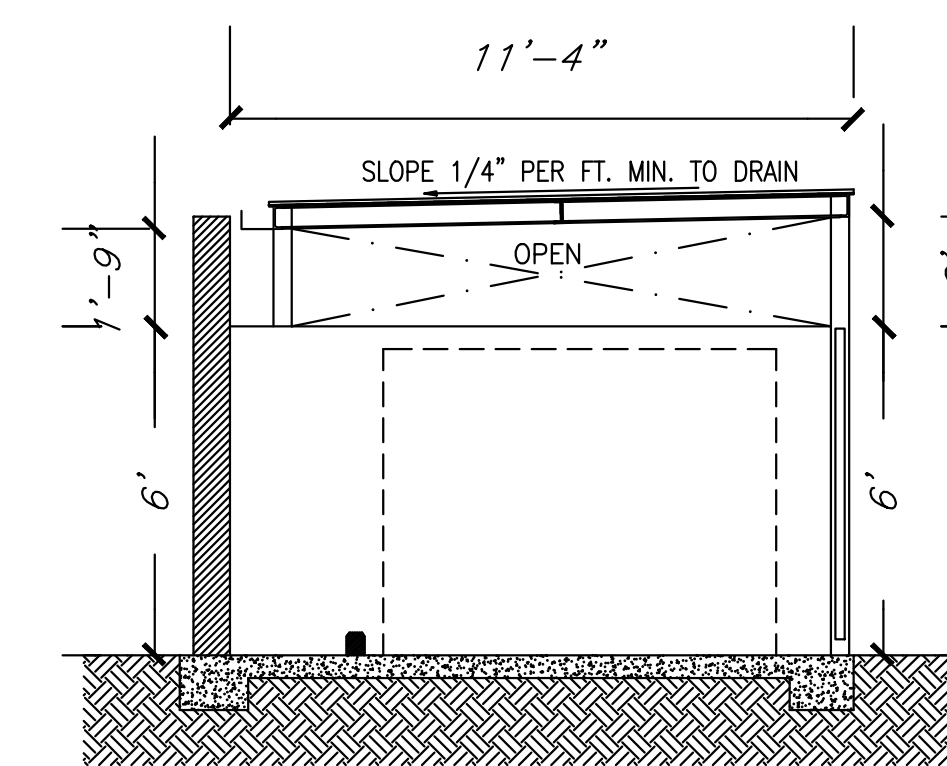
**INLET PLACARD DETAIL (TYP.)**  
NOT TO SCALE



**LANDSCAPED ISLAND DETAIL (TYP.)**  
NOT TO SCALE



**ROOF DRAIN CURB OUTLET STRUCTURE DETAIL (TYP.)**  
NOT TO SCALE



**TRASH ENCLOSURE STRUCTURE DETAIL (TYP.)**  
NOT TO SCALE

**CONNECTOR PIPE SCREEN (CPS)**  
L 27

CPS L WITH 2.7 FT SCREEN LENGTH	CPS HEIGHT (IN)	SCREEN FLOW (CFS)
12	3.84	
18	7.06	
24	10.88	
30	15.20	
36	19.92	

NOTE: BYPASS FLOW RATES VARY WITH VAULT DEPTH AND BYPASS HEIGHT. CONTACT BIO CLEAN FOR ADDITIONAL INFORMATION.

GENERAL NOTES:  
 1. BIO CLEAN TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.  
 2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS, AND CAPACITIES ARE SUBJECT TO CHANGE.  
 3. THIS CPS UNIT IS DESIGNED FOR TREATMENT FLOWS THROUGH THE SCREEN FLOWS GREATER THAN THE TREATMENT FLOW RATE WILL BYPASS OVER THE SCREEN.  
 4. A BYPASS LID IS REQUIRED WHEN THE OUTLET PIPE IS DIRECTLY BELOW THE CURB OPENING.  
 5. CPS IS COMPOSED OF 304 STAINLESS STEEL. THICKNESS IS 16 GAUGE. SCREEN PERFORATIONS ARE 5 MILLIMETERS IN DIAMETER. THE SCREEN AREA IS 51% OPEN SPACE.

INSTALLATION NOTES:  
 1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS REQUIRED TO INSTALL THE CPS UNIT AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.  
 2. POSITION THE CPS SO IT IS EXACTLY SPACED AROUND THE CONNECTOR PIPE, ENSURING A MIN. OF 4" SPACING AWAY FROM ANY CORNERS. SCREEN BOTTOM SHALL BE FLUSH WITH THE CATCH BASIN FLOOR, OR WITH GAPS NO GREATER THAN 3 MM.  
 3. IF A BYPASS LID IS REQUIRED, VERIFY THE BYPASS HEIGHT NEEDED AND MARK THAT LOCATION ON THE WALL DIRECTLY ABOVE THE BASE APPROX. LEFT THE LID IN PLACE AND MARK THE HOLE LOCATIONS FOR THE LID MOUNTING BRACKETS. SECURE THE LID WITH STAINLESS STEEL NUTS.

BARRANTY: 3 YEAR MANUFACTURER'S BIO CLEAN ENVIRONMENTAL SERVICES, INC. 508 VA EL CENTRAL, OCEANOGRAPHY, CA 92038 PHONE: 760-433-7840 DATE: 1/17/2020 DRAFTER: G.M.S.	MEETS FULL CAPTURE REQUIREMENTS REVISIONS: [ ] DATE: [ ] REVISIONS: [ ] DATE: [ ] REVISIONS: [ ] DATE: [ ] SCALE: NTS UNITS: INCHES	<b>BioClean</b> A Forterra Company
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**PRE-TREATMENT: PROPRIETARY CONNECTOR PIPE SCREEN (CPS) - TYP.**  
NOT TO SCALE

REVISED: AUGUST 2022

COUNTY OF RIVERSIDE POST-CONSTRUCTION BMP SECTION DETAILS		2 OF
B.I.G.-PATTERSON INDUSTRIAL (CASE #: PPT220024) (WEST OF PATTERSON AVENUE)		3 SHEETS

# POST-CONSTRUCTION BMP SECTION DETAILS

## BRIDGE INVESTMENT GROUP-PATTERSON

### PACKAGED PUMP LIFT STATION B.I.G PATTERSON INDUSTRIAL

Furnish and install complete pre-packaged duplex Lift Station model #PSI-SDH081822 as manufactured by Pacific Southwest Industries (national phone # 800-358-9095)

This pre-packaged Lift Station shall incorporate a quick removal system manufactured by the pump manufacturer. The pump(s) shall be guided to the discharge base elbow by a single or double guide rail and shall be stainless steel and shall extend from the discharge base elbow to the upper guide bracket mounted on 1-5/8" x 1-5/8" channel strut just below the basin cover. Stainless steel lifting chain or cable shall be supplied and properly installed to remove the pump from the wet well. The internal discharge piping shall be completely pre-plumbed with pressure rated schedule 40 or 80 PVC pipe as indicated and extend 12" beyond the wet well and valve vault side wall for contractor connection to the force main piping. The pump(s) discharge piping shall have a check and ball valve installed on each pump discharge. The Lift Station shall include control panel and level control floats. The control panel shall be suitable for surface mounting or free standing on a leg kit if the site conditions require it.

#### PUMP DESIGN:

Pump(s) shall be AF SERIES capable of handling raw unscreened sewage, consisting of water, fibrous materials without clogging. All exposed hardware shall be stainless steel. The volute, impeller, seal plates and motor housing shall be constructed of high quality ASTM 48 Class 30 cast iron. The pump (s) shall be capable of handling liquids with temperatures to 120 degrees F. The Pump(s) motor shaft shall be 420 stainless steel supported by a lower Single roll ball bearing and an upper single roll ball bearing. All mating parts shall be machined and sealed with Buna-N O-rings.

#### POWER CABLE:

The pump shall be equipped with 30' of power cord. The ground wire shall be longer than the motor leads such that the ground connections are the last to be broken or pulled apart. The pump cable shall be epoxy filled only around pumps leads to prevent water from entering the pump housing through the power cable. Epoxy is made into power cable from the manufacturer with a cable grommet. The submersible pump shall be supplied with 30 or 50 feet of a multi-conductor cord of type SOOWX. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code.

#### COOLING SYSTEM:

Forty through sixty horsepower will be supplied with an adequately designed cooling system. The cooling jacket shall surround the stator housing providing heat dissipation of the motor. For pumps not submerged (dry pit) liquid shall be supplied to the cooling jacket from a fresh water source.

#### SHAFT SEALS:

Each pump shall be equipped with (3) seals. The lower seal shall be silicon carbide faces. The upper seal shall be of Carbon/Ceramic. The third seal shall be located between the lower seal and the impeller (Lip Seal) to prevent stringy material from entering lower seal.

#### MOTOR CONSTRUCTION:

The motor shall be Air filled water tight chamber and be capable of continuous operation underwater to a depth of 100 feet. The motor shall be designed for continuous duty and non-overloading throughout the entire pump curve. The motor is air filled, class F insulated, NEMA B design. At maximum load the winding temperature shall not exceed 120 degrees C while not submerged. Oil filled motors shall not be considered equal. Pump motors shall have an internal thermal overload device mounted on the windings which may or may not connect to a motor control relay located in the control panel.

#### IMPELLER:

The impeller shall be of ASTM-48 Class 35 gray cast iron and shall be of enclosed channel design. The impeller shall have a slip fit onto the motor shaft and drive key and secured to the shaft by a stainless steel bolt.

#### BEARINGS AND SHAFT:

Upper and lower ball bearings shall be required. The bearings shall be a sealed single ball / race type bearing. Bearings that are lubricated by the same oil that is in the oil filled motors will not be accepted. Both bearings shall have a 65,000 hour life rating. The motor shaft shall be made of 420 stainless steel.

#### QUICK REMOVAL SYSTEM:

The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. The need for a protective coating shall not be required. A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection. Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel. Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump(s).

#### FIBERGLASS WET WELL:

The fiberglass wet well with an anti-floatation flange shall have the proper diameter and depth below the lowest inlet to promote proper cycling while maintaining the rim at grade. The fiberglass wet well shall be manufactured using a process that is filament wound and/or chopped spray. The wet well shall be constructed with an anti floatation flange. Lifting lugs shall be required for those wet wells 48 inches in diameter and larger for setting of the wet well. The laminate shall have a Barco hardness of at least 90% of the resin manufacturer's minimum specified hardness for cured resin on both the interior and exterior surfaces. The minimum wall thickness of the wet well shall not be less than 1/4". Stainless steel studs will be encapsulated in the bottom of the wet well to allow the mounting of the quick removal system. The top rim flange will be a minimum of 2" wide to allow for the installation of the pedestrian rated aluminum cover to the rim flange or shall be rimless if the cover is specified for H2O off street locations. The wet well shall be provided with "unseal" fittings that can be installed in the field to insure proper elevation of the inlet, vent, and electrical on the side of the wet well. The wet well will house 2 - swing check valves, and 2 - shut off valves.

#### COVER(S)

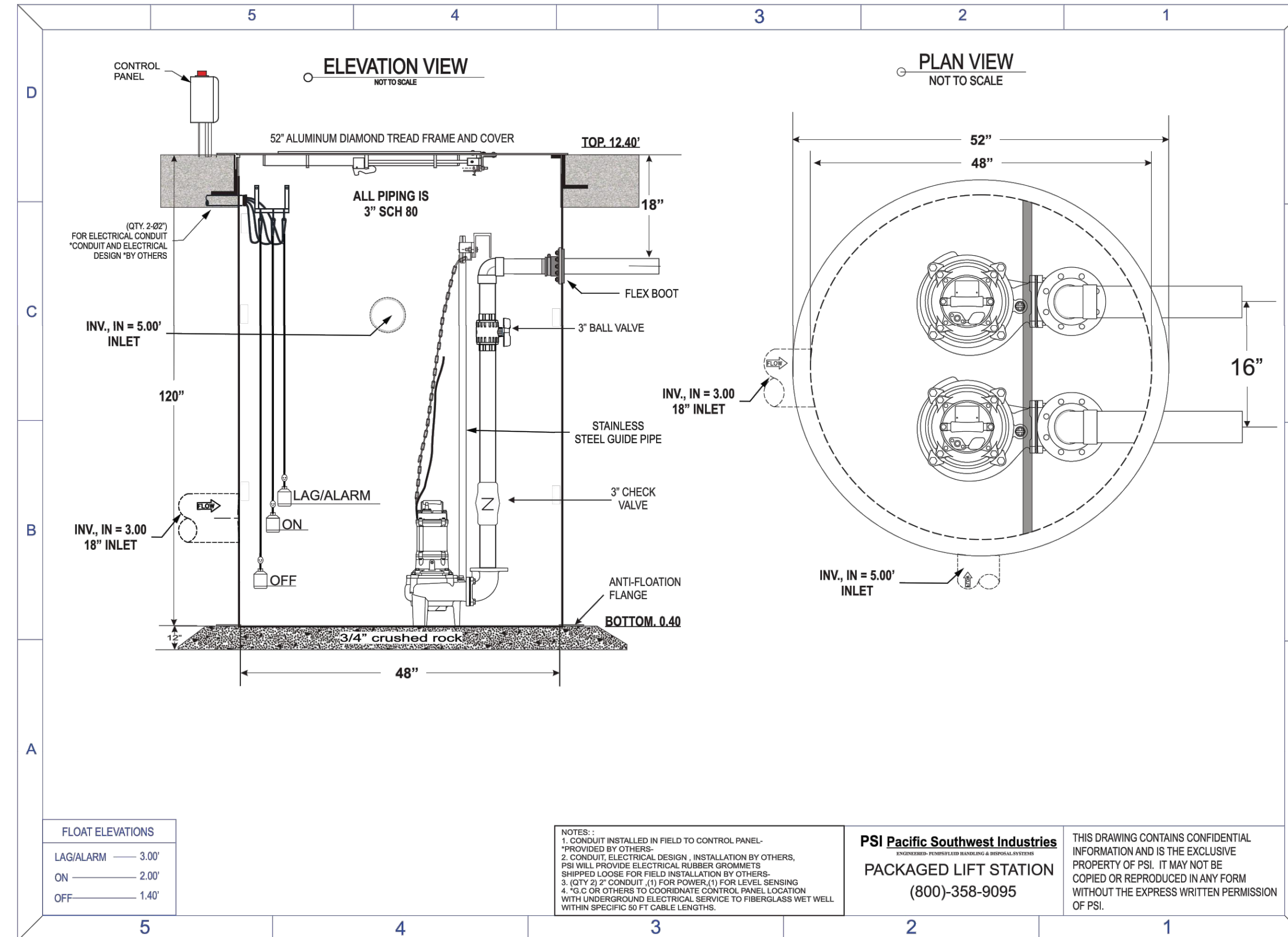
The wet well cover shall always be gasketed and bolted to the rim flange of the fiber glass tank using 7/16" stainless steel hex head bolts unless the cover is to be in a H2O off street location. The type of material to be used for the cover shall be as indicated on this plan sheet.

#### DUPLEX ALTERNATING CONTROL PANEL:

The duplex control panel, as a minimum, shall include the appropriate enclosure type for the environment it is to be installed in and should include the following: Motor starters, motor circuit protectors or variable frequency drives (VFD), pump run indicator(s), operation selector switch(es), high water alarm and light, silence switch, dry contact for alarm, numbered terminals for all incoming power, pump motor(s) and level controls. The control panel shall be UL listed 508 or 913.

The following options marked "x" shall be included and specific for this site.

