

Appendix J

Stormwater Compliance Study

STORMWATER COMPLIANCE STUDY

FOR PARCEL MAP: 4013

(FOR PLANNING AND ZONING PERMIT ###)

1300 Lawrence Drive
Thousand Oaks, CA 91320

Prepared for:

Cruzan
9171 Wilshire Blvd
Beverly Hills, CA 90210

Project No: LAX20-0077

Prepared by:



Signature

08-18-2022

Date

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Prepare Date: August 18, 2022

Revised:

Table of Contents

I. Project Description	3
II. References.....	3
III. Objectives.....	3
IV. Procedure.....	3
V. Stormwater Quality.....	4
VI. Conclusions	6
Appendix A – Vicinity Map.....	
Appendix B – BMP Information.....	
Appendix C – Geotechnical Report and Percolation Test.....	
Appendix D – LID and Grading Plan	
Appendix E – Soil Map.....	
Appendix F – Environmental Sensitive Area Map.....	
Appendix G –VenturaTC Calculations	

I. Project Description

Background

The project is located at 1300 Lawrence Drive, Thousand Oaks, CA. The total project area is 6.64 +/- acres.

The site is bounded by Corporate Center Drive to the north, commercial property to the east and south, and Lawrence Drive to the west. The site is currently an existing parking lot. See Appendix A for the Vicinity map and legal description of the property.

The proposed project will demolish the existing parking lot, construct new industrial building, access roadway and parking lot, landscaped areas, and hardscape improvements.

Existing Drainage Condition

Currently, there are no water quality treatment devices on the property.

The current parking lot drains into concrete gutters spread throughout the site that flow into two catch basins located at the northwest corner. The flows are then conveyed into a public catch basin at the southeast corner of Corporate Center Drive and Lawrence Drive via an 18" storm drain pipe. There is an approximately 4' wide landscaping area along the eastern property line that surface flows into a concrete channel located on the adjacent property. The concrete channel flows northeasterly towards Corporate Center Drive where it discharges through a parkway drain. Along the Northeast and Northwest property lines, there are landscaped slope along the site perimeter. This landscaped area sheet flows into both Corporate Center Drive and Lawrence Drive.

The project site is underlain by Diablo Clay (Soil Type 1), Rincon silty clay loam (Soil Type 2), and Vina loam (Soil Type 5). See Appendix E for soil map. The site is not located near environmentally sensitive habitat areas. See Appendix F for environmental sensitive habitat areas map.

Proposed Drainage Condition

For the proposed condition, the overall drainage pattern will remain unchanged. Stormwater will drain into proposed onsite gutters and be collected by series of onsite catch basins. The stormwater will then be treated and discharged into an existing 18" storm drain line at the northwestern portion of the site. The existing 18" storm drain line joins the public storm drain line by connecting into the catch basin at the corner of Lawrence Drive and Corporate Center Drive.

II. References

- a. "Ventura County Design Hydrology Manual," Ventura County Watershed Protection District, Updated 2017.
- b. "Ventura County Technical Guidance Manual for Stormwater Quality Control Measures," Ventura Countywide Stormwater Quality Management Program, Updated June 2018.

III. Objectives

The purpose of this stormwater compliance study is to discuss the long-term post-construction Best Management Practices (BMPs) that will be implemented to mitigate the impacts of development.

IV. Procedure

Per Ventura Technical Guidance Manual, section 1.5, the project falls within the following listed new development project conditions: industrial parks with 10,000 square feet or more of total altered surface area and parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more

parking spaces. As a result, the project requires post-construction storm water management control measures.

Soil properties were identified through field investigation to determine available treatment methods, i.e., if infiltration is feasible. The Stormwater Quality Design Flow was calculated by following the technical guidance manual. BMPs were sized based off the calculated treatment flows. Part V goes into more technical detail.

V. Stormwater Quality

Since the proposed project will disturb more than 50% of the existing impervious area, stormwater from the entire project area is required to be treated.

Pollutants of concern anticipated for the project are sediment (TSS and Turbidity), Nutrients, Pesticides, Organic Materials/Oxygen Demanding Substances, Oil and Grease, Organics Associated with Petroleum, Bacteria and Viruses, and Trash and Debris.

The project area disturbs a total of 6.64 acres. Pre and post construction impervious and pervious areas are summarized in the table below.

	Impervious Area (acres)	Pervious Area (acres)
Existing Condition	6.10	0.54
Proposed Condition	5.82	0.82

Section 3.1 of the Ventura County Technical Guidance Manual lists several conditions where a project can be subjected to infiltration BMPs. One of these conditions specifies a minimum infiltration rate of 0.5 in/hr. Per percolation tests performed on site, the measured infiltration rate is 0.07 in/hr and the design infiltration rate is 0.02 in/hr. Therefore, infiltration is not feasible onsite. See Appendix C for geotechnical report and percolation test results.

Since infiltration is infeasible, biofiltration will be used to treat the stormwater. With biofiltration, the project is required to treat the Stormwater Quality Design Flow, or SQDF.

The Stormwater Quality Design Flow, SQDF, was calculated using Method 1 (runoff produced by 0.2 inches per hour rainfall intensity) per the technical guidance manual. The time of concentration for the 50-year storm is 17 minutes and flow-based biofiltration BMP design intensity for 150% has been applied. See calculations below.

See Appendix G for VenturaTC calculator results for post-development 50-year storm.

Determine Water Quality Design Flow	
1-1. Enter watershed area	A = 6.64 acres
1-2. Enter rainfall intensity (in/hr) (0.2in/hr) Table 2.1, with tc=17 minutes, i=0.268	i = 0.268 in/hr
1-3. Enter impervious fraction, <i>imp</i>	<i>imp</i> = 0.8765
1-4. Determine pervious runoff coefficient using Table E-1, C_p	C_p = 0.05 (Soil Type 5)
1-5. Calculate the runoff coefficient, $C = 0.95*imp + C_p(1-imp)$	C = 0.839
1-6. Calculate the water quality design flow (cfs), $SQDF = CiA$ Note: 1 acre-in/hr = 1.0083 cfs	$SQDF$ = 1.49 acre in/hr or 1.51 cfs

To treat SQDF, the three modular wetland systems will be installed on site. Modular wetland systems A-1, A-2, and A-3 will treat 0.56, 0.32, and 0.63 CFS of runoff, respectively. Prior to the biofiltration systems, runoff will be pretreated using catch basin filters at each inlet. See Appendix D for the LID plans identifying the LID drainage boundaries. See Appendix B for modular wetland system and full capture filter details and sizing information.

Due to the fall that exists across the site, and the invert elevation of the existing 18" storm drain and catch basin, a pump will be required to empty discharge the flow through the biofilters. Due to the depth of the biofiltration outlets and the join inverts, there is no way to get stormwater to flow by gravity from the site. A pump will be installed after the biofiltration systems to raise the flow above the existing catch basin that the site currently discharges to. After the pump, the stormwater will gravity flow off of the site.

The pump will only be required for the low flows that are required to be treated. High flows, beyond what is required to be treated, will be diverted prior to the biofiltration systems. The inverts of the high flow storm drain lines will allow them to discharge from the site via gravity flow and connection in the existing catch basin. See Appendix B for pump details and sizing information.

See Appendix D for LID and Grading Plans.

The VenturaTC calculator was used to calculate the runoffs for the existing and proposed condition. Pre and post construction runoffs are summarized in the table below.

	10-year storm (CFS)	25-year storm (CFS)	50-year storm (CFS)
Existing Condition	11.31	14.36	17.18
Proposed Condition	7.57	9.69	11.63

Flows discharging from the site and into the public storm drain are required to be limited to the existing 10-year storm flow rate, 11.31 CFS. Pipe sizing and orifice control will be used to limit the flows discharging the site to 11.31 CFS.

See Appendix G for VenturaTC calculator results for the pre and post development storm events. To control the discharge flow, an orifice will be sized to ensure that the maximum flow rate that enters the public system is 11.31 CFS.