NEMA 4X  NEMA 3R  LEG KIT  ETM's  SEAL FAIL  THERMAL CUTOUTS  PHASE LOSS MONITOR  SOFT START  GENSET HOOKUP  DOOR IN DOOR DEAD FRONT  THROUGH DOOR MAIN DISCONNECT  TRANSDUCER OPERATED  FLOAT BACKUP  CURRENT CENSOR  AUTO DIALER  REDUNDANT OFF  INTRINSICALLY SAFE  SMART RELAY WHICH INCLUDES EXERCISER, RUN COUNT, ALARM COUNT AND FLOAT POSITION



HCP PUMP		FILE NO. PC-FY-EG-80AFLZ1.5
PUMP PERFORMANCE CURVES		
MODEL	80AFLZ1.5	VER. NO. A10709
STANDARD SPECIFICATION		REFERENCE SPECIFICATION
FREQUENCY	60 Hz	
DISCHARGE	3 inch / 80 mm	HP kW
OUTPUT	2 HP / 1.5 kW	
HEAD	26 FT	
CAPACITY	105 GPM	
PHASE/VOLTAGE	1 Ø 208 V 220 V 230 V	Ø V
RATED CURRENT	10.4 A 10.0 A 9.8 A	A
POLE / rpm	2 P / 3440 rpm	
START METHOD	CAPACITOR	
INSULATION CLASS	F	
REMARK		

HAZEN-WILLIAMS EQUATION/HEAD LOSS IN WATER PIPE	
$C = 0.2083 (100 / c)^{1.49} / dh^{4.75}$	140 HDPE / PVC
$q^m$	143 GPM
$dh^m$	3" SCH 80 = 2.90
3" FRICTION LOSS PER 100 FT =	6.17
$c^m$	140 HDPE / PVC
$q^m$	143 GPM
$dh^m$	4" SCH 80 = 3.83
4" FRICTION LOSS PER 100 FT =	1.59
Velocity (ft/s)	3.98

PSI Pacific Southwest Industries  
PACKAGED LIFT STATION  
(800)-358-9095

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### LIFT STATION DETAILS

PSI Pacific Southwest Industries  
1881 COLLEEN AVE., LANE ELMHURST, CA 94525  
PH: 925-388-9095

Description	Date	No.
LIFT STATION DETAILS B.I.G PATTERSON INDUSTRIAL	08/18/22	DM
Scale: NTS		
Sheet No.		1 OF 1
Drawn by:		
Checked by:		

LSD-1

PROPRIETARY MECHANICAL PUMP (DOWNSTREAM OF BMP) - TYP.  
NOT TO SCALE

REVISED: AUGUST 2022

POST-CONSTRUCTION BMP SECTION DETAILS  
B.I.G.-PATTERSON INDUSTRIAL  
(CASE #: PPT220024)  
(WEST OF PATTERSON AVENUE)

3  
OF  
3  
SHEETS

NOT FOR CONSTRUCTION – THIS POST-CONSTRUCTION BMP SITE PLAN IS FOR WQMP REVIEW PURPOSE

# Appendix 2: Construction Plans

*Grading and Drainage Plans*

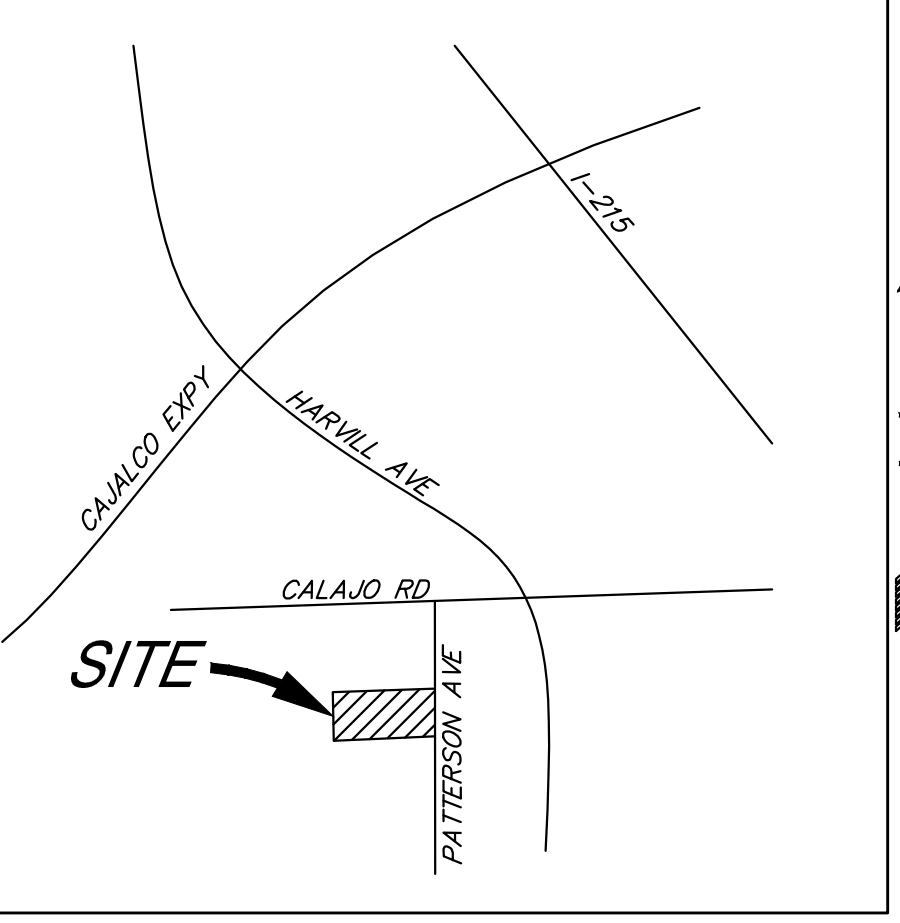
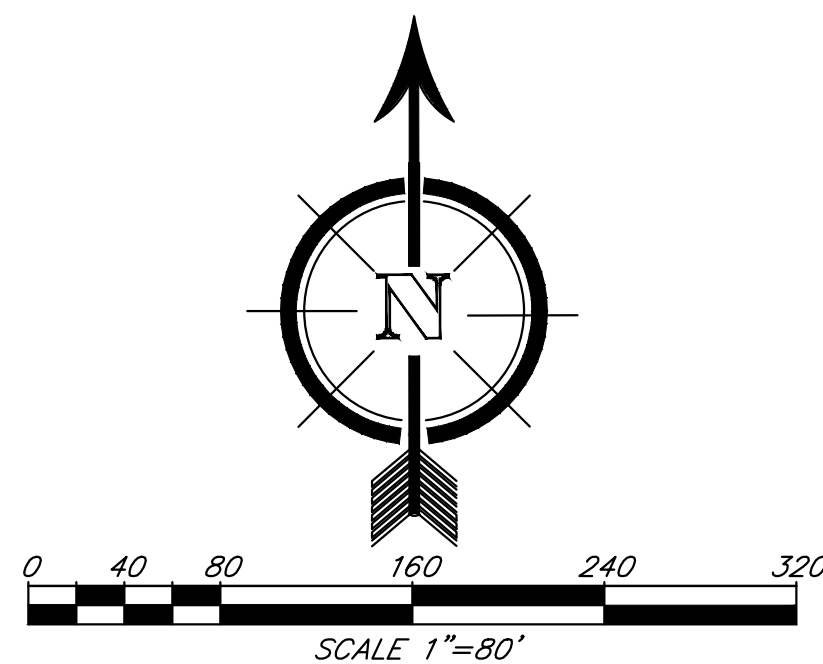
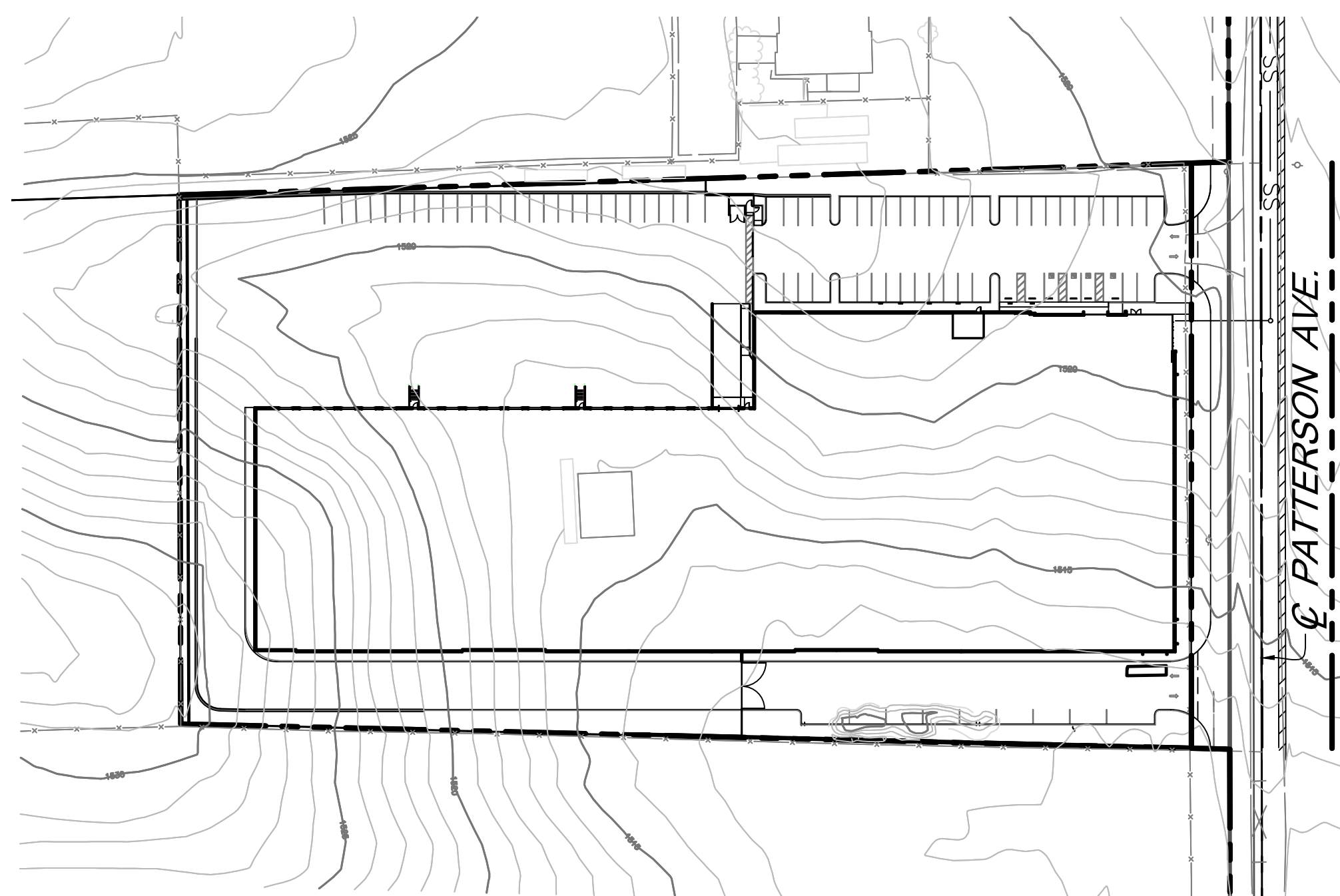
**Note: Preliminary site plans are provided.**

IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

# PRELIMINARY GRADING PLAN

## B.I.G. PATTERSON INDUSTRIAL

T.4S, R.4W, SEC. 12SW  
SDH & ASSOCIATES, INC.  
AUGUST 2022



VICINITY MAP  
NOT TO SCALE

**OWNER/APPLICANT**  
BRIDGE INVESTMENT GROUP  
2000 ALAMEDA DE LAS PULGAS, STE 160  
SAN MATEO, CA 94403  
VOICE: (408) 889-1633  
ATTN: BOB CLOSE

**ENGINEER**  
SDH & ASSOCIATES, INC  
27363 VIA INDUSTRIA  
TEMECULA, CA 92590  
VOICE: (951) 683-3691

**TOPOGRAPHY SOURCE**  
AERIAL PHOTOGRAMMETRY PERFORMED BY:  
ARROWHEAD MAPPING  
PHONE: (909) 889-2420

**ARCHITECT**  
HERDMAN ARCHITECTURE + DESIGN  
16201 SCIENTIFIC WAY  
IRVINE, CA 92618  
VOICE: (714) 389-2800

**EARTHWORK**  
CUT: 12,660 C.Y.  
FILL: 12,660 C.Y.

**UTILITY PURVEYORS**  
WATER: EASTERN MUNICIPAL WATER DISTRICT  
GAS: SO CAL GAS  
ELECTRICAL: SCE  
TELEPHONE: VERIZON  
SEWER: EASTERN MUNICIPAL WATER DISTRICT

**PROJECT DATA**  
SITE AREA: 229,225 S.F. (5.26 AC.)  
NET AREA: 220,432 S.F. (5.06 AC.)  
BUILDING AREA: 107,968 S.F.

**PARKING INFO**  
PARKING REQUIRED: 82 SPACES  
PARKING PROVIDED: 82 SPACES

**FEMA FLOOD ZONE DESIGNATION**  
OUTSIDE FLOODPLAIN, REVIEW NOT REQUIRED

**ZONING AND LAND USE**  
EXISTING ZONING: M-SC  
EXISTING LAND USE: TRUCK STORAGE  
PROPOSED ZONING: M-SC  
PROPOSED LAND USE: INDUSTRIAL

**THOMAS BROTHERS INFO.**  
PAGE: 777, GRID: D3

**WATER QUALITY**  
A PROJECT SPECIFIC WQMP HAS BEEN PREPARED FOR THIS PROJECT

**ZONING DISTRIC**  
NORTH PERRIS AREA

**APN:**  
317-140-016, 317-140-047

**SCHOOL DISTRICT**  
VAL VERDE UNIFIED

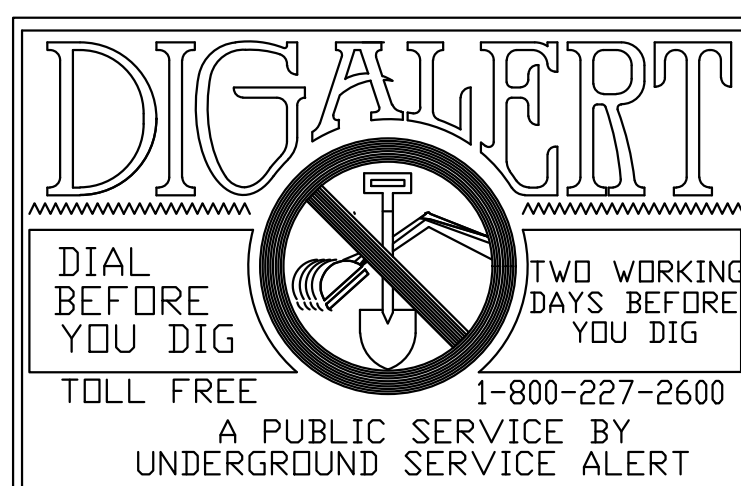
**SHEET INDEX**  
SHEET 1: TITLE SHEET  
SHEET 2: PRELIMINARY GRADING PLAN  
SHEET 3: SECTIONS AND DETAILS

- LEGEND**
- T.C.B. - TOP CATCH BASIN
  - F.G. - FINISHED GRADE
  - F.L. - FLOW LINE
  - H.P. - HIGH POINT
  - EXIST. - EXISTING
  - P.E. - PAD ELEVATION
  - G.B. - GRADE BREAK
  - - STEM WALL HEIGHT
  - TRACT BOUNDARY
  - - - CENTERLINE
  - ==== CURB AND GUTTER
  - ~ 1280 ~ EXISTING CONTOUR LINE
  - LOT LINE
  - - - SLOPE

**CONSTRUCTION NOTES**

- 1 CONSTRUCT 3" A.C. OVER 4" A.B. PAVEMENT DRIVE AND PARKING AREAS
- 2 CONSTRUCT 6" CURB ONLY
- 3 CONSTRUCT 6" CURB AND AND GUTTER
- 4 CONSTRUCT 4" PCC SIDEWALK (FINISH PER LANDSCAPE PLANS)
- 5 CONSTRUCT 24" CATCH BASIN W/ TRAFFIC GRATE (BROOKS 2424 CB OR EQUAL)
- 6 CONSTRUCT 3' WIDE CONCRETE RIBBON GUTTER
- 7 CONSTRUCT TRASH ENCLOSURE (PER ARCHITECTURAL PLAN)
- 8 CONSTRUCT COMMERCIAL DRIVEWAY APPROACH
- 9 CONSTRUCT 5'X5' RIP RAP PAD 6" DIAMETER ROCK EMBEDDED 3" NON GROUTED
- 10 CONSTRUCT RETAINING WALL PER SEPARATE PERMIT (ARCH. PLANS)
- 11 CONSTRUCT COMMERCIAL DRIVEWAY APPROACH
- 12 CONSTRUCT 10' WIDE RIBBON GUTTER
- 13 CONSTRUCT DEEPENED FOOTING
- 14 CONSTRUCT STORM DRAIN CLEANOUT AND ADJUST TOP TO FINISHED GRADE (USE TRAFFIC RATED GRATE IN PAVED AREAS)
- 15 CONSTRUCT 12" HDPE DRAIN PIPE
- 16 CONSTRUCT 18" HDPE DRAIN PIPE
- 17 CONSTRUCT PARKWAY DRAIN
- 18 CONSTRUCT UNDERGROUND STORAGE FACILITY (STORMTRAP - CLOSED BOTTOM)
- 19 CONSTRUCT 1.5" GAP IN CURB FOR DRAINAGE CONVEYANCE
- 20 CONSTRUCT 2' WIDE 1' DEEP CONCRETE "V" DITCH
- 21 CONSTRUCT 12" LANDSCAPE AREA DRAIN
- 22 CONSTRUCT BUBBLER TO SURFACE OUTLET OFFSITE FLOW (WITH 4" LOW-FLOW HDPE DIRECTED TO PUMP)
- 23 CONSTRUCT CMP RISER
- 24 CONSTRUCT 8" HDPE DRAIN PIPE
- 25 CONSTRUCT ADA COMPLIANT HANDICAP RAMP
- 26 CONSTRUCT MODULAR WETLAND SYSTEM (MWS-L-4-13-9'-7"-V)
- 27 CONSTRUCT MECHANICAL PUMP TO SURFACE-OUTLET FLOWS TO LANDSCAPE/RIPRAP AREA
- 28 CONSTRUCT 4" PVC OUTLET PIPE FROM PUMP
- 29 CONSTRUCT 5' WIDE 1.25' DEEP CONCRETE "V" DITCH
- 30 CONSTRUCT ~12'X25' RIPRAP ENERGY DISSIPATER IN LANDSCAPE AREA

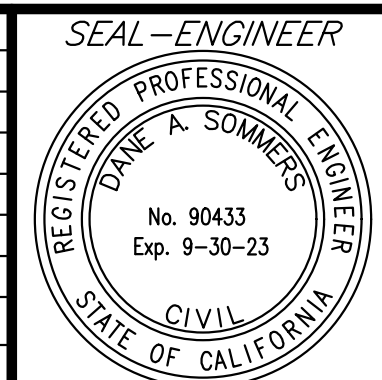
**PRELIMINARY**  
**NOT FOR CONSTRUCTION**



**NOTE:**  
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

The private engineer signing these plans is responsible for assuring the accuracy and acceptability of the design hereon. In the event of discrepancies arising after county approval or during construction, the private engineer shall be responsible for determining an acceptable solution and revising the plans for approval by the county.

MARK	BY	DATE	REVISIONS	APPR.	DATE



ENGINEERING COMPANY  
**SDH ASSOCIATES INCORPORATED**  
SDH AND ASSOCIATES INC.  
27363 VIA INDUSTRIA  
TEMECULA, CA 92590  
TEL: (951) 683-3691 FAX: (951) 788-2314

PREPARED BY: DANE SOMMERS  
R.C.E. NO. 90433  
DATE 9-30-23

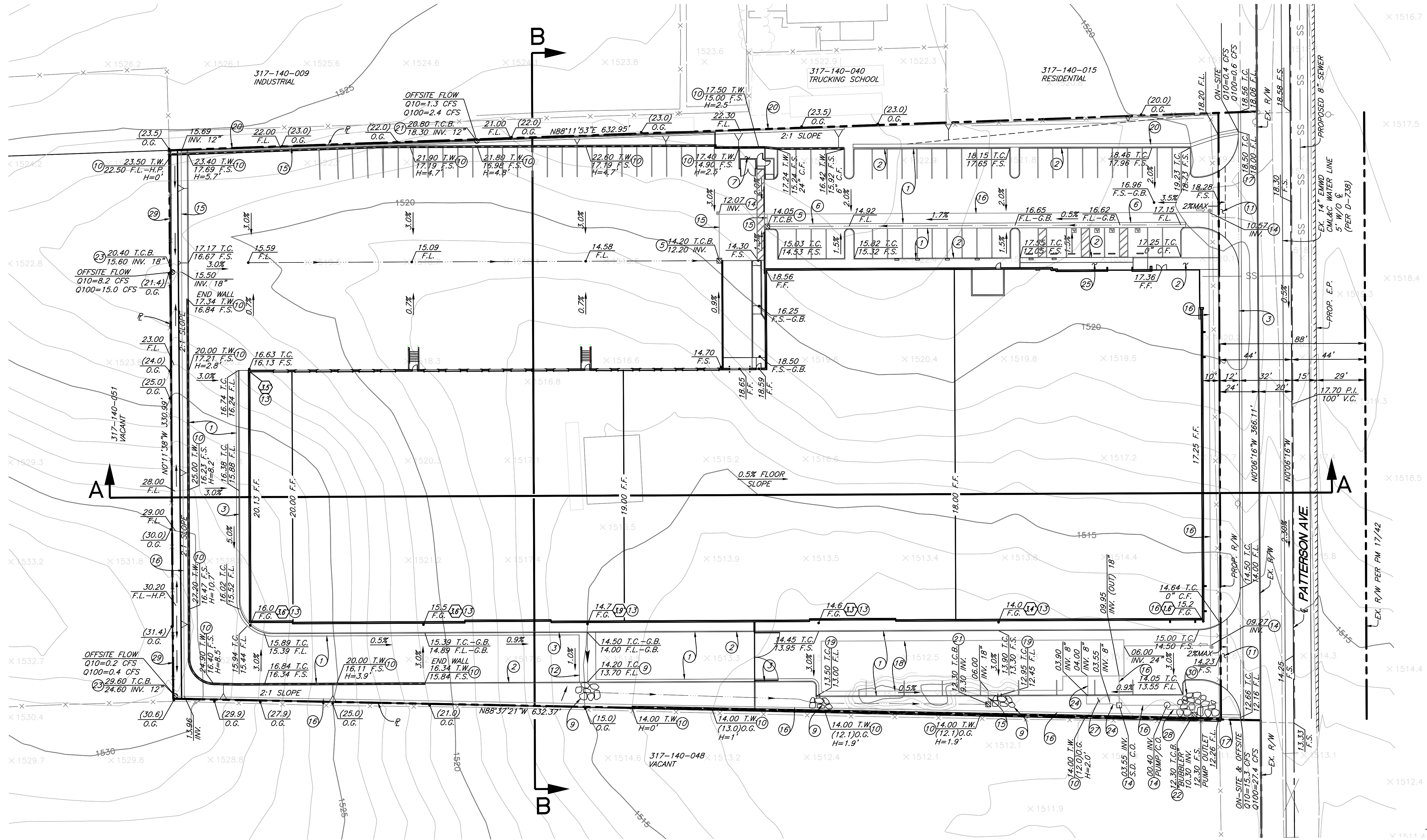
**BENCHMARK:**  
NCS DESIGNATION #435 (PID 045442) ELEV=1515.12' (NVD 786)  
DESCRIBED BY METRO WATER DISTRICT SD, CALIFORNIA 1992 PERRIS, 1300 FEET (E8R.2 M) WEST OF AT&T PALMSIDE ALONG RIDGE ST. ON TOP OF NORTH CURB FACE OF RIDGE ST. 28 FEET (E8.5 M) NORTH OF RIDGE ST. 6 FEET (1.8 M) SOUTH OF A ONE TELEPHONE BOX (DOWNGRADED). A STANDARD 3/4" ALUMINUM DSI SET FLUSH IN TOP OF CURB.

SCALE: H: 1"=80' V: N/A

PPT220024  
B.I.G. PATTERSON INDUSTRIAL  
PRELIMINARY GRADING PLAN  
TITLE SHEET

FOR: W.O. COUNTY FILE NO.

SHEET NO. 1  
1 OF 3 SHTS



**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

**DIG ALERT**  
DIAL BEFORE YOU DIG  
TWO WORKING DAYS BEFORE YOU DIG  
TOLL FREE 1-800-227-2600  
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

**NOTE:**  
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

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MARK	BY	DATE	REVISIONS	APPR.	DATE

SEAL-ENGINEER  
REGISTERED PROFESSIONAL ENGINEER  
DANE A. SOMMERS  
No. 90433  
Exp. 9-30-23  
CIVIL  
STATE OF CALIFORNIA

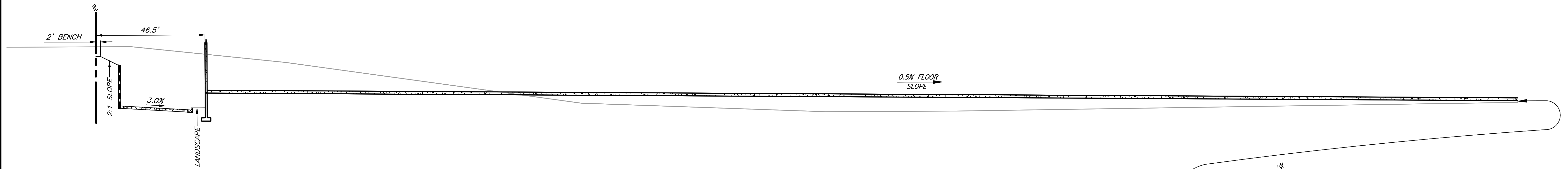
ENGINEERING COMPANY  
**SDH ASSOCIATES**  
SDH AND ASSOCIATES INC.  
27363 VIA INDUSTRIA  
TAMECULA, CA 92550  
TEL: (951) 683-3691 FAX: (951) 788-2314

PREPARED BY:  
DANE A. SOMMERS  
R.C.E. NO. 90433  
DATE 9-30-23

BENCHMARK:  
NCS DESIGNATION #435 (PID 025442) ELEV=1515.12' (NVD 788)  
DESCRIBED BY METRO WATER DISTRICT SD, CALIFORNIA 1992 PERMS.  
1300 FEET CORNER 20 WEST OF AT&T RAILROAD ALONG RIDER ST. ON  
TOP OF NORTH CURB FACE OF RIDER ST. 28 FEET (8.5 M) NORTH  
OF RIDER ST. 6 FEET (1.8 M) SOUTH OF A ONE TELEPHONE BOX  
(MARKED). A STANDARD 3/4" ALUMINUM DISK SET FLUSH IN TOP  
OF CURB.  
SCALE:  
H: 1"=30' V: N/A

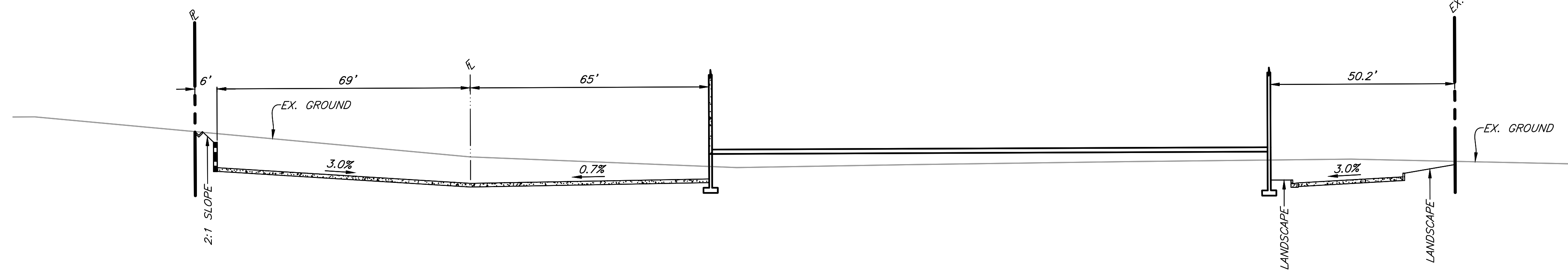
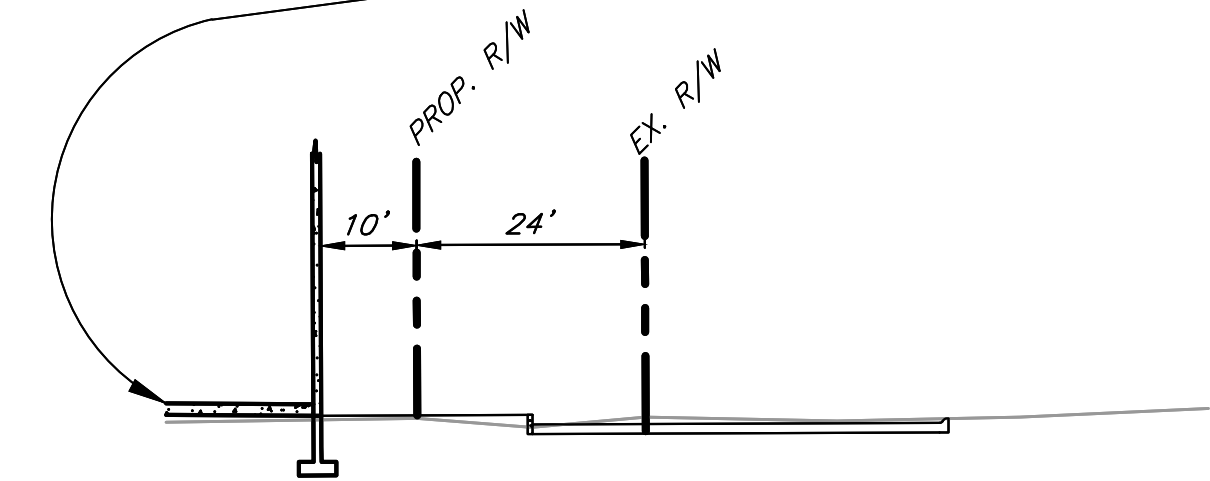
PPT220024  
B.I.G. PATTERSON INDUSTRIAL  
PRELIMINARY GRADING PLAN  
FOR: W.O. COUNTY FILE NO.

SHEET NO. 2  
2 OF 3 SHTS



**SECTION A-A**

1"=20' HORIZONTAL  
1"=10' VERTICAL



**SECTION B-B**

1"=20' HORIZONTAL  
1"=10' VERTICAL

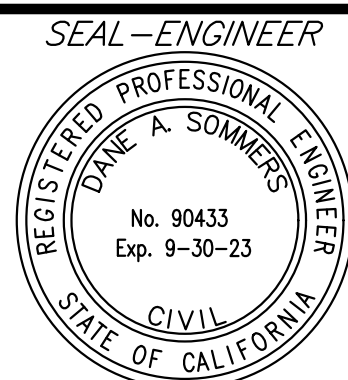
**PRELIMINARY  
NOT FOR CONSTRUCTION**



**NOTE:**  
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

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MARK	BY	DATE	REVISIONS	APPR.	DATE



ENGINEERING COMPANY  
**SDH ASSOCIATES INCORPORATED**  
SDH AND ASSOCIATES INC.  
27363 VIA INDUSTRIA  
TAMECULA, CA 92590  
TEL: (951) 883-3691 FAX: (951) 788-2314

PREPARED BY: DANE A. SOMMERS R.C.E. NO. 90433  
DATE 9-30-23

BENCHMARK:  
NCS DESIGNATION #435 (PID 005442) ELEV=1515.12' (NVD 788)  
DESCRIBED BY METRO WATER DISTRICT SD, CALIFORNIA 1992 PERMS.  
1300 FEET (396.2 M) WEST OF AT&T RAILROAD ALONG RIDER ST. ON  
TOP OF NORTH CURB FACE OF RIDER ST. 38 FEET (9.5 M) NORTH  
OF RIDER ST., 6 FEET (1.8 M) SOUTH OF A ONE TELEPHONE BOX  
(DAMAGED). A STANDARD 3/4" ALUMINUM DIST SET FLUSH IN TOP  
OF CURB.