VI. Conclusions

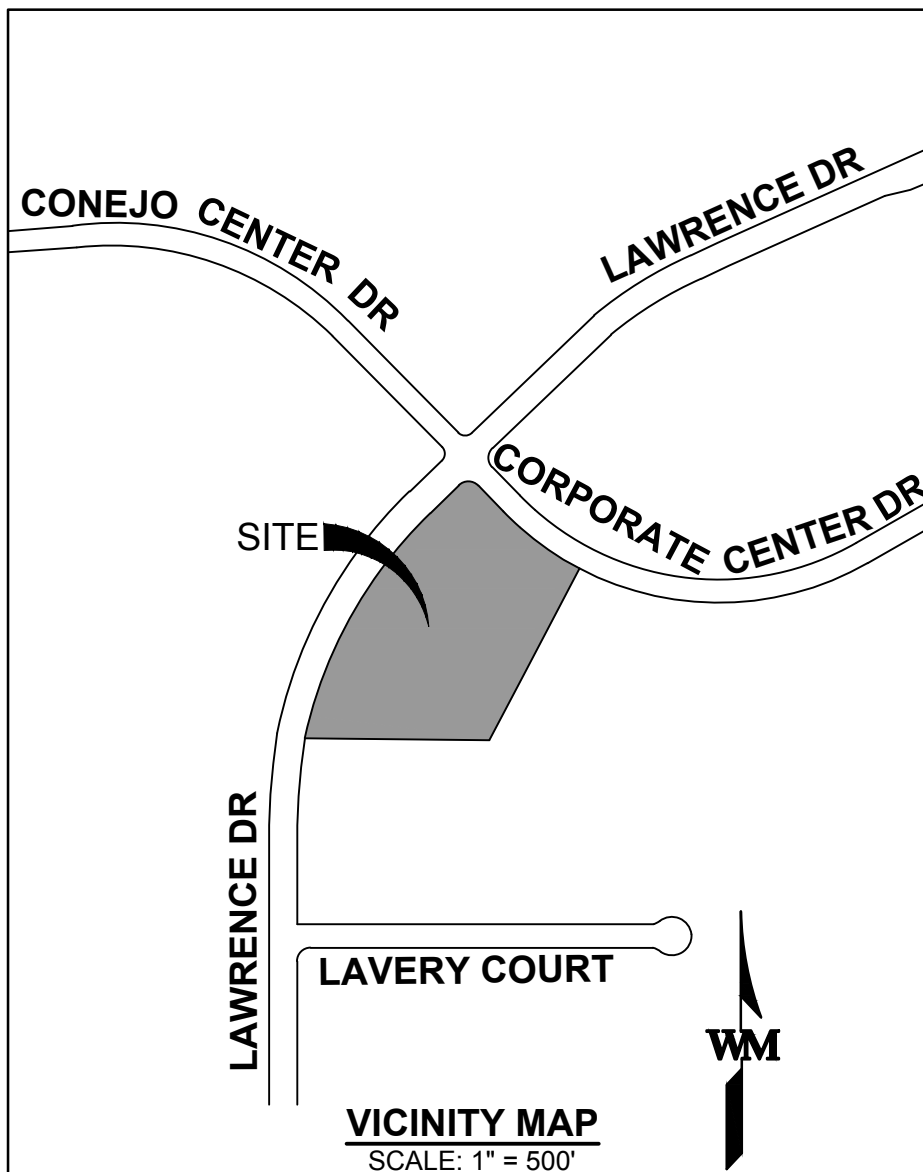
The proposed development will have storm drain and water quality facilities to treat the required amount of stormwater and to mitigate the impact on existing downstream facilities.

For stormwater treatment, three (3) Modular wetland systems will be installed to treat the SQDF. The treated water will then need to be pumped from the site in order to join the catch basin at the southeast corner of Lawrence Drive and Corporate Center Drive. High flows that bypass treatment will be able to gravity flow from the site.

To mitigate downstream impacts, the site cannot discharge flows greater than the existing 10-yr flow rate. Pipe sizes and orifices will be implemented on site and sized to limit the stormwater discharge.

The project has been designed to comply with all requirements of the Ventura County Technical Guidance Manual for Stormwater Quality Control Measures.

Appendix A – Vicinity Map



LEGAL DESCRIPTION:

REAL PROPERTY IN THE CITY OF THOUSAND OAKS, COUNTY OF VENTURA, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCELS 1, 2 AND 3 OF PARCEL MAP NO. 4013, IN THE CITY OF THOUSAND OAKS, COUNTY OF VENTURA, STATE OF CALIFORNIA, AS PER MAP FILED IN BOOK 41, PAGES 13 TO 15 INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AS MAY HAVE BEEN AMENDED BY THAT CERTIFICATE OF CORRECTION EXECUTED BY JAMES C. ROACH, DATED JANUARY 08, 1987, RECORDED ON JANUARY 21, 1987 AS INSTRUMENT NO. 1987-8920 OF OFFICIAL RECORDS.

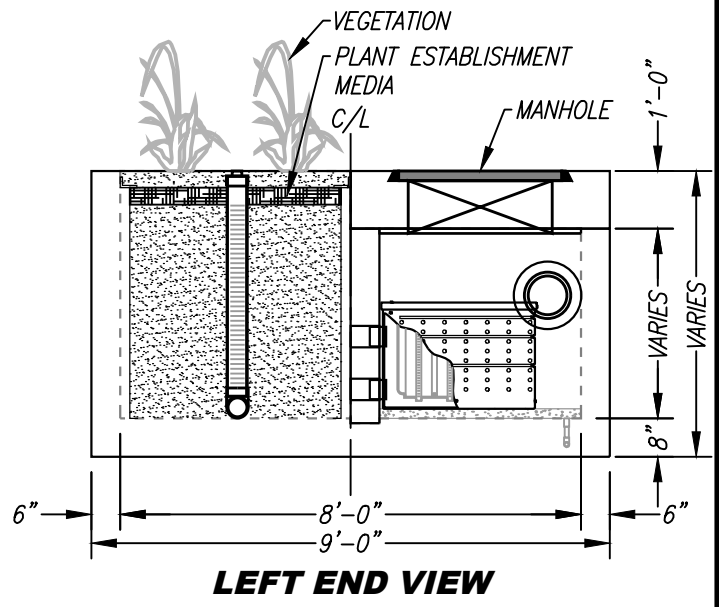
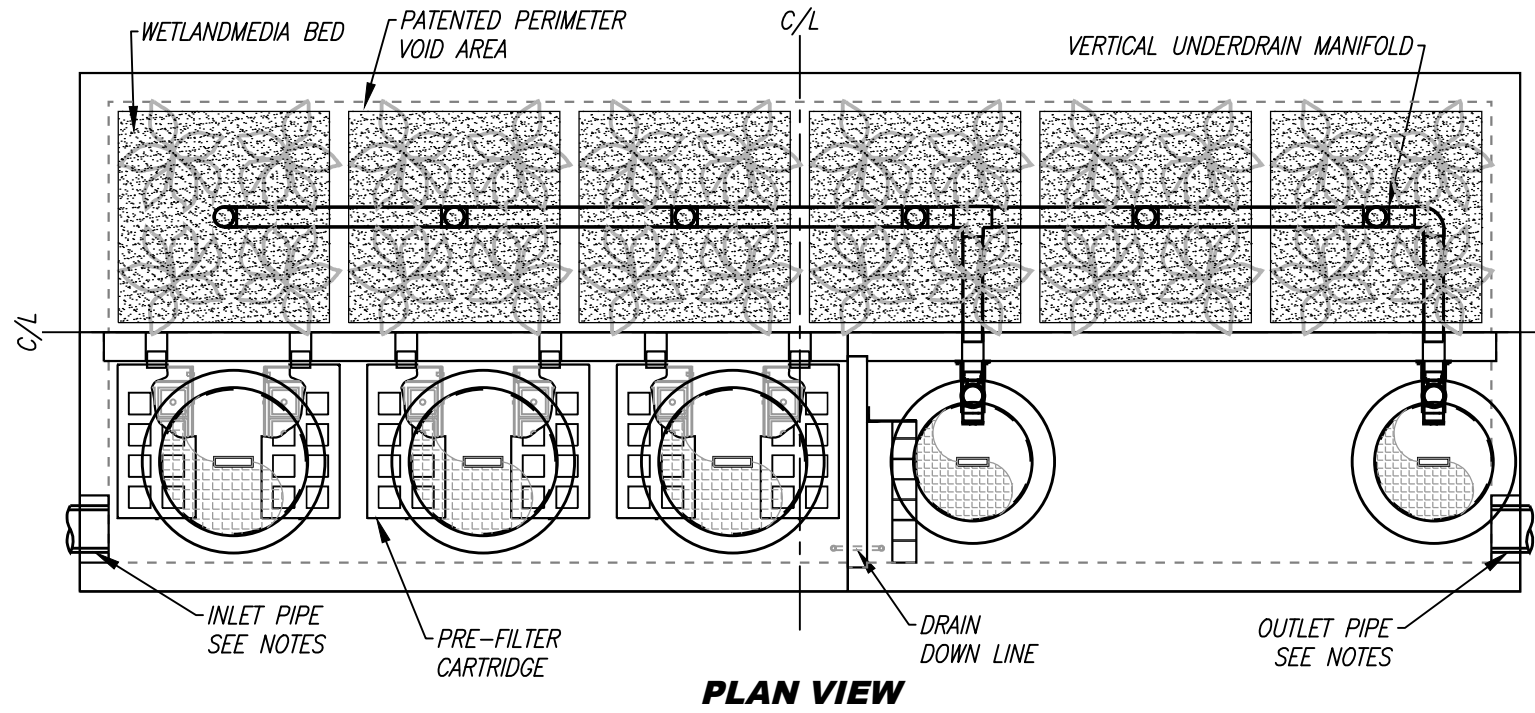
EXCEPT ALL OIL, GAS AND HYDROCARBON SUBSTANCES IN, UNDER AND UPON SAID LAND, WITHOUT THE RIGHT TO DRILL, DIG OR MINE THROUGH THE SURFACE OF SAID LAND THEREFOR, AND WITHOUT THE RIGHT TO ENTER OR ENCROACH UPON ANY PORTION OF SAID LAND LYING WITHIN 500 FEET OF THE SURFACE, RECORDED IN BOOK 1592, PAGE 511, RE-RECORDED BOOK 1712, PAGE 32, JANUARY 30, 1958 IN BOOK 1586, PAGE 229, ALL OF OFFICIAL RECORDS.

ALSO EXCEPT ALL SURFACE AND UNDERGROUND WATER AND WATER RIGHTS IN, ON AND UNDER SAID LAND, AS GRANTED TO RANCHO CONEJO MUTUAL WATER CO., IN DEED RECORDED OCTOBER 6, 1959, IN BOOK 1784 PAGE 393, OF OFFICIAL RECORDS, AND RE-RECORDED ON DECEMBER 17, 1959 IN BOOK 1808 PAGE 175, OF OFFICIAL RECORDS.

APN: 667-0-172-015 (AFFECTS: PARCEL 1), 667-0-172-025 (AFFECTS: PARCEL 2)
667-0-172-035 (AFFECTS: PARCEL 3)

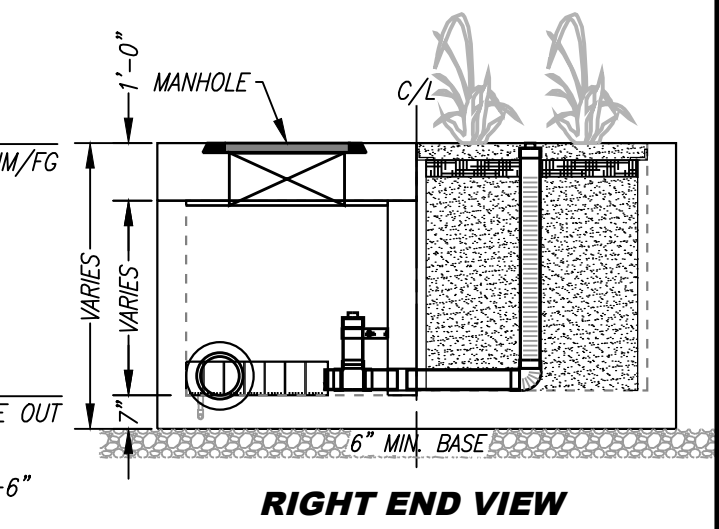
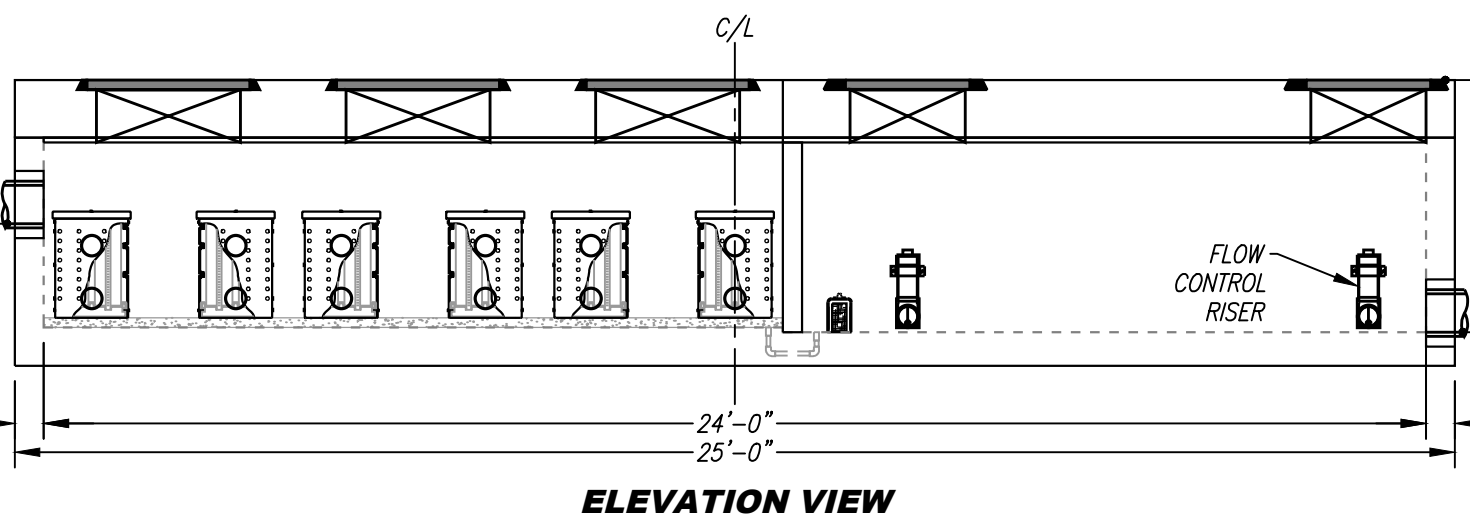
Appendix B – BMP Information

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD			
FRAME & COVER	3EA Ø30"		2EA Ø24"
NOTES:			



INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS 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 TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.