SCALE:  
H: N/A V: N/A

PPT220024  
B.I.G. PATTERSON INDUSTRIAL  
PRELIMINARY GRADING PLAN  
SECTIONS

FOR:   W.O.   COUNTY FILE NO.  

SHEET NO.  
**3**  
3 OF 3 SHTS



# Appendix 3: Soils Information

*Geotechnical Study and Other Infiltration Testing Data*

# **22G111-1A PRELIMINARY EXECUTIVE SUMMARY**

At the request of the client, we have provided this summary of the geotechnical design recommendations for the proposed development. It should be understood that this summary is based on a cursory review of preliminary boring logs and the laboratory test data completed as of this date. Additional engineering analysis will be performed subsequent to the issuance of this preliminary summary. Therefore, the design recommendations presented in the forthcoming geotechnical report may vary somewhat from the recommendations presented below.

## **Preliminary Geotechnical Design Considerations**

- Artificial fill soils were encountered at the boring locations, with the exception of Boring No. B-3, extending from the ground surface to depths of 3 to 4½± feet. Additional soils classified as possible fill were encountered beneath the artificial fill soils at Boring Nos. B-1 and B-2, extending to depths of 8½ and 5½± feet, respectively.
- The fill soils and near-surface alluvial soils possess varying strengths. The existing fill soils are considered to represent undocumented fill. These soils, in their present condition, are not considered suitable for support of the foundation loads of the new structure. Additionally, the results of laboratory testing indicate that the near-surface soils within the upper 5 to 6± feet possess a moderate potential for collapse when exposed to moisture infiltration as well as consolidation when exposed to load increases in the range of those that will be exerted by the new foundations.
- Remedial grading will be necessary to remove all of the undocumented fill soils in their entirety, the upper portion of the near-surface native alluvial soils, and any soils disturbed during the demolition process, and replace these materials as compacted structural fill soils.

## **Preliminary Site Preparation Recommendations**

- Demolition should include pavements, underground utilities and any other subsurface improvements that will not remain in place with the new development. Debris resultant from demolition should be disposed of off-site.
- Initial site preparation should include stripping of any surficial vegetation. The surficial vegetation, trees, and any organic soils should be properly disposed of off-site.
- Remedial grading is recommended to be performed within the proposed building area in order to remove all of the undocumented fill soils in their entirety, the upper portion of the near-surface native alluvial soils, and any soils disturbed during the demolition process. The soils within the proposed building area should be overexcavated to a depth of 6 feet below existing grade and to a depth of at least 4 feet below proposed building pad subgrade elevations, whichever is greater.
- The depth of overexcavation should also be sufficient to remove any existing fill soils. The proposed foundation influence zones should be overexcavated to a depth of at least 3 feet below proposed foundation bearing grade, and to an extent equal to the depth of fill placed below the foundation bearing grade, whichever is greater.
- Following completion of the overexcavation, the exposed soils should be scarified to a depth of at least 12 inches and moisture treated to 0 to 4 percent above optimum moisture content. The subgrade soils should then be recompacted to at least 90 percent of the ASTM D-1557 maximum dry density. The previously excavated soils may then be replaced as compacted structural fill.

- The new pavement and flatwork subgrade soils are recommended to be scarified to a depth of 12± inches, thoroughly moisture conditioned and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density.

### Preliminary Foundation Design Recommendations

- Conventional shallow foundations, supported in newly placed compacted fill.
- 2,500 lbs/ft<sup>2</sup> maximum allowable soil bearing pressure.
- Reinforcement consisting of at least two (2) No. 5 rebars (1 top and 1 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.

### Preliminary Building Floor Slab Design Recommendations

- Conventional Slab-on-Grade: minimum 6 inches thick.
- Modulus of Subgrade Reaction:  $k = 150$  psi/in.
- Reinforcement is not expected to be necessary for geotechnical considerations. The actual thickness and reinforcement of the floor slab should be determined by the structural engineer.

### Preliminary Infiltration Rates

- Two infiltration tests were performed within the proposed infiltration system area at the subject site.
- The soils encountered at the bottom of the test locations consist of very stiff to hard clayey sands. Based on the composition of the on-site soils, a preliminary infiltration rate of 0.3 inches per hour is recommended for the proposed infiltration system if the bottom of the system extends to a depth of 10± feet below the existing site grades.

### Pavements

ASPHALT PAVEMENTS (R = 30)					
Materials	Thickness (inches)				
	Auto Parking and Auto Drive Lanes (TI = 4.0 to 5.0)	Truck Traffic			
		TI = 6.0	TI = 7.0	TI = 8.0	TI = 9.0
Asphalt Concrete	3	3½	4	5	5½
Aggregate Base	6	8	10	11	13
Compacted Subgrade	12	12	12	12	12

PORTLAND CEMENT CONCRETE PAVEMENTS (R = 30)				
Materials	Thickness (inches)			
	Autos and Light Truck Traffic (TI = 5.0 to 6.0)	Truck Traffic		
		(TI =7.0)	(TI =8.0)	(TI =9.0)
PCC	5	5½	6½	8
Compacted Subgrade (95% minimum compaction)	12	12	12	12

### 2019 CBC Seismic Design Parameters

Parameter		Value
Mapped Spectral Acceleration at 0.2 sec Period	$S_S$	1.500
Mapped Spectral Acceleration at 1.0 sec Period	$S_1$	0.558
Site Class	---	D
Site Modified Spectral Acceleration at 0.2 sec Period	$S_{MS}$	1.500
Site Modified Spectral Acceleration at 1.0 sec Period	$S_{M1}$	0.972
Design Spectral Acceleration at 0.2 sec Period	$S_{DS}$	1.000
Design Spectral Acceleration at 1.0 sec Period	$S_{D1}$	0.648

# Appendix 4: Historical Site Conditions

*Phase I Environmental Site Assessment or Other Information on Past Site Use*

**Not included.**

# Appendix 5: LID Infeasibility

*LID Technical Infeasibility Analysis*

**N/A – Runoff from the project is directed to Canon Lake, which ultimately drains to Lake Elsinore. Based on the infiltration investigation from the geotechnical engineer, infiltration is not technically feasible for this project. A combination of a proprietary underground storage facility and a Modular Wetland System (MWS) is proposed to address the treat runoff from the site and address the storm water quality management plan requirements.**

# Appendix 6: BMP Design Details

*BMP Sizing, Design Details and other Supporting Documentation*

**Santa Ana Watershed - BMP Design Volume,  $V_{BMP}$**

(Rev. 10-2011)

Legend:

Required Entries

Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name **SDH & Associates, Inc.**

Date **8/23/2022**

Designed by **NM**

Case No **PPT220024**

Company Project Number/Name **2121 / B.I.G. Patterson Industrial**

**BMP Identification**

BMP NAME / ID **MWS (Volume-based) / BMP 1**

*Must match Name/ID used on BMP Design Calculation Sheet*

**Design Rainfall Depth**

85th Percentile, 24-hour Rainfall Depth,  
from the Isohyetal Map in Handbook Appendix E

$D_{85} =$  **0.59** inches

**Drainage Management Area Tabulation**

*Insert additional rows if needed to accommodate all DMAs draining to the BMP*

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, $I_f$	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, $V_{BMP}$ (cubic feet)	Proposed Volume on Plans (cubic feet)
DMA 1-1	19,212	Ornamental Landscaping	0.1	0.11	2122.1			
DMA 1-2	89,005	Concrete or Asphalt	1	0.89	79392.5			
DMA 1-3	103,968	Roofs	1	0.89	92739.5			
<b>212185</b>		<b>Total</b>			<b>174254.1</b>	<b>0.59</b>	<b>8567.5</b>	<b>33451</b>

Notes:

The proposed MWS unit is designed using the "volume-based" approach, as the project also proposes an underground storage facility to temporarily store and detain the required water quality volume (upstream of the MWS). The detained flow is directed to the MWS unit for treatment. Therefore, "volume based (cf)" was provided in lieu of the typical "flow based (cfs)" and as such "n/a" was labeled for the flow based section. The underground storage facility is sized to make sure adequate capacity (required water quality volume) is provided, upstream of the proposed MWS unit.

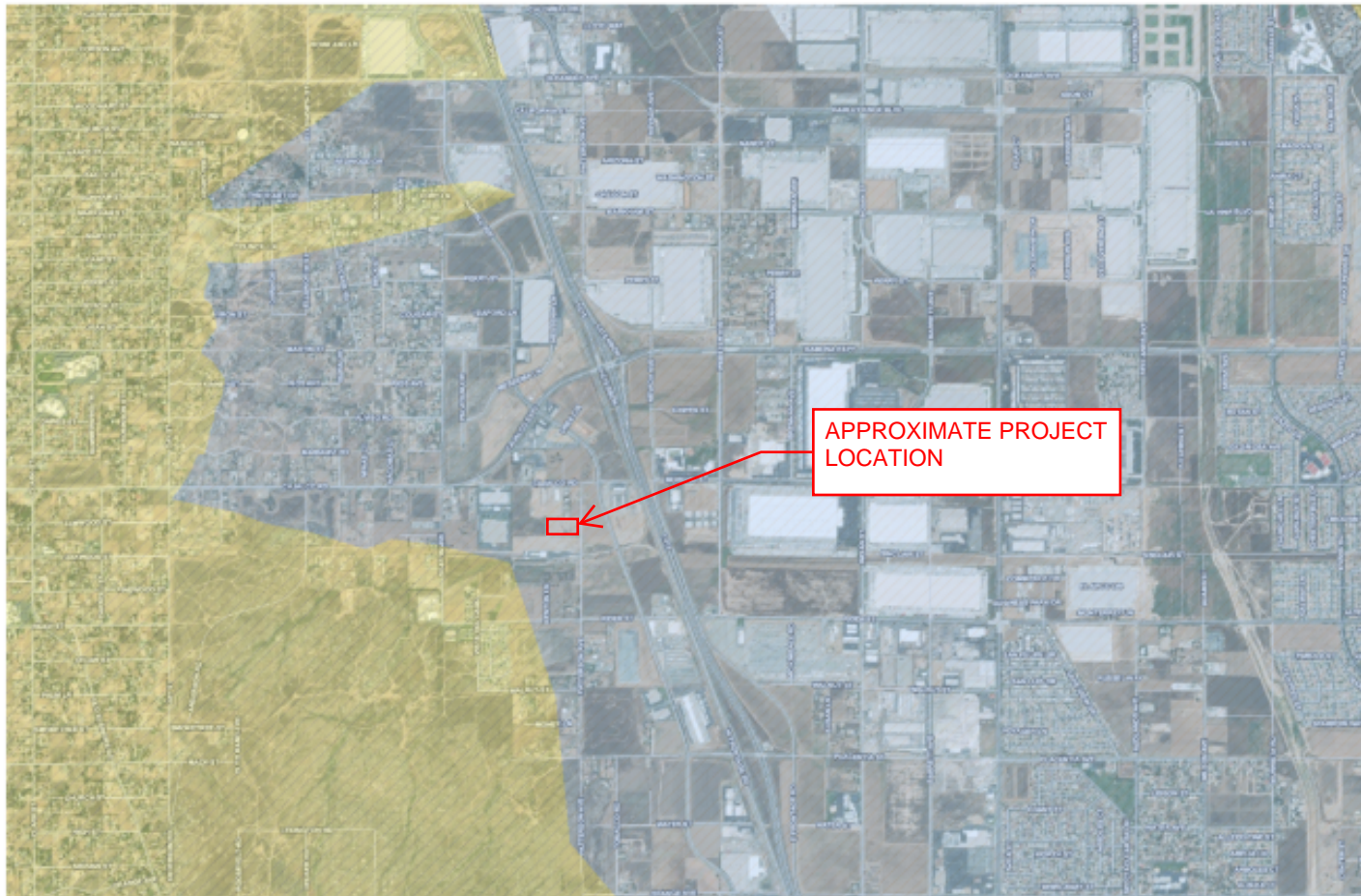


# Appendix 7: Hydromodification

*Supporting Detail Relating to Hydrologic Conditions of Concern*

**Note: The project is within the Riverside County WAP HCOC Exemption area approved on April 20, 2017. Therefore, the project is exempt from the HCOC requirements.**

SCREEN CAPTURE - RIVERSIDE COUNTY STORM  
WATER & WATER CONSERVATION TRACKING TOOL  
HCOC EXEMPTION AREAS



Site Address: rivco.permitrack.com

Stormwater Data

- Hydromodification Susceptibility Mapping
- 2010 - 303d/TMDL
- Hydromodification Exemption Areas

Potentially Not Exempt

Potentially Exempt

NOTE: THE PROJECT IS WITHIN THE RIVERSIDE COUNTY WAP HCOC EXEMPTION AREA APPROVED ON APRIL 20, 2017. THEREFORE, THE PROJECT SHOULD BE EXEMPT FROM THE HCOC REQUIREMENTS.

# Appendix 8: Source Control

*Pollutant Sources/Source Control Checklist*

**Note: The Source Control checklist will be prepared during final engineering (construction document) stage at the time of the final WQMP.**

## Appendix 9: O&M

*Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms*

**Note: The O&M Plan will be prepared during final engineering (construction document) stage at the time of the final WQMP.**

# Appendix 10: Educational Materials

*BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information*

**Note:** Copies of the proposed BMP details are included for reference purpose. The following reference materials are anticipated to be included in this Appendix during final engineering stage at the time of the final WQMP.

- **SC-10 – Non-Stormwater Discharges**
- **SC-11 – Spill Prevention, Control & Cleanup**
- **SC-30 – Outdoor Loading/Unloading**
- **SC-34 – Waste Handling and Disposal**
- **SC-41 – Building & Grounds Maintenance**
- **SC-43 – Parking/Storage Area Maintenance**
- **SC-60 – Housekeeping Practices**
- **SD-10 – Site Design and Landscape Planning**
- **SD-11 – Roof Runoff Controls**
- **SD-12 – Efficient Irrigation**
- **SD-13 – Storm Drain Signage**
- **SD-32 – Trash Storage Areas**



**STRUCTURAL DESIGN LOADING CRITERIA**

LIVE LOADING: **AASHTO HS-20 HIGHWAY LOADING**  
 GROUND WATER TABLE: BELOW INVERT OF SYSTEM  
 SOIL BEARING PRESSURE: 3000PSF  
 SOIL DENSITY: 120 PCF  
 EQUIVALENT UNSATURATED  
 LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.  
 EQUIVALENT SATURATED  
 LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)  
 APPLICABLE CODES: ASTM C857  
 ACI-318  
 BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

**STORMTRAP SYSTEM INFORMATION**

WATER STORAGE PROV: 33,450.83 CUBIC FEET  
 UNIT HEADROOM: 7'-2" SINGLETRAP

**SITE SPECIFIC DESIGN CRITERIA**

1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 0.78' MAX. 2.78' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.
5. SYSTEM DESIGN MAY ALLOW FOR INCIDENTAL LEAKAGE AND WILL NOT BE SUBJECT TO LEAKAGE TESTING.

**StormTrap**

PATENTS LISTED AT: [HTTP://STORMTRAP.COM/PATENT]

1287 WINDHAM PARKWAY  
 ROMEVILLE, IL 60446  
 P:815-941-4549 / F:331-318-5347

**ENGINEER INFORMATION:**

**SDH & ASSOCIATES**  
 27363 VIA INDUSTRIA  
 TEMECULA, CA 92590  
 951.683.3691

**PROJECT INFORMATION:**

B.I.G. - PATTERSON  
 RIVERSIDE COUNTY, CA

**CURRENT ISSUE DATE:**

3/29/2022

**ISSUED FOR:**

PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	3/29/22	PRELIMINARY	KW

**SCALE:**

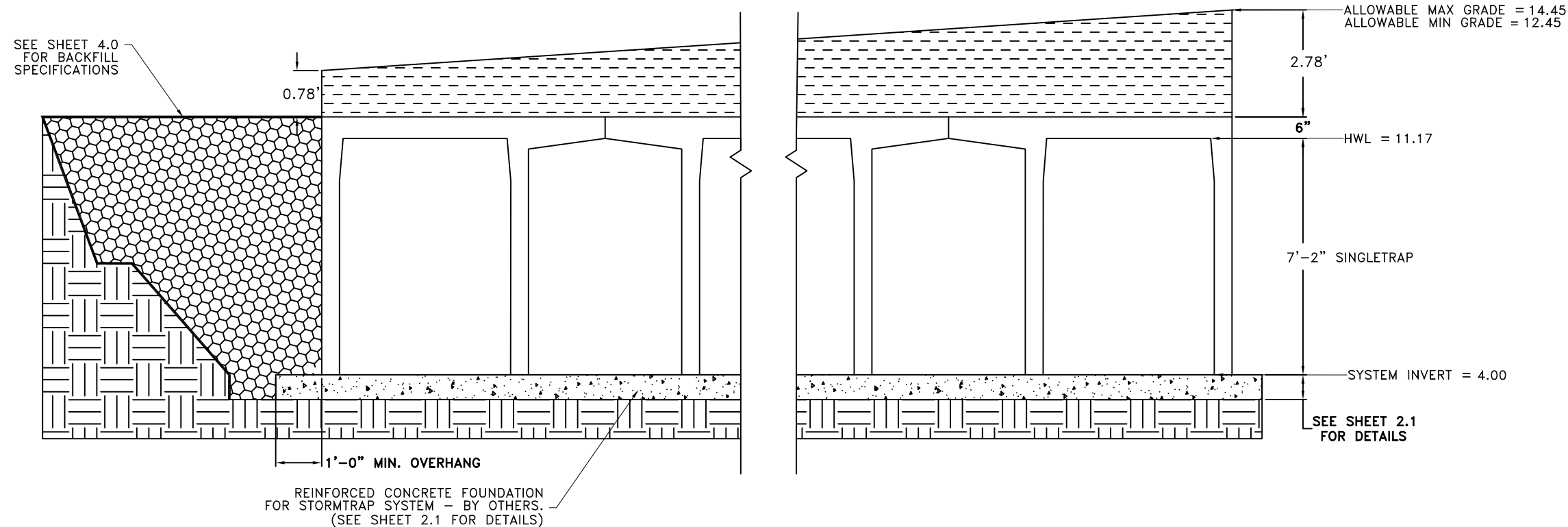
NTS

**SHEET TITLE:**

SINGLETRAP  
 DESIGN  
 CRITERIA

**SHEET NUMBER:**

1.0



7'-2" SINGLETRAP

**BILL OF MATERIALS**

QTY.	UNIT TYPE	DESCRIPTION	WEIGHT
20	I	7'-2" SINGLETRAP	18793
0	II	7'-2" SINGLETRAP	0
21	III	7'-2" SINGLETRAP	20449
2	IV	7'-2" SINGLETRAP	22538
0	VII	7'-2" SINGLETRAP	0
3	SPIV	7'-2" SINGLETRAP	VARIABLES
1	T2 PANEL	6" THICK PANEL	4842
4	T4 PANEL	6" THICK PANEL	3810
0	T7 PANEL	6" THICK PANEL	0
10	JOINTWRAP	150' PER ROLL	
40	JOINTTAPE	14.5' PER ROLL	
TOTAL PIECES = 46			
TOTAL PANELS = 5			
HEAVIEST PICK WEIGHT = 22538			

**LOADING DISCLAIMER:**

STORMTRAP IS NOT DESIGNED TO ACCEPT ANY ADDITIONAL LOADINGS FROM NEARBY STRUCTURES NEXT TO OR OVER THE TOP OF STORMTRAP. IF ADDITIONAL LOADING CONSIDERATIONS ARE REQUIRED FOR STRUCTURAL DESIGN OF STORMTRAP, PLEASE CONTACT STORMTRAP IMMEDIATELY.

**TREE LOADING DISCLAIMER:**

THE STORMTRAP SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT THE ADDITIONAL WEIGHT OF ANY TREES. FURTHERMORE, THE ROOTS OF THE TREES MUST BE CONTAINED TO PREVENT FUTURE DAMAGE TO THE STORMTRAP SYSTEM. STORMTRAP ACCEPTS NO LIABILITY FOR DAMAGES CAUSED BY TREES OR OTHER VEGETATION PLACED AROUND OR ON TOP OF THE SYSTEM.

**SEDIMENT/SAND FILTER DISCLAIMER:**

FOR SYSTEMS CONTAINING SEDIMENT AND SAND FILTER MODULES; IF REQUIRED TO BE SEALED TO PREVENT SAND AND/OR PRE-TREATED WATER FROM MIGRATING INTO ADJOINING MODULES, IT IS THE SOLE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO ENSURE THAT THOSE MODULES ARE SEALED.

**DESIGN CRITERIA**

ALLOWABLE MAX GRADE = 14.45  
 ALLOWABLE MIN GRADE = 12.45  
 INSIDE HEIGHT ELEVATION = 11.17  
 SYSTEM INVERT = 4.00

**NOTES:**

- DIMENSIONING OF STORMTRAP SYSTEM SHOWN BELOW ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
- ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
- SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.
- SP - INDICATES A MODULE WITH MODIFICATIONS.
- P - INDICATES A MODULE WITH A PANEL ATTACHMENT.
- CONTRACTORS RESPONSIBILITY TO ENSURE CONSISTENCY/ACCURACY TO FINAL ENGINEER OF RECORD PLAN SET.
- IF A WATERTIGHT SOLUTION IS REQUIRED FOR AN OUTLET CONTROL STRUCTURE, ALL EXTERIOR COLD JOINTS, INCLUDING JOINT BETWEEN TOP AND BASE MODULES, BETWEEN TOP AND BASE OF ADJOINING SYMONS WALLS, AND JOINTS BETWEEN MODULE AND ADJACENT END PANELS WILL BE THE SOLE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO PROVIDE AND INSTALL THE WATERTIGHT APPLICATION PER THE EOR'S SPECIFICATION.



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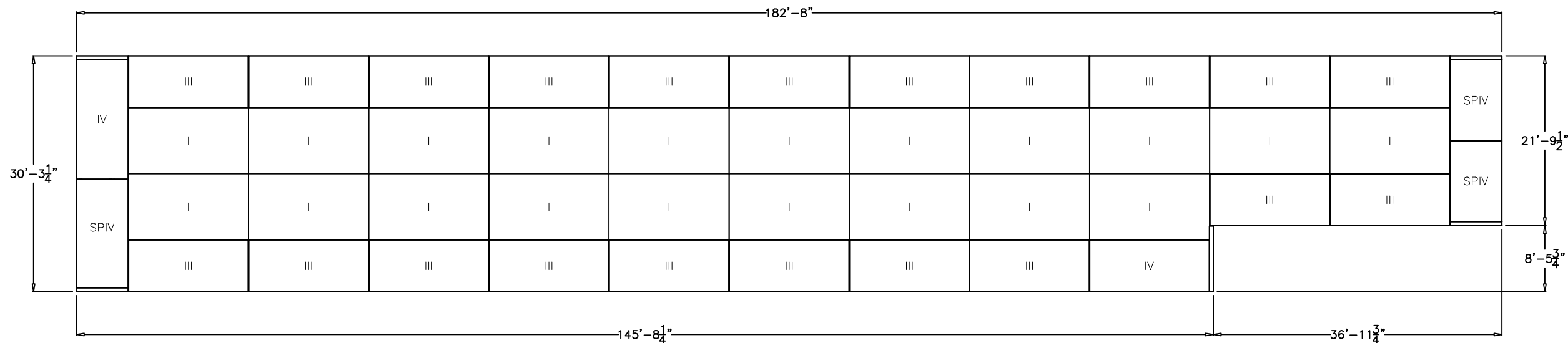
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**SHEET TITLE:**

SINGLETRAP  
 SYSTEM LAYOUT

**SHEET NUMBER:**

2.0





**StormTrap**

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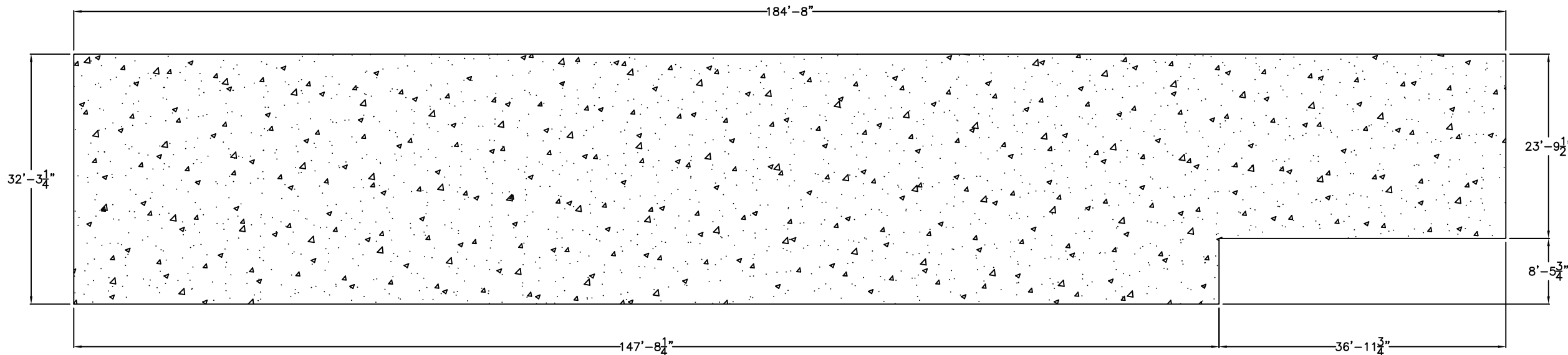
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**SHEET TITLE:**

SINGLETRAP  
FOUNDATION  
LAYOUT

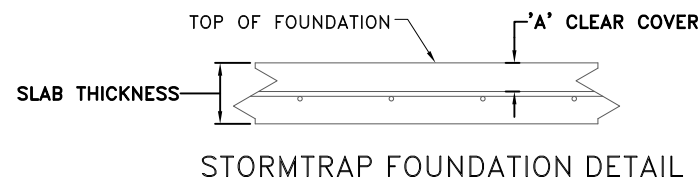
**SHEET NUMBER:**

2.1



**CONCRETE FOUNDATION NOTES:**

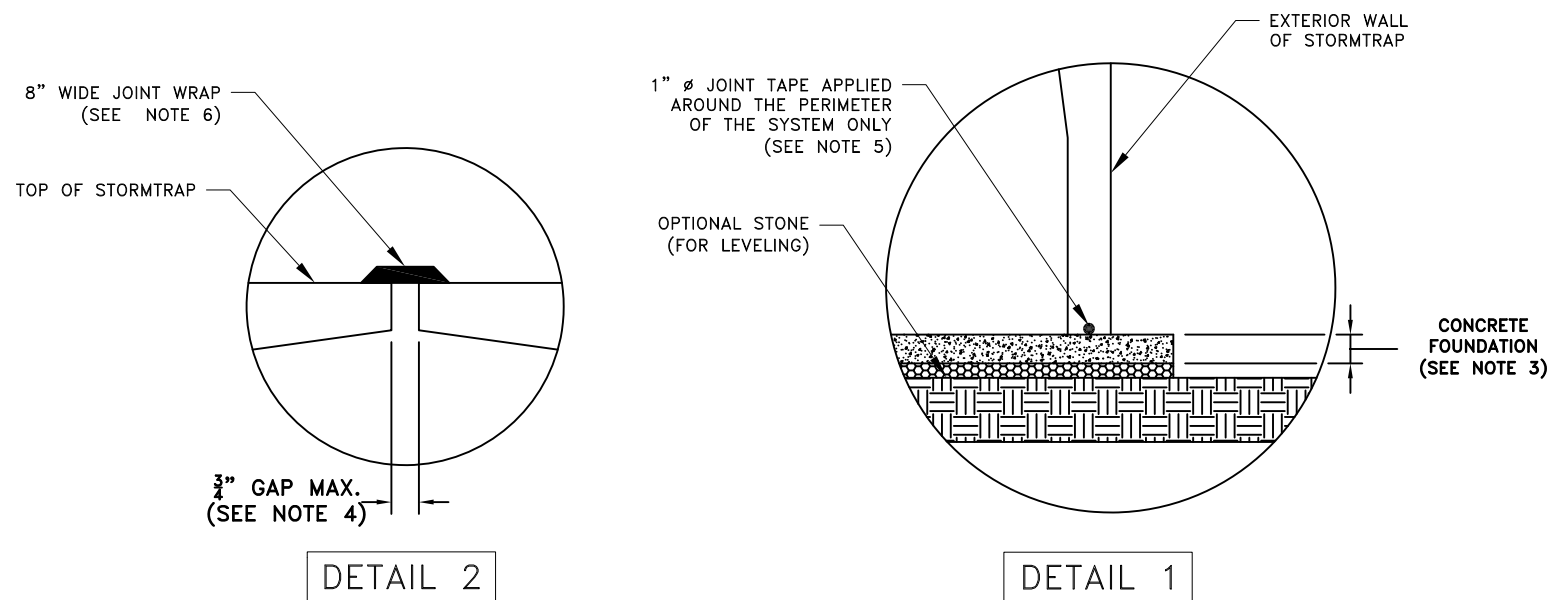
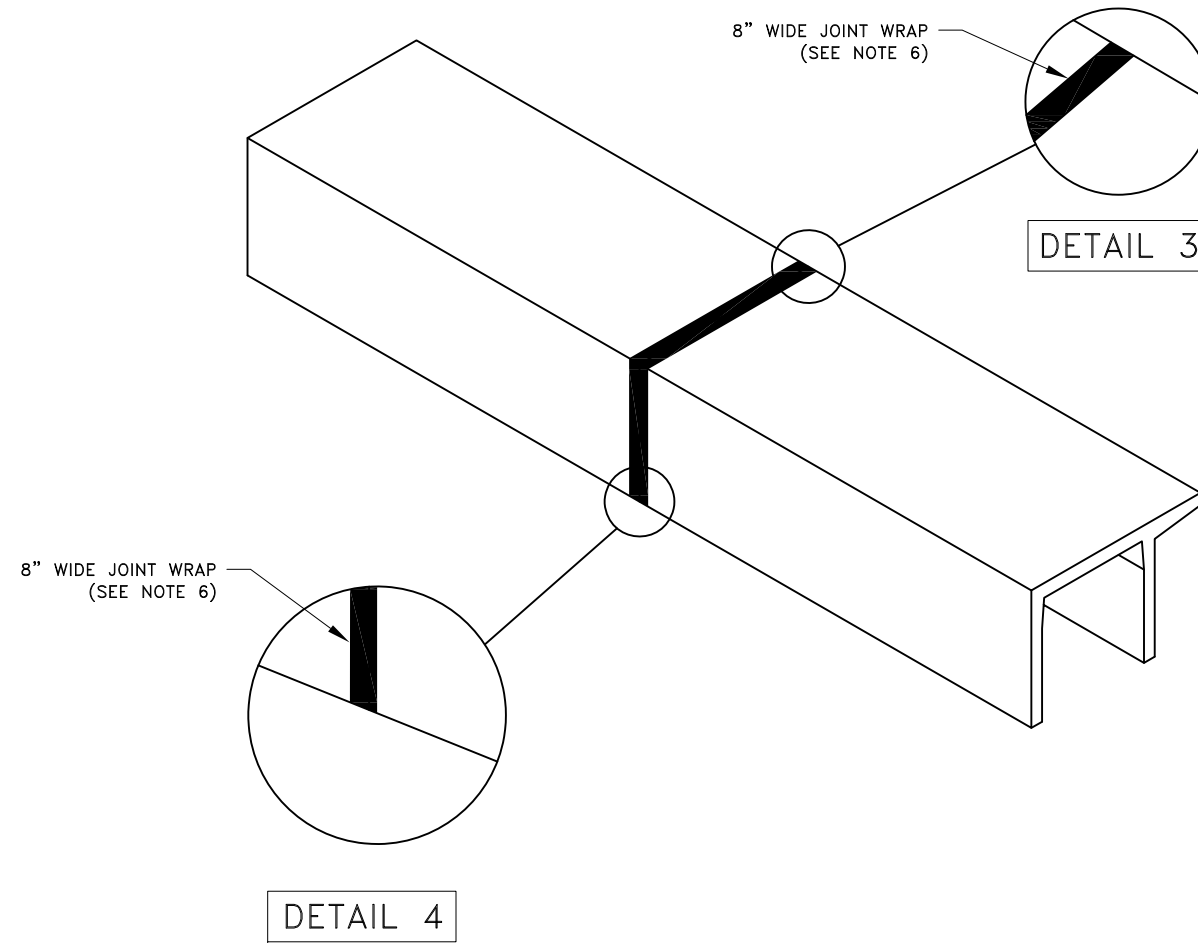
1. CONCRETE FOUNDATION TO BE SUPPLIED AND INSTALLED BY OTHERS.
2. CONCRETE STRENGTH @ 28 DAYS, 5%-8% ENTRAINED AIR, 4" MAX SLUMP.
3. NET ALLOWABLE SOIL PRESSURE AS INDICATED ON SHEET 1.0.
4. SOIL CONDITIONS TO BE VERIFIED ON SITE BY OTHERS.
5. REBAR: ASTM A615 GRADE 60, BLACK BAR.
6. DIMENSION OF FOUNDATION MUST HAVE 1'-0" OVERHANG BEYOND EXTERNAL FACE OF MODULE.
7. DIMENSION OF STORMTRAP SYSTEM ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
8. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
9. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.