GENERAL NOTES

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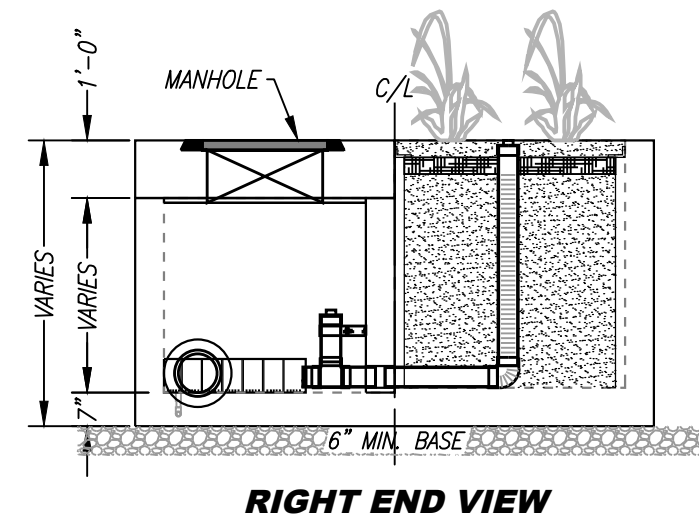
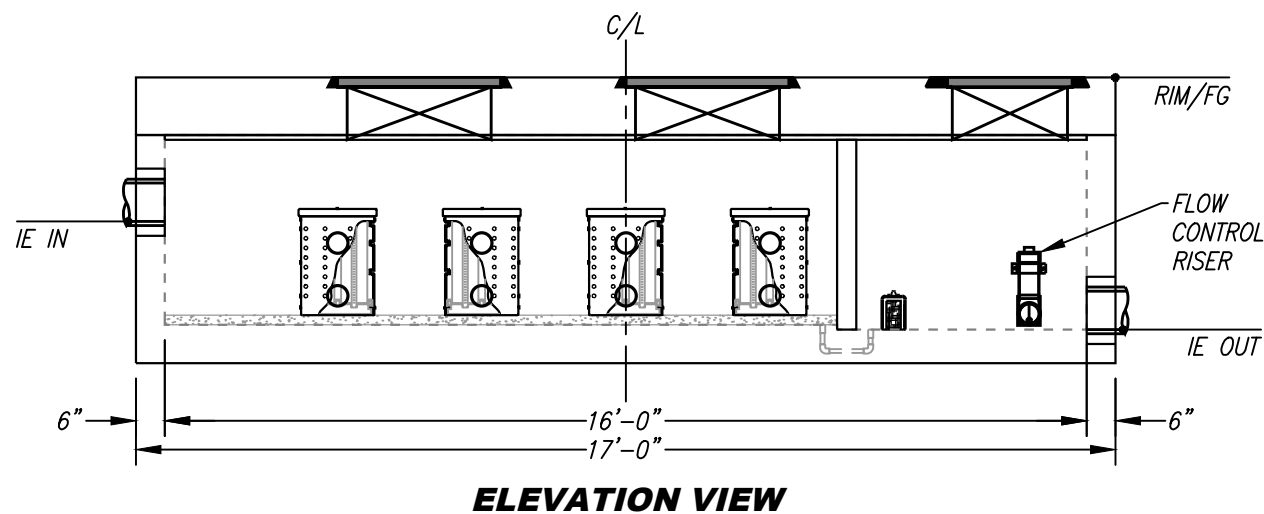
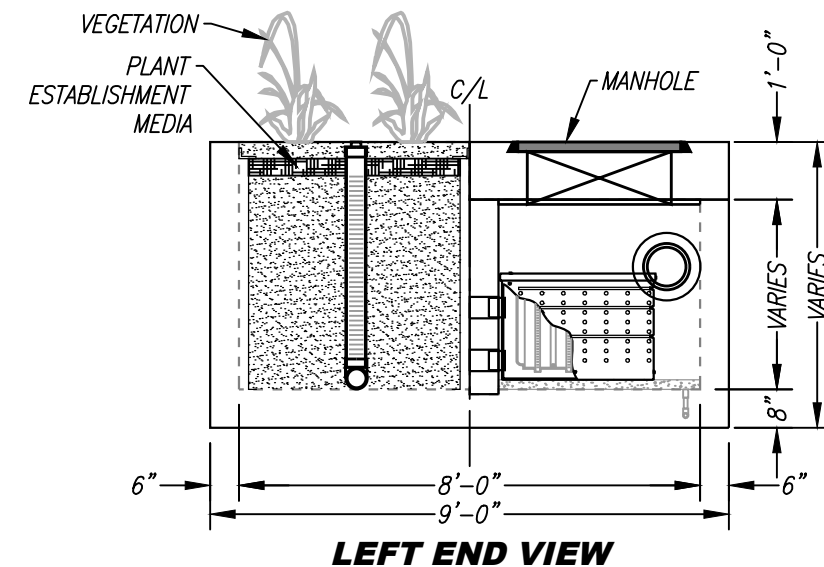
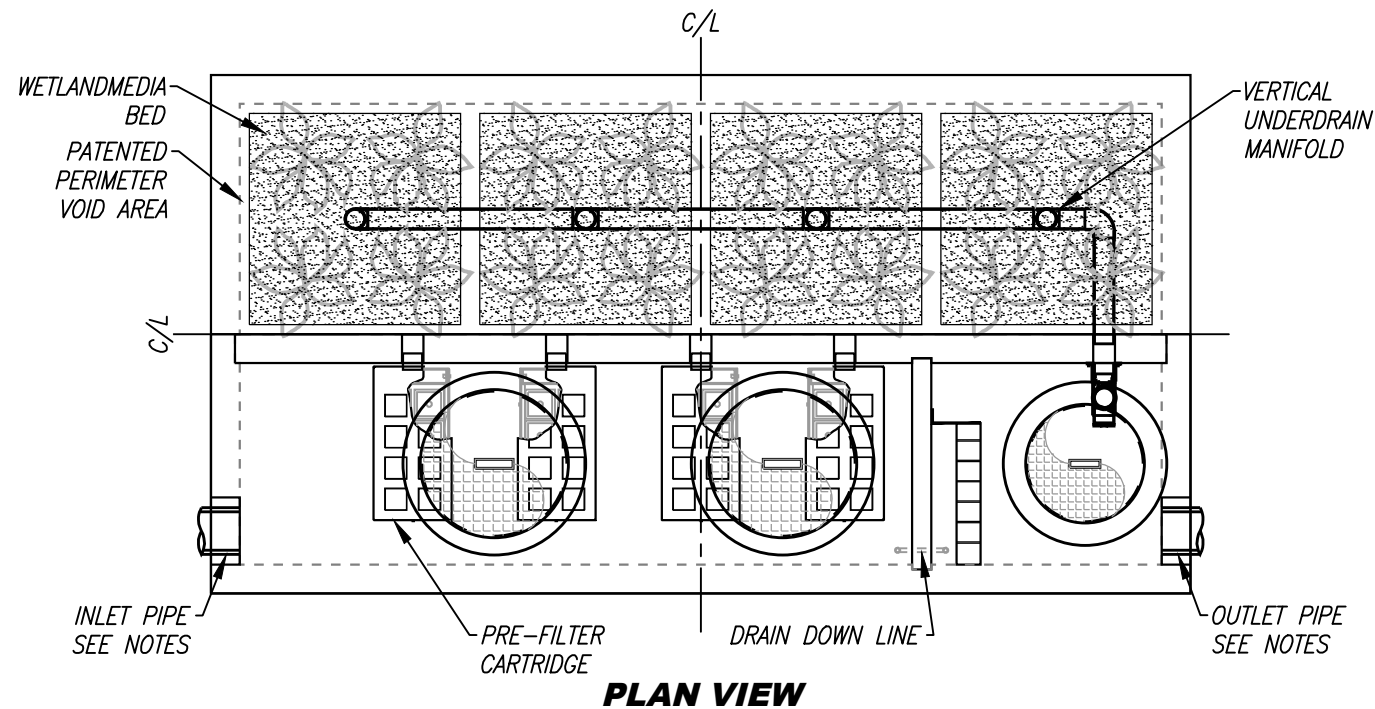


TREATMENT FLOW (CFS)	
OPERATING HEAD (FT)	
PRETREATMENT LOADING RATE (GPM/SF)	
WETLAND MEDIA LOADING RATE (GPM/SF)	

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

5/23/19TOLFE

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD			
FRAME & COVER	2EA $\phi 30"$		$\phi 24"$
NOTES:			



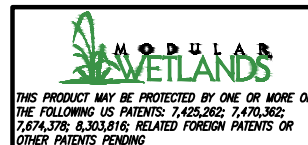
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TREATMENT FLOW (CFS)	
OPERATING HEAD (FT)	
PRETREATMENT LOADING RATE (GPM/SF)	
WETLAND MEDIA LOADING RATE (GPM/SF)	