HS-20 & HS-25 LOADING - (ACI 318, ST2)				
MAXIMUM SYSTEM COVER	SLAB THICKNESS	CONCRETE STRENGTH	REINFORCEMENT (BOTH DIRECTIONS)	'A' CLEAR COVER
1'-0"	8"	4000 PSI	#4 @ 18" O.C.	3.5"
1'-1" - 2'-0"	8"	4000 PSI	#4 @ 16" O.C.	3.5"
2'-1" - 3'-0"	8"	4000 PSI	#4 @ 12" O.C.	3.5"
3'-1" - 4'-0"	8"	4000 PSI	#4 @ 12" O.C.	3.5"
4'-1" - 5'-0"	8"	4000 PSI	#5 @ 18" O.C.	3.375"
5'-1" - 6'-0"	8"	4000 PSI	#5 @ 16" O.C.	3.375"
6'-1" - 7'-0"	8"	4000 PSI	#5 @ 12" O.C.	3.375"
7'-1" - 8'-0"	9"	4000 PSI	#5 @ 12" O.C.	3.875"
8'-1" - 9'-0"	9"	4000 PSI	#5 @ 12" O.C.	3.875"
9'-1" - 10'-0"	9"	4000 PSI	#5 @ 12" O.C.	3.875"

## STORMTRAP INSTALLATION SPECIFICATIONS

1. STORMTRAP SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C891, STANDARD FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES, THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
2. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO ENSURE THAT PROPER/ADEQUATE EQUIPMENT IS USED TO SET/INSTALL THE MODULES.
3. STORMTRAP MODULES SHALL BE PLACED ON A LEVEL CONCRETE FOUNDATION (SEE SHEET 2.1) WITH A 1'-0" OVERHANG ON ALL SIDES THAT SHALL BE POURED IN PLACE BY INSTALLING CONTRACTOR. A QUALIFIED GEOTECHNICAL ENGINEER WILL BE EMPLOYED, BY OWNER, TO PROVIDE ASSISTANCE IN EVALUATING THE EXISTING SOIL CONDITIONS TO ENSURE THAT THE SOIL BEARING PRESSURE MEETS OR EXCEEDS THE STRUCTURAL DESIGN LOADING CRITERIA AS SPECIFIED ON SHEET 1.0.
4. THE STORMTRAP MODULES SHALL BE PLACED SUCH THAT THE MAXIMUM SPACE BETWEEN ADJACENT MODULES DOES NOT EXCEED  $\frac{3}{4}$ " (SEE DETAIL 2). IF THE SPACE EXCEEDS  $\frac{3}{4}$ ", THE MODULES SHALL BE RESET WITH APPROPRIATE ADJUSTMENT MADE TO LINE AND GRADE TO BRING THE SPACE INTO SPECIFICATION.
5. THE PERIMETER HORIZONTAL JOINT BETWEEN THE STORMTRAP MODULES AND THE CONCRETE FOUNDATION SHALL BE SEALED TO THE FOUNDATION WITH PRE-FORMED MASTIC JOINT SEALER ACCORDING TO ASTM C891, 8.8 AND 8.12 (SEE DETAIL 1). THE MASTIC JOINT TAPE DOES NOT PROVIDE A WATERTIGHT SEAL.
6. ALL EXTERIOR ROOF AND EXTERIOR VERTICAL WALL JOINTS BETWEEN ADJACENT STORMTRAP MODULES SHALL BE SEALED WITH 8" WIDE PRE-FORMED, COLD-APPLIED, SELF-ADHERING ELASTOMERIC RESIN, BONDED TO A WOVEN, HIGHLY PUNCTURE RESISTANT POLYMER WRAP, CONFORMING TO ASTM C891 AND SHALL BE INTEGRATED WITH PRIMER SEALANT AS APPROVED BY STORMTRAP (SEE DETAILS 2, 3, & 4). THE JOINT WRAP DOES NOT PROVIDE A WATERTIGHT SEAL. THE SOLE PURPOSE OF THE JOINT WRAP IS TO PROVIDE A SILT AND SOIL TIGHT SYSTEM. THE ADHESIVE EXTERIOR JOINT WRAP SHALL BE INSTALLED ACCORDING TO THE FOLLOWING INSTALLATION INSTRUCTIONS:
  - 6.1. USE A BRUSH OR WET CLOTH TO THOROUGHLY CLEAN THE OUTSIDE SURFACE AT THE POINT WHERE JOINT WRAP IS TO BE APPLIED.
  - 6.2. A RELEASE PAPER PROTECTS THE ADHESIVE SIDE OF THE JOINT WRAP. PLACE THE ADHESIVE TAPE (ADHESIVE SIDE DOWN) AROUND THE STRUCTURE, REMOVING THE RELEASE PAPER AS YOU GO. PRESS THE JOINT WRAP FIRMLY AGAINST THE STORMTRAP MODULE SURFACE WHEN APPLYING.
7. IF THE CONTRACTOR NEEDS TO CANCEL ANY SHIPMENTS, THEY MUST DO SO 48 HOURS PRIOR TO THEIR SCHEDULED ARRIVAL AT THE JOB SITE. IF CANCELED AFTER THAT TIME, PLEASE CONTACT THE PROJECT MANAGER.
8. IF THE STORMTRAP MODULE(S) IS DAMAGED IN ANY WAY PRIOR, DURING, OR AFTER INSTALL, STORMTRAP MUST BE CONTACTED IMMEDIATELY TO ASSESS THE DAMAGE AND DETERMINE WHETHER OR NOT THE MODULE(S) WILL NEED TO BE REPLACED. IF ANY MODULE ARRIVES AT THE JOBSITE DAMAGED DO NOT UNLOAD IT; CONTACT STORMTRAP IMMEDIATELY. ANY DAMAGE NOT REPORTED BEFORE THE TRUCK IS UNLOADED WILL BE THE CONTRACTOR'S RESPONSIBILITY.
9. STORMTRAP MODULES CANNOT BE ALTERED IN ANY WAY AFTER MANUFACTURING WITHOUT WRITTEN CONSENT FROM STORMTRAP.



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### SHEET TITLE:

SINGLETRAP  
INSTALLATION  
SPECIFICATIONS

### SHEET NUMBER:

3.0



ZONE CHART		
ZONES	ZONE DESCRIPTIONS	REMARKS
ZONE 2	BACKFILL	UNIFIED SOILS CLASSIFICATION (GW, GP, SW, SP) OR SEE BELOW FOR APPROVED BACKFILL OPTIONS
ZONE 3	FINAL COVER OVERTOP	MATERIALS NOT TO EXCEED

120 PCF

FILL DEPTH	TRACK WIDTH	MAX VEHICLE WEIGHT (KIPS)	MAX GROUND PRESSURE
12"	12"	51.8	1690 psf
	18"	56.1	1219 psf
	24"	68.1	1111 psf
	30"	76.7	1000 psf
	36"	85.0	924 psf

NOTE:  
TRACK LENGTH NOT TO EXCEED 15'-4".  
ONLY TWO TRACKS PER VEHICLE.

### STORMTRAP ZONE INSTALLATION SPECIFICATIONS/PROCEDURES

1. THE FILL PLACED AROUND THE STORMTRAP MODULES MUST DEPOSITED ON BOTH SIDES AT THE SAME TIME AND TO APPROXIMATELY THE SAME ELEVATION. AT NO TIME SHALL THE FILL BEHIND ONE SIDE WALL BE MORE THAN 2'-0" HIGHER THAN THE FILL ON THE OPPOSITE SIDE. BACKFILL SHALL EITHER BE COMPACTED AND/OR VIBRATED TO ENSURE THAT BACKFILL AGGREGATE/STONE MATERIAL IS WELL SEATED AND PROPERLY INTER LOCKED. CARE SHALL BE TAKEN TO PREVENT ANY WEDGING ACTION AGAINST THE STRUCTURE, AND ALL SLOPES WITHIN THE AREA TO BE BACKFILLED MUST BE STEPPED OR SERRATED TO PREVENT WEDGING ACTION. CARE SHALL ALSO BE TAKEN AS NOT TO DISRUPT THE JOINT WRAP FROM THE JOINT DURING THE BACKFILL PROCESS. BACKFILL MUST BE FREE-DRAINING MATERIAL. SEE ZONE 2 BACKFILL CHART ON THIS PAGE FOR APPROVED BACKFILL OPTIONS. IF NATIVE EARTH IS SUSCEPTIBLE TO MIGRATION, CONFIRM WITH GEOTECHNICAL ENGINEER AND PROVIDE PROTECTION AS REQUIRED (PROVIDED BY OTHERS).
2. DURING PLACEMENT OF MATERIAL OVERTOP THE SYSTEM, AT NO TIME SHALL MACHINERY BE USED OVERTOP THAT EXCEEDS THE DESIGN LIMITATIONS OF THE SYSTEM. WHEN PLACEMENT OF MATERIAL OVERTOP, MATERIAL SHALL BE PLACED SUCH THAT THE DIRECTION OF PLACEMENT IS PARALLEL WITH THE OVERALL LONGITUDINAL DIRECTION OF THE SYSTEM WHENEVER POSSIBLE.
3. THE FILL PLACED OVERTOP THE SYSTEM SHALL BE PLACED AT A MINIMUM OF 6" LIFTS. AT NO TIME SHALL MACHINERY OR VEHICLES GREATER THAN THE DESIGN HS-20 LOADING CRITERIA TRAVEL OVERTOP THE SYSTEM WITHOUT THE MINIMUM DESIGN COVERAGE. IF TRAVEL IS NECESSARY OVERTOP THE SYSTEM PRIOR TO ACHIEVING THE MINIMUM DESIGN COVER, IT MAY BE NECESSARY TO REDUCE THE ULTIMATE LOAD/BURDEN OF THE OPERATING MACHINERY SO AS TO NOT EXCEED THE DESIGN CAPACITY OF THE SYSTEM. IN SOME CASES, IN ORDER TO ACHIEVE REQUIRED COMPACTION, HAND COMPACTION MAY BE NECESSARY IN ORDER NOT TO EXCEED THE ALLOTTED DESIGN LOADING. SEE CHART FOR TRACKED VEHICLE WIDTH AND ALLOWABLE MAXIMUM PRESSURE PER TRACK.
4. STONE AGGREGATE FOUNDATION IN ZONE 1 IS RECOMMENDED FOR LEVELING PURPOSES ONLY (OPTIONAL).

APPROVED ZONE 2 BACKFILL OPTIONS	
OPTION	REMARKS
3/4" STONE AGGREGATE	THE STONE AGGREGATE SHALL CONSIST OF CLEAN AND FREE DRAINING ANGULAR MATERIAL. THE SIZE OF THIS MATERIAL SHALL HAVE 100% PASSING THE 1" SIEVE WITH 0% TO 5% PASSING THE #8 SIEVE. THIS MATERIAL SHALL BE SEPARATED FROM NATIVE MATERIAL USING GEOFABRIC AROUND THE PERIMETER OF THE BACKFILL (ASTM SIZE #57) AS DETERMINED BY THE GEOTECHNICAL ENGINEER.
SAND	IMPORTED PURE SAND IS PERMITTED TO BE USED AS BACKFILL IF IT IS CLEAN AND FREE DRAINING. THE SAND USED FOR BACKFILLING SHALL HAVE LESS THAN 40% PASSING #40 SIEVE AND LESS THAN 5% PASSING #200 SIEVE. THIS MATERIAL SHALL BE SEPARATED FROM NATIVE MATERIAL USING GEOFABRIC AROUND THE PERIMETER OF THE SAND BACKFILL.
CRUSHED CONCRETE AGGREGATE	CLEAN, FREE DRAINING CRUSHED CONCRETE AGGREGATE MATERIAL CAN BE USED AS BACKFILL FOR STORMTRAP'S MODULES. THE SIZE OF THIS MATERIAL SHALL HAVE 100% PASSING THE 1" SIEVE WITH 0% TO 5% PASSING THE #8 SIEVE. THIS MATERIAL SHALL BE SEPARATED FROM NATIVE MATERIAL USING GEOFABRIC AROUND THE PERIMETER OF THE BACKFILL.
ROAD PACK	STONE AGGREGATE 100% PASSING THE 1-1/2" SIEVE WITH LESS THAN 12% PASSING THE #200 SIEVE (ASTM SIZE #467). GEOFABRIC AS PER GEOTECHNICAL ENGINEER RECOMMENDATION.

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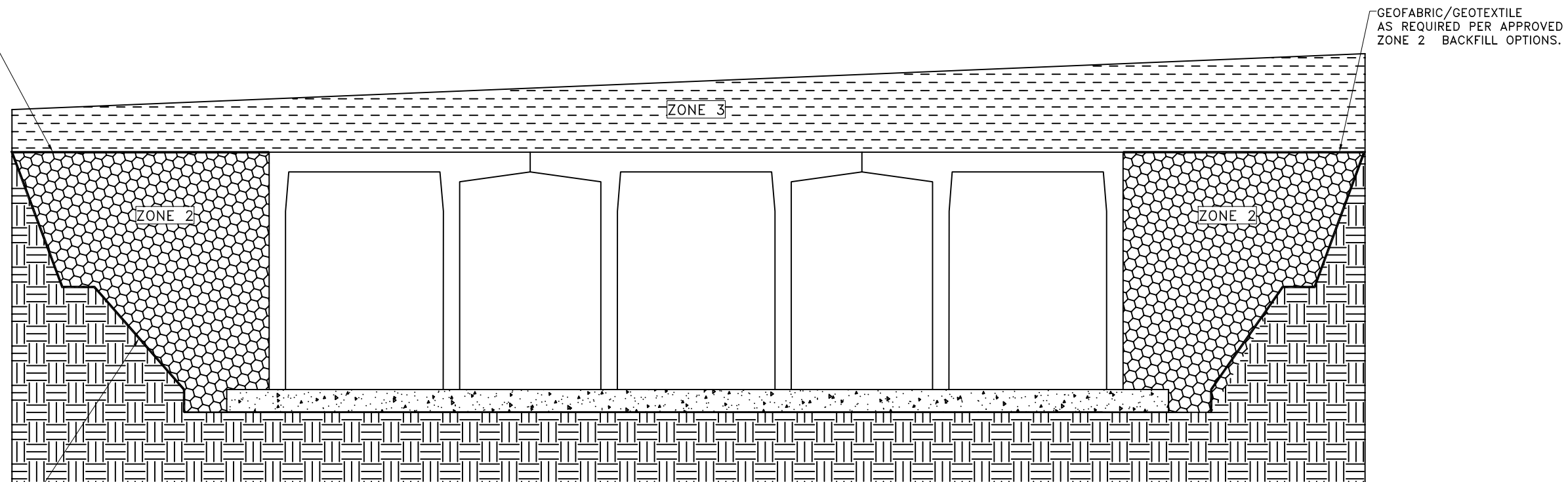
### SHEET TITLE:

SINGLETRAP  
BACKFILL  
SPECIFICATIONS

### SHEET NUMBER:

4.0

GEOFABRIC/GEOTEXTILE AS REQUIRED PER APPROVED ZONE 2 BACKFILL OPTIONS.