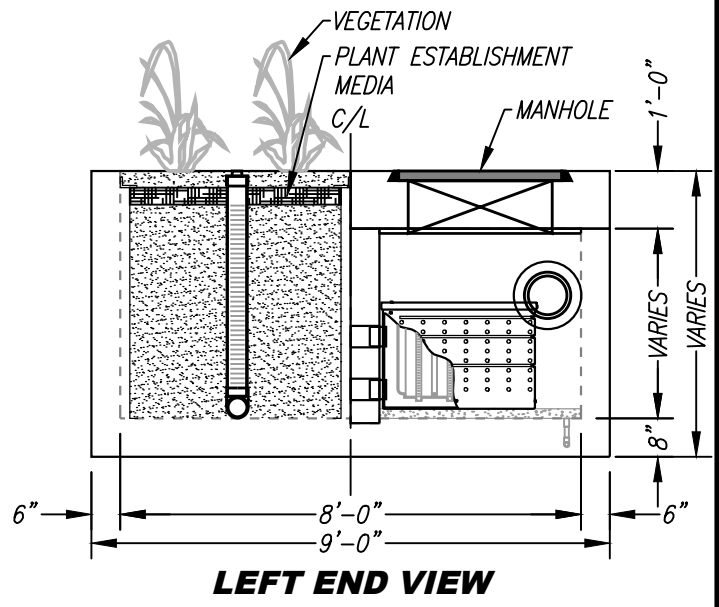
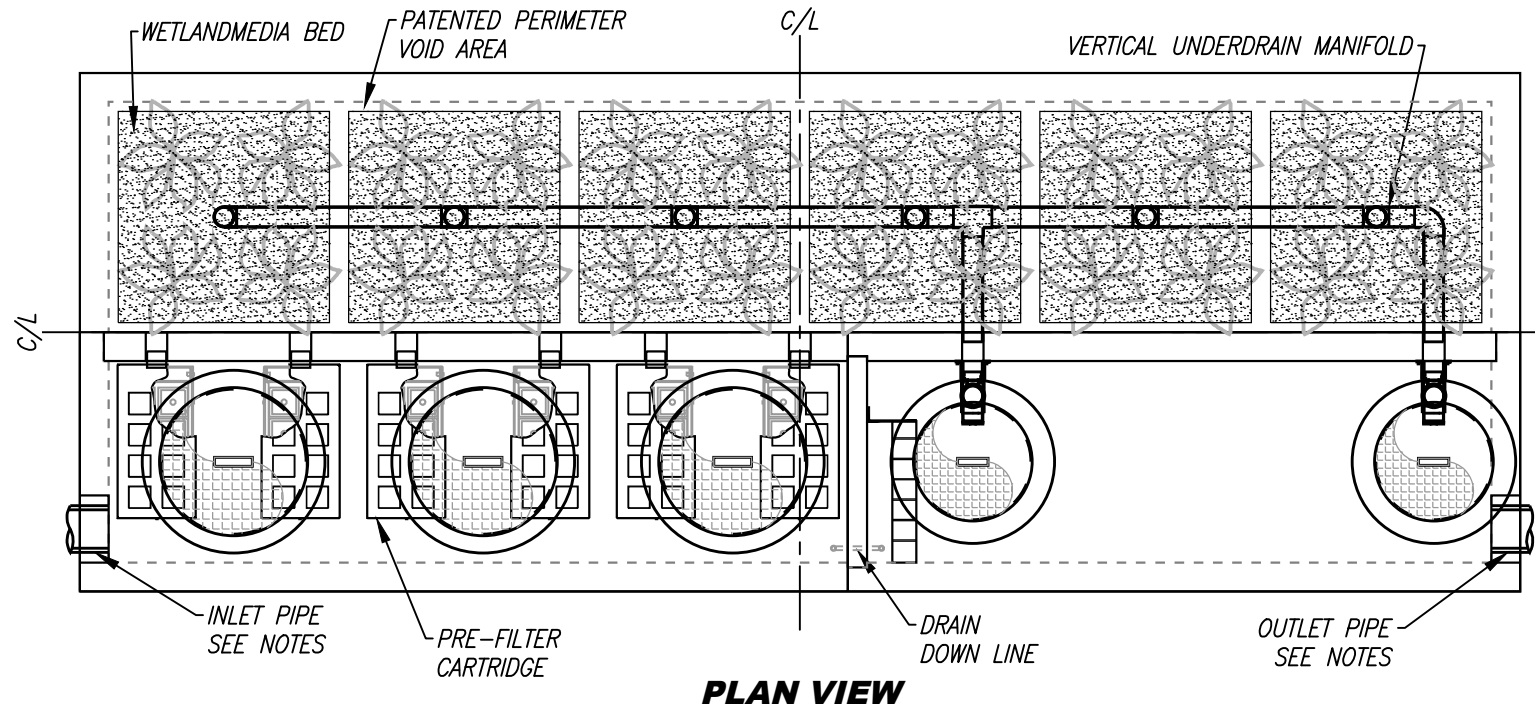


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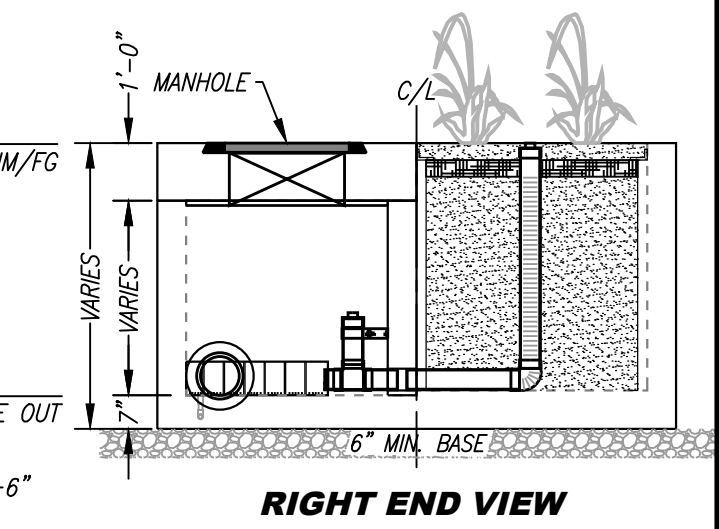
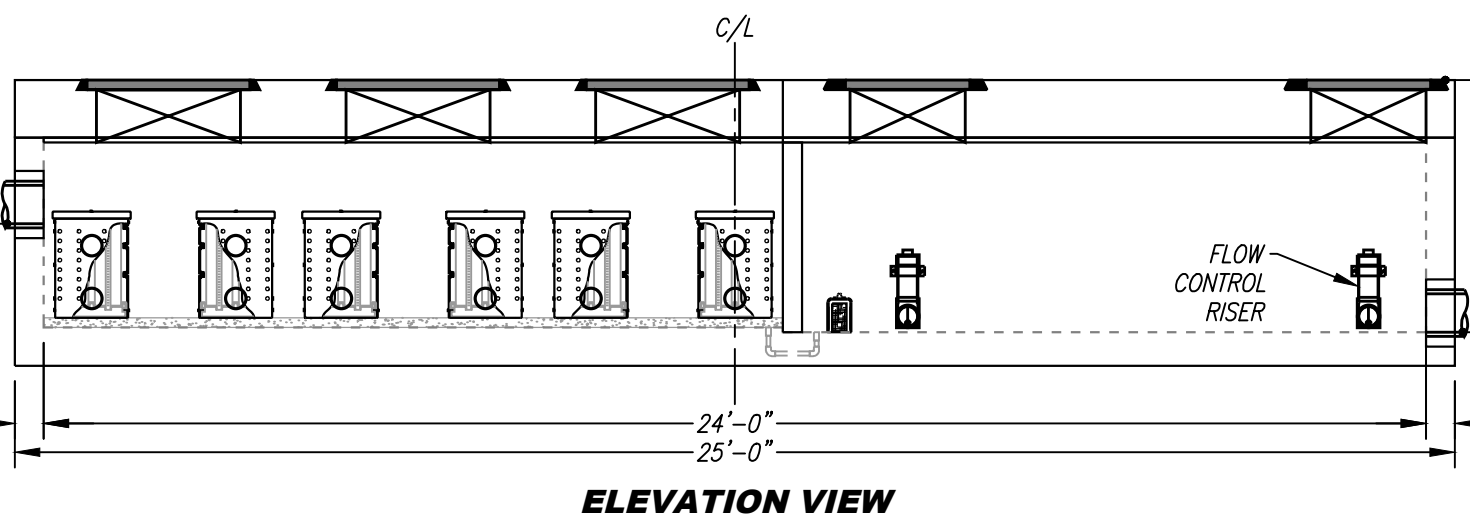
MWS-L-8-16-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
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OUTLET PIPE			
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SURFACE LOAD			
FRAME & COVER	3EA Ø30"		2EA Ø24"
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TREATMENT FLOW (CFS)	
OPERATING HEAD (FT)	
PRETREATMENT LOADING RATE (GPM/SF)	
WETLAND MEDIA LOADING RATE (GPM/SF)	