BACKFILL DETAIL

STEPPED OR SERRATED AND APPLICABLE OSHA REQUIREMENTS (SEE INSTALLATION SPECIFICATIONS)



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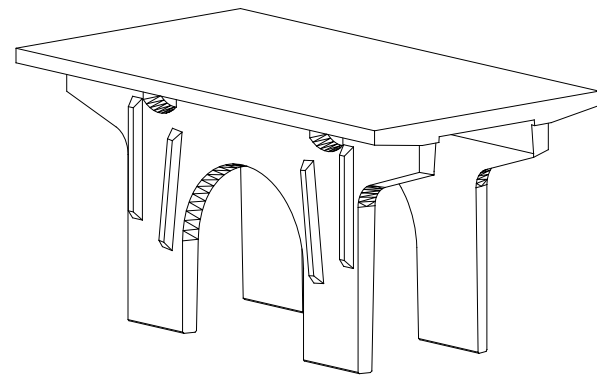
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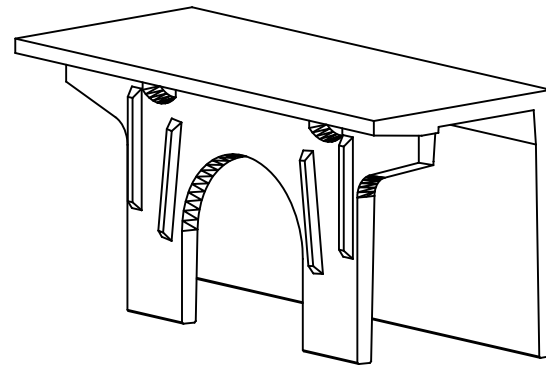
SINGLETRAP  
MODULE TYPES

## SHEET NUMBER:

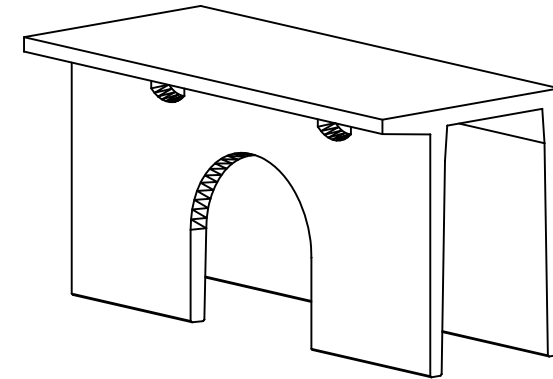
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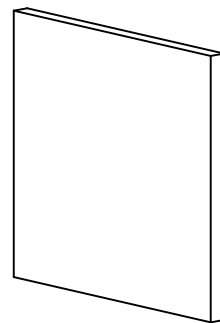
TYPE I



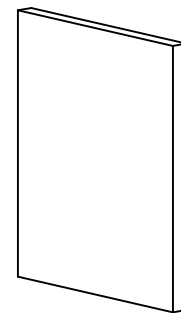
TYPE III



TYPE IV



TYPE II  
END PANEL



TYPE IV  
END PANEL

## NOTES:

1. OPENING LOCATIONS AND SHAPES MAY VARY.
2. SP - INDICATES A MODULE WITH MODIFICATIONS.
3. P - INDICATES A MODULE WITH A PANEL ATTACHMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

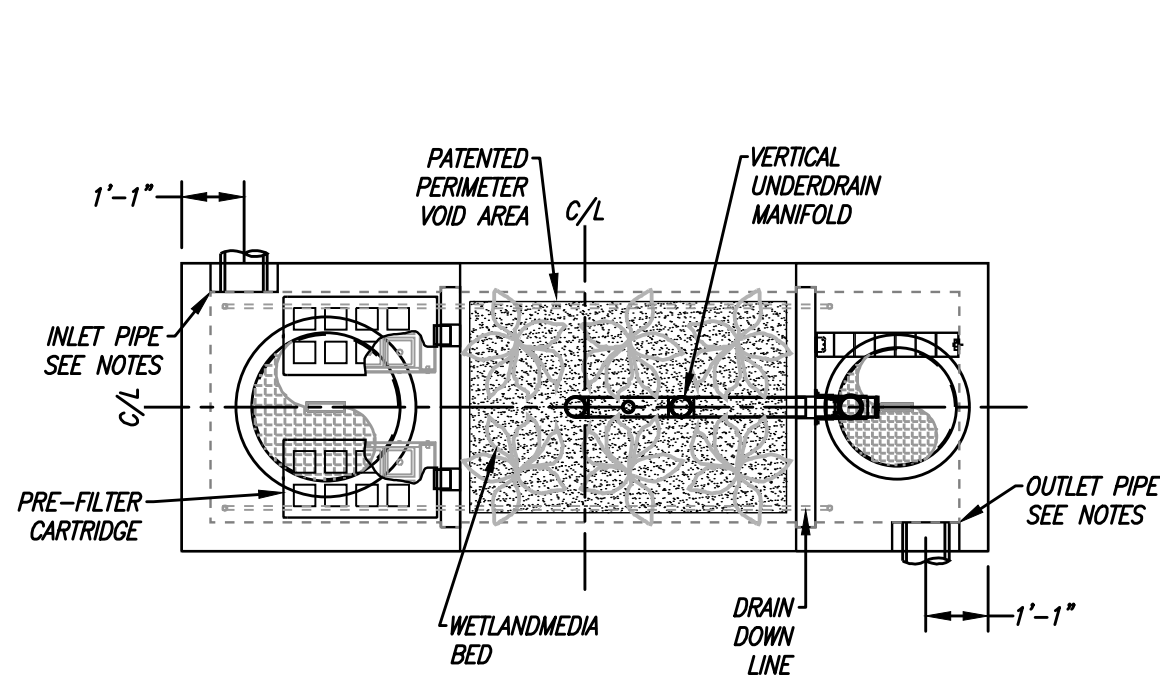
SITE SPECIFIC DATA			
PROJECT NUMBER	15181		
PROJECT NAME	BRIDGE I.G. PATTERSON		
PROJECT LOCATION	RIVERSIDE, CA		
STRUCTURE ID	BMP 1		
TREATMENT REQUIRED			
FLOW BASED (CFS)	VOLUME BASED (CF)		
N/A	8613		
TREATMENT HGL AVAILABLE (FT)	N/K		
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	OFFLINE		
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	3.90	HDPE	8"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	3.55	HDPE	8"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	13.20	13.20	13.20
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	ø30"	OPEN PLANTER	ø24"
WETLANDMEDIA VOLUME (CY)	7.22		
ORIFICE SIZE (DIA. INCHES)	ø1.71"		
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			

### INSTALLATION NOTES

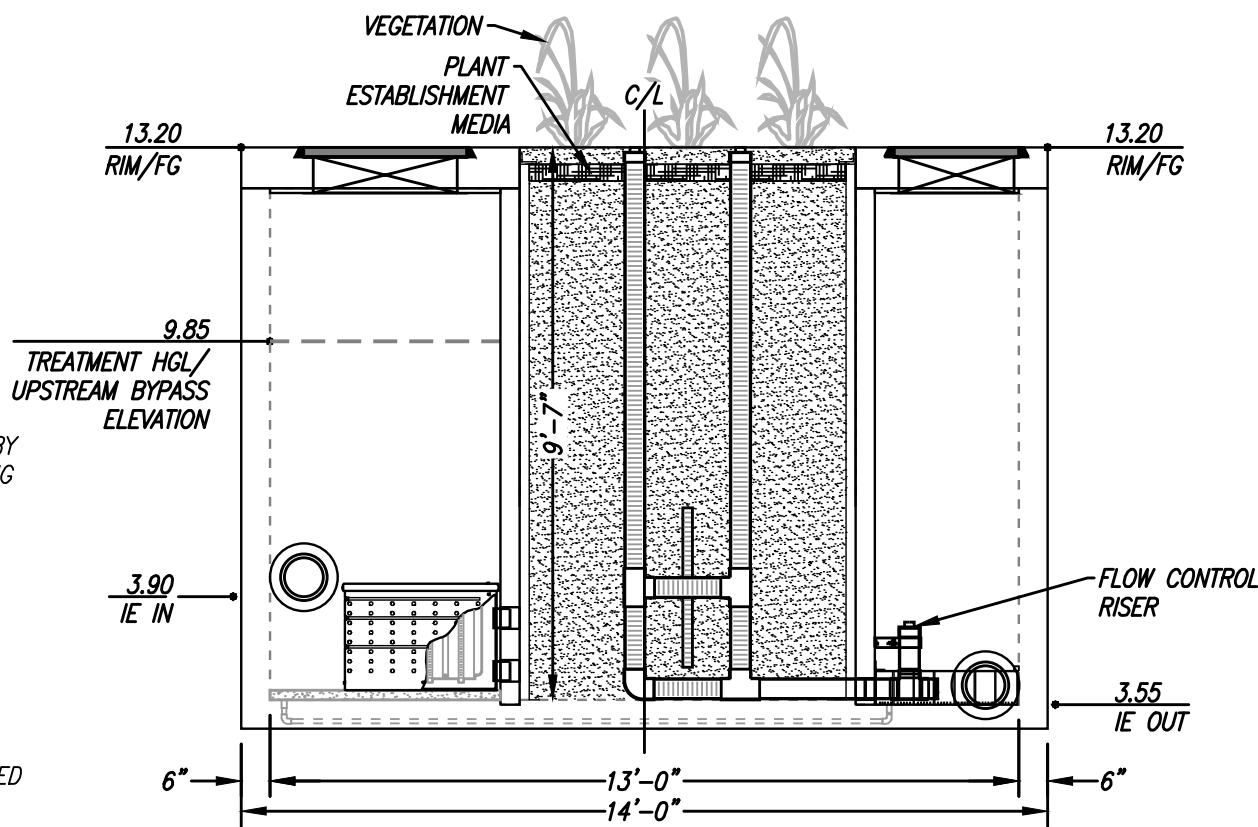
- CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
- UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER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

### GENERAL NOTES

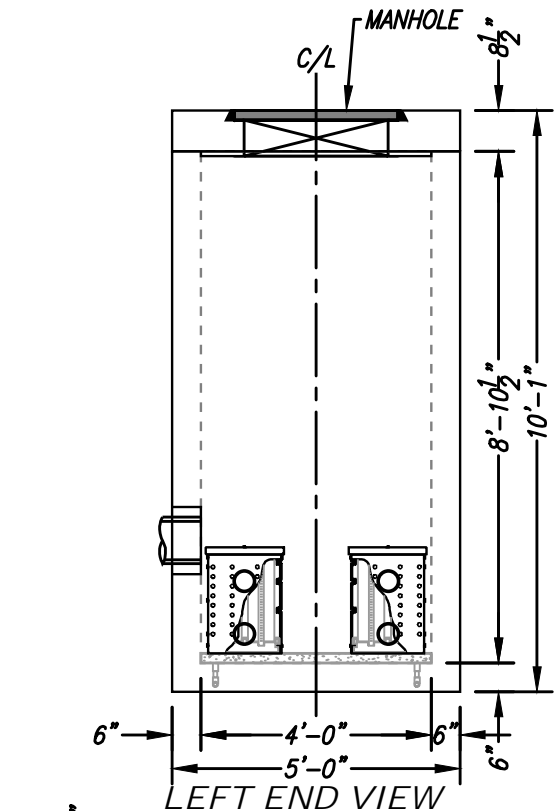
- MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
- ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



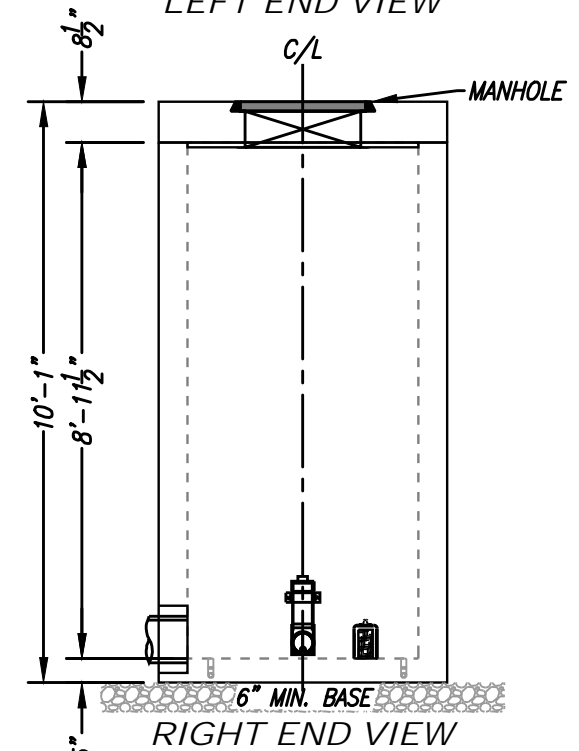
PLAN VIEW



ELEVATION VIEW

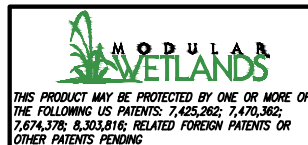


LEFT END VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	8613
DRAINDOWN DURATION (HOURS)	36
AVERAGE DISCHARGE RATE PER MWS UNIT (GPM)	30.14
OPERATING HEAD (FT)	6.3
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26



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**MWS-L-4-13-9'-7"-V**  
**STORMWATER BIOFILTRATION SYSTEM**  
**STANDARD DETAIL**

**PACKAGED PUMP LIFT STATION  
B.I.G PATTERSON INDUSTRIAL**

Furnish and install complete pre-packaged duplex Lift Station model #PSI-SDH081822 as manufactured by Pacific Southwest Industries (national phone # 800-358-9095)

This pre-packaged Lift Station shall incorporate a quick removal system manufactured by the pump manufacturer. The pump(s) shall be guided to the discharge base elbow by a single or double guide rail and shall be stainless steel and shall extend from the discharge base elbow to the upper guide bracket mounted on 1-5/8" x 1-5/8" channel strut just below the basin cover. Stainless steel lifting chain or cable shall be supplied and properly installed to remove the pump from the wet well. The internal discharge piping shall be completely pre-plumbed with pressure rated schedule 40 or 80 PVC pipe as indicated and extend 12" beyond the wet well and valve vault side wall for contractor connection to the force main piping. The pump(s) discharge piping shall have a check and ball valve installed on each pump discharge. The Lift Station shall include control panel and level control floats. The control panel shall be suitable for surface mounting or free standing on a leg kit if the site conditions require it.

**PUMP DESIGN:**

Pump(s) shall be AF SERIES capable of handling raw unscreened sewage, consisting of water, fibrous materials without clogging. All exposed hardware shall be stainless steel. The volute, impeller, seal plates and motor housing shall be constructed of high quality ASTM 48 Class 30 cast iron. The pump (s) shall be capable of handling liquids with temperatures to 120 degrees F. The Pump(s) motor shaft shall be 420 stainless steel supported by a lower Single roll ball bearing and an upper single roll ball bearing. All mating parts shall be machined and sealed with Buna-N O-rings.

**POWER CABLE:**

The pump shall be equipped with 30' of power cord. The ground wire shall be longer than the motor leads such that the ground connections are the last to be broken or pulled apart. The pump cable shall be epoxy filled only around pumps leads to prevent water from entering the pump housing through the power cable. Epoxy is made into power cable from the manufacture with a cable grommet. The submersible pump shall be supplied with 30 or 50 feet of a multi-conductor cord of type SOOWX. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code.

**COOLING SYSTEM:**

Forty through sixty horsepower will be supplied with an adequately designed cooling system. The cooling jacket shall surround the stator housing providing heat dissipation of the motor. For pumps not submerged (dry pit) liquid shall be supplied to the cooling jacket from a fresh water source.

**SHAFT SEALS:**

Each pump shall be equipped with (3) seals. The lower seal shall be silicon carbide faces. The upper seal shall be of Carbon/Ceramic. The third seal shall be located between the lower seal and the impeller (Lip Seal) to prevent stringy material from entering lower seal.

**MOTOR CONSTRUCTION:**

The motor shall be Air filled water tight chamber and be capable of continuous operation underwater to a depth of 100 feet. The motor shall be designed for continuous duty and non-overloading throughout the entire pump curve. The motor is air filled, class F insulated, NEMA B design. At maximum load the winding temperature shall not exceed 120 degrees C while not submerged. Oil filled motors shall not be considered equal. Pump motors shall have an internal thermal overload device mounted on the windings which may or may not connect to a motor control relay located in the control panel.

**IMPELLER:**

The impeller shall be of ASTM-48 Class 35 gray cast iron and shall be of enclosed channel design. The impeller shall have a slip fit on the motor shaft and drive key and secured to the shaft by a stainless steel bolt.

**BEARINGS AND SHAFT:**

Upper and lower ball bearings shall be required. The bearings shall be a sealed single ball / race type bearing. Bearings that are lubricated by the same oil that is in the oil filled motors will not be accepted. Both bearings shall have a 65,000 hour life rating. The motor shaft shall be made of 420 stainless steel.

**QUICK REMOVAL SYSTEM:**

The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. The need for a protective coating shall not be required. A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection. Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel. Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump(s).

**FIBERGLASS WET WELL:**

The fiberglass wet well with an anti-flotation flange shall have the proper diameter and depth below the lowest inlet to promote proper cycling while maintaining the rim at grade. The fiberglass wet well shall be manufactured using a process that is filament wound and or chopped spray. The wet well shall be constructed with a anti flotation flange. Lifting lugs shall be required for those wet wells 48 inches in diameter and larger for setting of the wet well. The laminate shall have a Barco hardness of at least 90% of the resin manufactures minimum specified hardness for cured resin on both the interior and exterior surfaces. The minimum wall thickness of the wet well shall not be less than 1/4". Stainless steel studs will be encapsulated in the bottom of the wet well to allow the mounting of the quick removal system. The top rim flange will be a minimum of 2" wide to allow for the installation of the pedestrian rated aluminum cover to the rim flange or shall be rimless if the cover is specified for H20 off street locations. The wet well shall be provided with "unseal" fittings that can be installed in the field to insure proper elevation of the inlet, vent, and electrical on the side of the wet well. The wet well will house 2 - swing check valves, and 2 - shut off valves.

**COVER(S)**

The wet well cover shall always be gasketed and bolted to the rim flange of the fiber glass tank using 7/16" stainless steel hex head bolts unless the cover is to be in a H20 off street location. The type of material to be used for the cover shall be as indicated on this plan sheet.

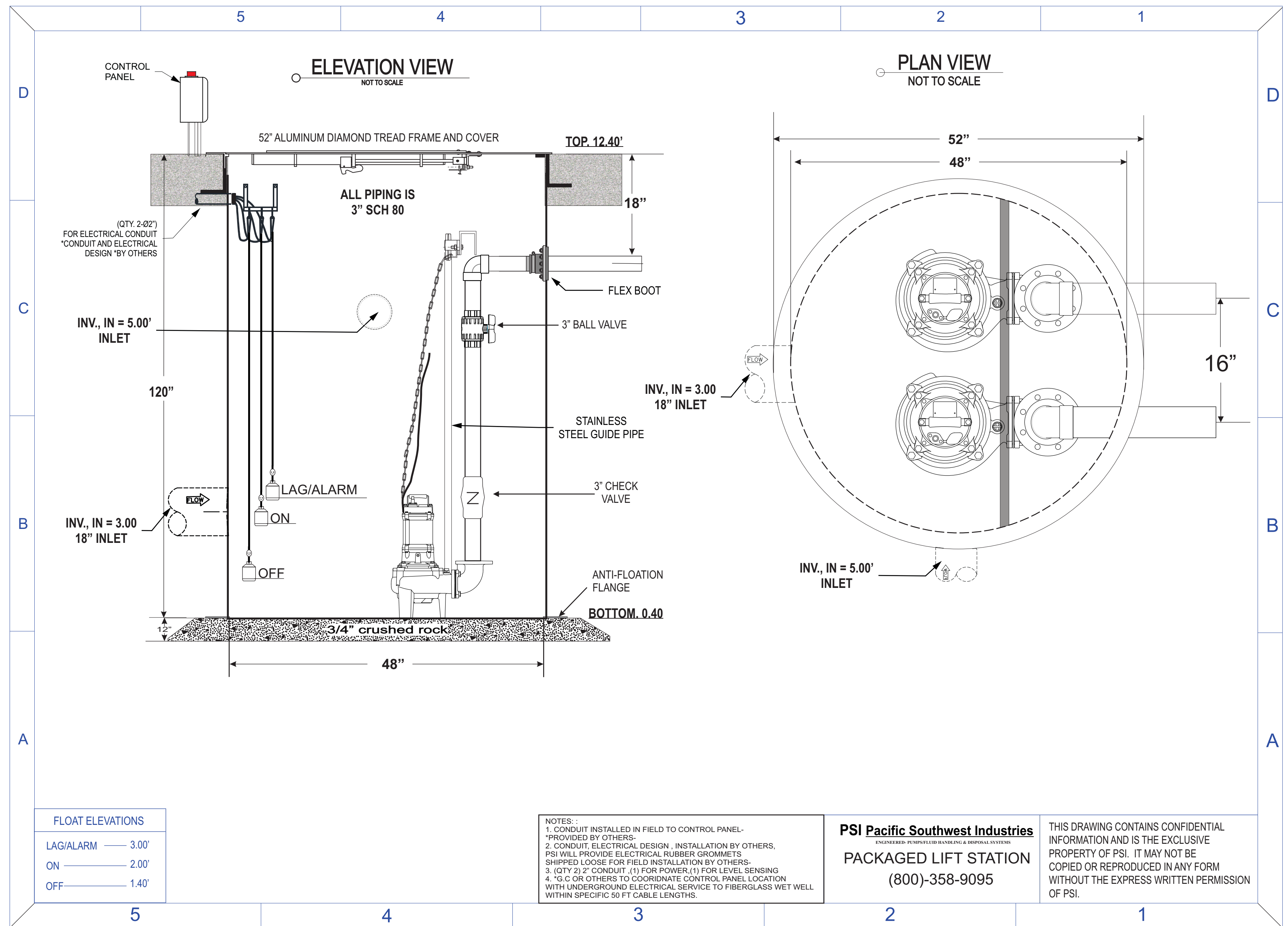
**DUPLEX ALTERNATING CONTROL PANEL:**

The duplex control panel, as a minimum, shall include the appropriate enclosure type for the environment it is to be installed in and should include the following: Motor starters, motor circuit protectors or variable frequency drives (VFD), pump run indicator(s).

operation selector switch(es), high water alarm and light, silence switch, dry contact for alarm, numbered terminals for all incoming power, pump motor(s) and level controls. The control panel shall be UL listed 508 or 913.

The following options marked "x" shall be included and specific for this site.

NEMA 4X  NEMA 3R \_\_\_ LEG KIT \_\_\_ ETM's \_\_\_ SEAL FAIL \_\_\_ THERMAL CUTOUTS \_\_\_ PHASE LOSS MONITOR \_\_\_ SOFT START \_\_\_ GENSET HOOKUP \_\_\_ DOOR IN DOOR DEAD FRONT \_\_\_ THROUGH DOOR MAIN DISCONNECT \_\_\_ TRANSDUCER OPERATED \_\_\_ FLOAT BACKUP \_\_\_ CURRENT CENSOR \_\_\_ AUTO DIALER \_\_\_ REDUNDANT OFF \_\_\_ INTRINSICALLY SAFE \_\_\_ SMART RELAY WHICH INCLUDES EXERCISER, RUN COUNT, ALARM COUNT AND FLOAT POSITION

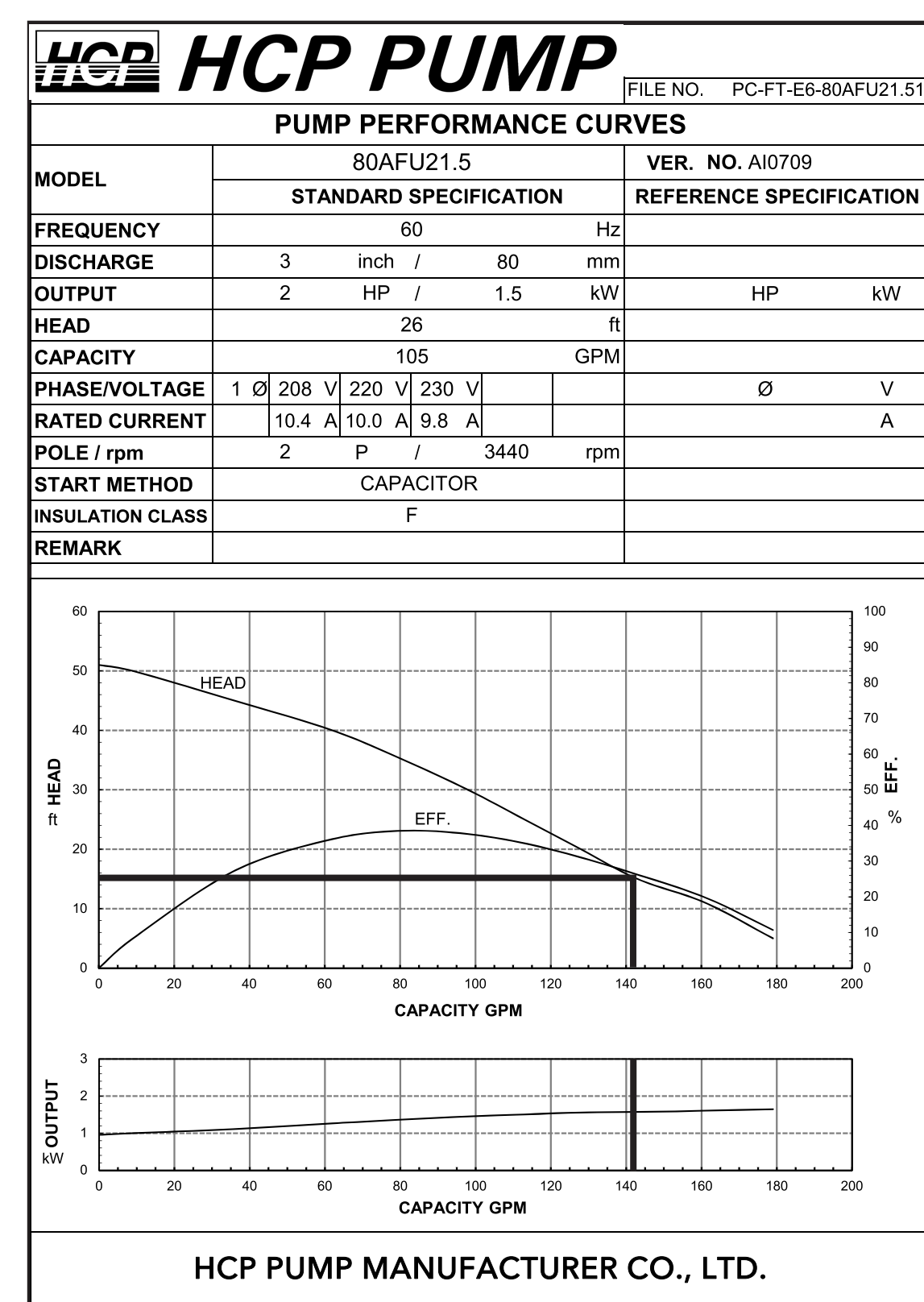


FLOAT ELEVATIONS	
LAG/ALARM	3.00'
ON	2.00'
OFF	1.40'

NOTES:  
1. CONDUIT INSTALLED IN FIELD TO CONTROL PANEL- PROVIDED BY OTHERS.  
2. CONDUIT ELECTRICAL DESIGN, INSTALLATION BY OTHERS. PSI WILL PROVIDE ELECTRICAL RUBBER GROMMETS SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS.  
3. (QTY 2) 2" CONDUIT (1) FOR POWER, (1) FOR LEVEL SENSING  
4. \*G.C OR OTHERS TO COORDINATE CONTROL PANEL LOCATION WITH UNDERGROUND ELECTRICAL SERVICE TO FIBERGLASS WET WELL WITHIN SPECIFIC 50 FT CABLE LENGTHS.

**PSI Pacific Southwest Industries**  
ENGINEERED - PUMPS/FLUID HANDLING & DISPOSAL SYSTEMS  
**PACKAGED LIFT STATION**  
(800)-358-9095

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HAZEN-WILLIAMS EQUATION/HEAD LOSS IN WATER PIPE			
$(f) = 0.2083 (100 / c)^{1.852} / d^{4.8655}$			
c=	140	HDPE / PVC	
q=	143	GPM	
dh=	3"	SCH 80 = 2.90	
3" FRICTION LOSS PER 100 FT = 6.17			
c=	140	HDPE / PVC	
q=	143	GPM	
dh=	4"	SCH 80 = 3.83	
4" FRICTION LOSS PER 100 FT = 1.59			
Velocity (ft/s) 3.98			

LIFT STATION PROFILE & CALCULATIONS			
3" SCH 40 = 3.048 SCH 80 = 2.90			
3" PVC PIPE	(QTY) 12	x	1 FT
3" PVC 90 ELBOW	(QTY) 1	x	8.1 FT
3" PVC 45 BEND	(QTY) 0	x	3.8 FT
3" PVC TEE	(QTY) 0	x	17 FT
3" BALL VALVE	(QTY) 1	x	1.7 FT
3" CHECK VALVE	(QTY) 1	x	20 FT
TOTAL EQUIVALENT LENGTH 41.8 FT			
FRICTION LOSS PER 100 FT 3" PVC 143 GPM 6.17 FT PER 100 FT			
FRICTION LOSS 3"	41.8	/	100 x 6.17 FT 2.58 FT
4" SCH 40 = 4.03 SCH 80 = 3.83			
4" PVC PIPE	(QTY) 20	x	1 FT
4" PVC 90 ELBOW	(QTY) 0	x	11 FT
4" PVC 45 BEND	(QTY) 2	x	5 FT
4" PVC TEE	(QTY) 0	x	21 FT
TOTAL EQUIVALENT LENGTH 30 FT			
FRICTION LOSS PER 100 FT 4" PVC 143 GPM 1.59 FT PER 100 FT			
FRICTION LOSS 4"	30	/	100 x 1.59 FT 0.48 FT
TOTAL DYNAMIC HEAD			
3" FRICTION LOSS 2.58 FT			
4" FRICTION LOSS 0.48 FT			
COMBINED 3" AND 4" FRICTION LOSS 3.05 FT			
STATIC HEAD + 12.00 FT			
PERFORMANCE 143 GPM @ 15.05 FT TDH THROUGH 4" PVC LINE			

**LIFT STATION DETAILS**

**PSI Pacific Southwest Industries**  
ENGINEERED - PUMPS/FLUID HANDLING & DISPOSAL SYSTEMS  
18841 COLLIER AVE., LAKE ELSINORE, CA 92530 PH: 800-358-9095

Description	Date	No.	Scale: NTS	Sheet No.
			08/16/22	DM
			Drawn by:	1 OF 1
			Checked by:	

LIFT STATION DETAILS  
B.I.G PATTERSON INDUSTRIAL

**LSD-1**