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

5/23/19TOL/EE

PACKAGED PUMP LIFT STATION
LAX022-0077
1300 LAWRENCE DR. THOUSAND OAKS, CA. 91320

Furnish and install complete pre-packaged duplex Lift Station model #PSI-WAR081622 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 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(S):

Furnish and install Tsurumi, VANC'S series submersible pump(s). Each unit shall be designed to pump waste water, sewage or effluent containing 1.5-inch (40mm) diameter solids without damage during operation. The pump(s) shall be designed so that the shaft power required (BHP) / (kW) shall not exceed the motor rated output throughout the entire operating range of the pump performance curve. A two-year warranty "out of the box" shall be standard.

MATERIALS OF CONSTRUCTION:

Construction of major parts of the pumping unit(s) including pump casing, impeller, motor head cover and intermediate brackets shall be manufactured from recyclable, application appropriate resins. The need for a protective coating shall not be required. All exposed fasteners shall be stainless steel and shall have stainless mating anchors integrally cast into the mating part. All units shall be furnished with a NPT discharge companion flange. Impellers shall be of the multi-vane, semi-vortex, solids handling design and shall be slip fit to the shaft. The motor shaft shall be machined to provide a positive drive of the impeller. The pump casing shall incorporate an air relief valve.

MECHANICAL SEAL:

All units shall be furnished with a dual inside mechanical shaft seal located completely out of the pumpage, running in a separate oil filled chamber. Units shall be fitted with a device that shall provide positive lubrication of top mechanical seal, (down to one third of the standard oil level). The device shall not consume any additional electrical power. Units shall have silicon carbide mechanical seal faces. Mechanical seal hardware shall be stainless steel.

MOTOR:

Motor(s) shall have a 1.15 service factor and shall be rated for 10 starts per hour. Motor(s) shall be air filled, copper wound, class E insulated with built-in thermal protection. Motor shaft shall be 403 stainless steel and shall be supported by two permanently lubricated, high temperature ball bearings, with a B-10 life rating at best efficiency point of 60,000 hours. The bearings shall be single row, double shielded, C3, deep groove type ball bearings. Bearing seats shall be rolled carbon steel or aluminum die casting. Motor housing shall be 304 stainless steel. Motors shall be suitable variable speed applications, utilizing a properly sized variable frequency drive.

POWER CABLE AND CABLE ENTRANCE:

The pump power cable shall be suitable for submersible pump applications. The cable entrance shall incorporate built in strain relief, a one-piece, three-way mechanical compression seal with a fatigue reducing cable boot. The cable entrance assembly shall contain an anti-wicking block to eliminate water incursion into the motor due to Capillary wicking should the power cable be accidentally damaged.

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.

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 an 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 manufacturers 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 valve box will house 2 - swing check valves, and 2 - shut off valves.

COVER(S):

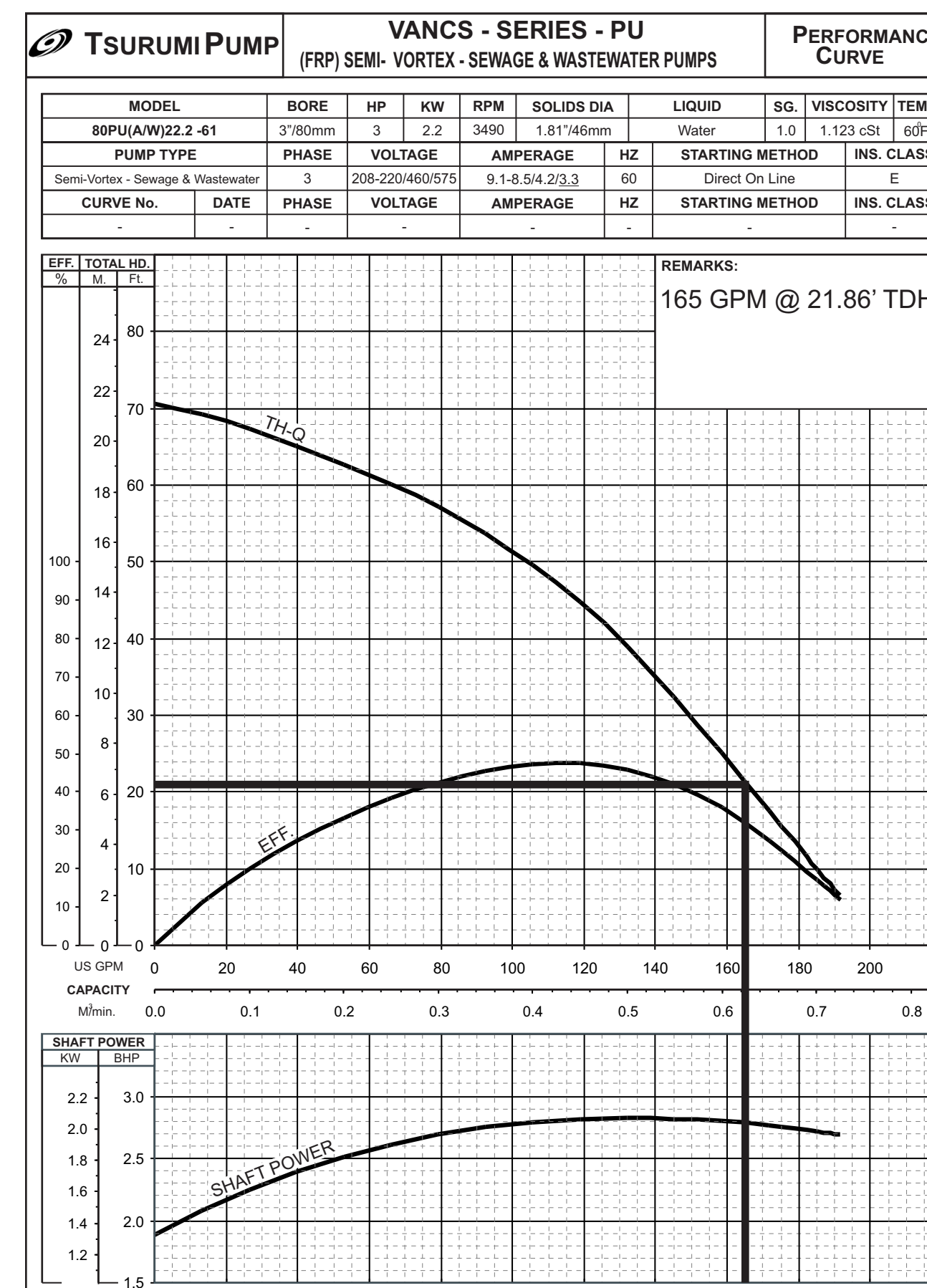
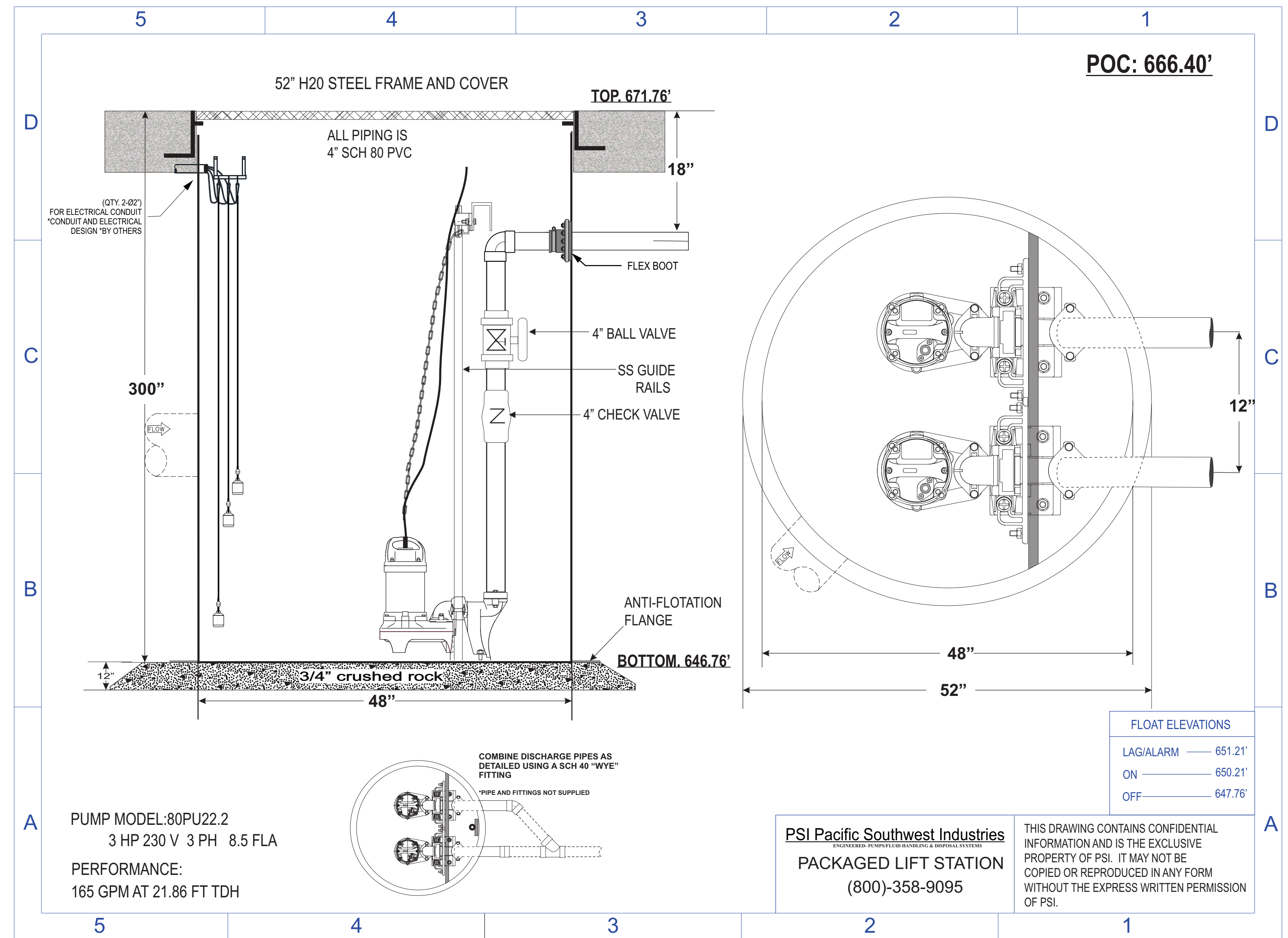
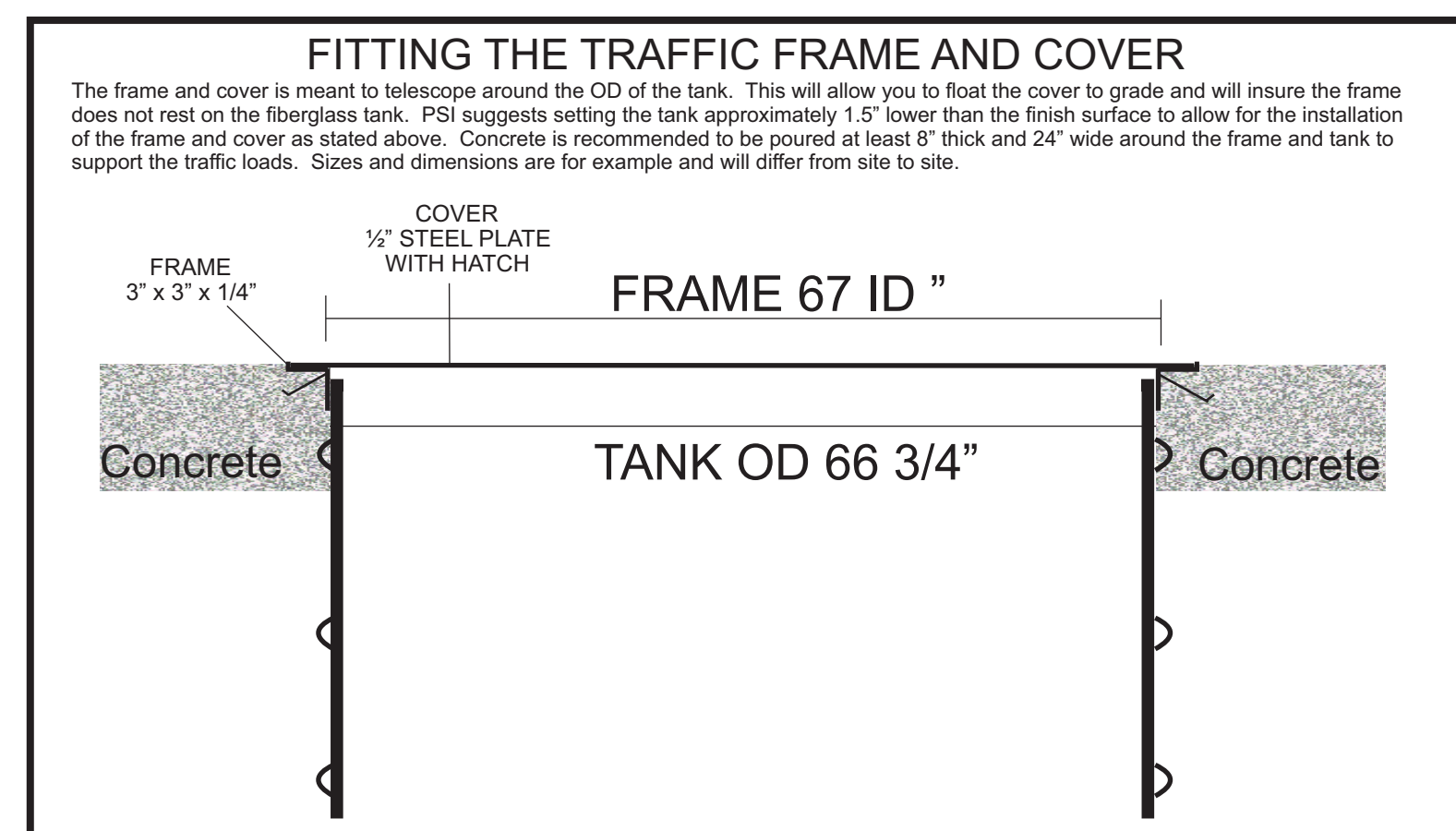
The wet well cover shall always be gasketed and bolted to the rim flange of the fiber glass tank using 7/16" stainless steel hex head bolts unless the cover is to be in a H2O off street location. The type of material to be used for the cover shall be as indicated on this plan sheet.

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



LIFT STATION PROFILE & CALCULATIONS			
4" SCH 40 = 4.03 SCH 80 = 3.83			
4" PVC PIPE	(QTY)	50	x 1 FT = 50 FT
4" PVC 90 ELBOW	(QTY)	2	x 11 FT = 22 FT
4" PVC 45 BEND	(QTY)	2	x 5 FT = 10 FT
4" PVC TEE	(QTY)	0	x 21 FT = 0 FT
4" BALL VALVE	(QTY)	1	x 2.7 FT = 2.7 FT
4" CHECK VALVE	(QTY)	1	x 22 FT = 22 FT
TOTAL EQUIVALENT LENGTH		106.7 FT	
FRICTION LOSS PER 100 FT 4" PVC	165 GPM	2.1 FT	PER 100 FT
FRICTION LOSS 4"	106.7	/ 100	x 2.1 FT = 2.22 FT
TOTAL DYNAMIC HEAD			
4" FRICTION LOSS		2.22 FT	
STATIC HEAD		19.64 FT	
PERFORMANCE		165 GPM @ 21.86 FT TDH THROUGH 4" PVC LINE	

HAZEN-WILLIAMS EQUATION/HEAD LOSS IN WATER PIPE	
(f) = 0.2083 (100 / c) ^{1.852} q ^{1.852} / dh ^{4.8655}	
c =	140 HDPE / PVC
q =	165 GPM
dh =	4" SCH 80 = 3.83
FRICTION LOSS PER 100 FT f =	2.08
Velocity (ft/s) =	4.60

STORM PUMP SYSTEM

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

Description
Date
No.

LIFT STATION DETAILS
1300 LAWRENCE DR.
THOUSAND OAKS, CA. 91320

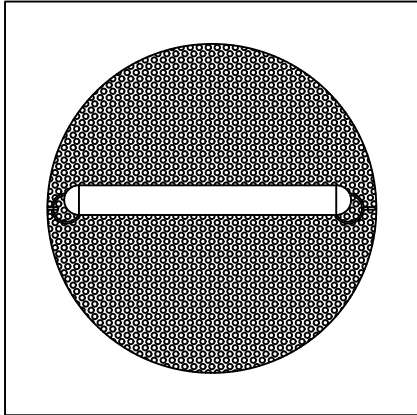
Date: 08/16/22
Drawn by: EM
Checked by:

Scale: NTS
Sheet No. 1 OF 1

LSD-1

BIO CLEAN FULL CAPTURE FILTER

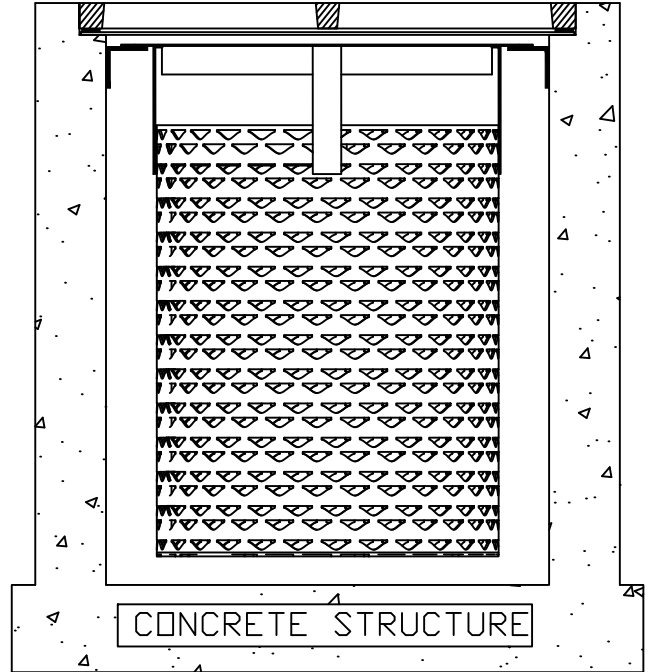
FOR USE IN GRATE INLETS



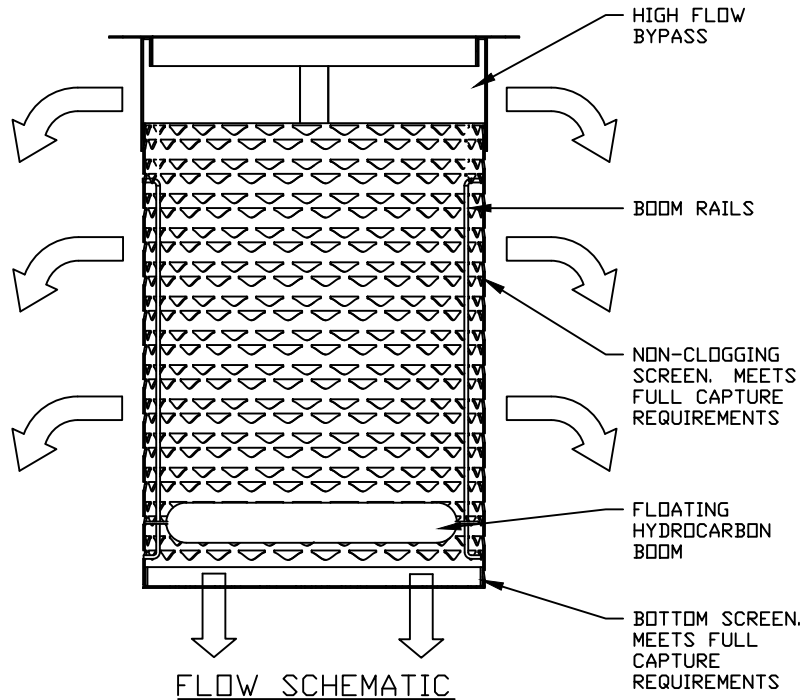
TOP VIEW

NOTES:

1. ALL HARDWARE, FLANGE, FRAME, SCREENS SHALL BE STAINLESS STEEL
2. HYDROCARBON BOOM SHALL BE 2" DIAMETER AND CONNECTED, MECHANICALLY TO THE FILTER FRAME WITH RAILS ALLOWING IT TO FLOAT ON THE WATER SURFACE REGARDLESS OF HEIGHT
3. SEE PERFORMANCE REPORTS IN MANUFACTURES SPECIFICATIONS
4. OTHER STANDARD AND CUSTOM MODEL SIZES AVAILABLE - CONTACT BIO CLEAN FOR MORE INFORMATION.
5. BASED ON 37% OPEN AREA.
6. CONSIDERS A SAFETY FACTOR OF 2.0.
7. CONSIDERS A LOCAL DEPRESSION PONDING DEPTH OF 6 INCHES.
8. STORAGE CAPACITY BASED ON THE BASKET HALF FULL.
9. CONCRETE STRUCTURES SOLD SEPARATELY.



CONCRETE STRUCTURE



FLOW SCHEMATIC

MODEL #	TREATMENT FLOW (CFS)	BYPASS FLOW (CFS)	SOLIDS STORAGE CAPACITY (CF)
BIO-GRATE-FULL 12-12-12	0.97	1.55	0.14
BIO-GRATE-FULL 18-18-12	1.86	3.68	0.35
BIO-GRATE-FULL 26-26-12	2.78	4.83	0.60
BIO-GRATE-FULL 24-40-12	6.71	6.59	1.04
BIO-GRATE-FULL 26-26-24	9.49	4.83	1.80
BIO-GRATE-FULL 24-40-24	13.53	6.59	3.12
BIO-GRATE-FULL 36-36-24	17.14	7.60	4.45

DRAWING: BIO CLEAN GRATE INLET FILTER DETAILS		MEETS FULL CAPTURE REQUIREMENTS		<p>Bio Clean A Forterra Company</p>
TYPICAL MODEL DETAIL				
WARRANTY: 1 YEAR MANUFACTURER'S		PROJECT:		
BIO CLEAN ENVIRONMENTAL SERVICES, INC. 398 VIA EL CENTRO, OCEANSIDE CA 92058 PHONE: 760-433-7640 FAX: 760-433-3176		REVISIONS:	DATE:	
		REVISIONS:	DATE:	
DATE: 10/12/17	SCALE: SF = 15	REVISIONS:	DATE:	
DRAFTER: M.C.P.	UNITS = INCHES	REVISIONS:	DATE:	

Appendix C – Geotechnical Report and Percolation Test