

# North 43 Lagoon

## General Information

### Background

As part of the North 43 Lagoon wastewater collection and transmission system, the Summer Village of Ross Haven has a septic tank effluent pumping (STEP) low-pressure force main system. The system allows wastewater flows from each homeowner's residence to the North 43 Lagoon facility.

The Summer Village of Ross Haven portion of this project was completed in January 2023.

### North 43 Lagoon System

The collections and transmission system are owned and operated by the North 43 Lagoon Commission. It utilizes road rights-of-way along the main streets within the Summer Village. Each street is connected to the transmission main by a collection line with individual 38 mm service stubs extending into the property line of each lot. A curb stop (cc) valve has been installed on each service stub and will form the custody transfer point between the commission and homeowner.

The system services all homeowners in the Summer Village. Individual lot connections are the homeowner's responsibility.

Commission operations staff will be responsible to confirm all connections are adequately constructed and permitted before allowing flows from individual lots. This will help prevent complications in overall system operation and help protect your lot. Should issues arise, the Commission will maintain available staff and a 24-hour emergency number to correct problems.

### Homeowner System

Each homeowner is responsible for their own private system which will convey wastewater to the custody transfer point and into the commission line. For your property in the Summer Village, this will include procurement of equipment to establish the connection as well as taking on responsibility for any future maintenance.

The homeowner system has three mandatory components for connection:

#### 1. Septic / Holding Tank

Only screened effluent from individual septic tank(s) are allowed to be pumped into the sanitary collection system. Septic / holding tank(s) must have solid-liquid separation mechanism to ensure only clarified effluent will be pumped. It is your responsibility to confirm the state of your tank and determine the solution based on the three observed scenarios below:

If the Homeowner **has an existing dual chamber septic / holding tank** they will be responsible to procure an approved pump package. This will either be installed into the clarified tank chamber (second stage chamber) or make a separate connection to an external pump chamber. Either configuration is feasible so the homeowner may proceed with whichever is deemed easier due to accessibility, above ground features, or other restraints. The recommended pump unit remains the same in either case. Details on the dual chamber tank configuration are included for reference.

If the Homeowner **has a single chamber septic / holding tank**, they will be responsible to procure an approved pump package. This is recommended to be installed in an external pump chamber but may in some cases be installed in the septic tank. However, for the homeowner to install the pump package directly into a single chamber tank, they will need to confirm the applicability with the



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supplier which involves confirming tank type, depth, and right in manway access configuration. The homeowner would connect a pipe to their storage tank above the level of grit settlement and connect to the separate prepackaged pumping chamber. The separate pump chamber facilitates grit and solids settlement and can significantly reduce future maintenance. Details on the single chamber tank and separate pump chamber are included for reference.

If the homeowner **does not have an existing septic / holding Tank**, the homeowner will be responsible to procure a tank and pumping system. A minimum 1500 gallon dual chamber tank is required for new installations to allow solid-liquid separation. This will also provide some storage capacity in the event of pump failure (i.e. power failure). Details on the septic / holding tank compatible with the specified pump are included for reference.

### 2. Effluent Pump

The North 43 Lagoon Commission recommends that an Orenco ProPak pump package unit with PF 10051 60 Hz Series ½ HP submersible effluent pump is used. However, an alternative pre-approved pump package may be used if requested. Pump specifications are provided in this package.

Only a CSA certified effluent pump meeting the following criteria will be approved as an alternative for connecting to the sanitary system:

- Type of Pump: Submersible Effluent Pump (Biotube ProPak pump package comes with control panel, level floats, and filter)
- Design Flow Rate: 0.6 liters per second (10 gallons per minute)
- Total Dynamic Head: 54 m (175ft) at 0.6 l/s design flow rate.
- Power and Voltage: 0.5 HP, 120v/240 v, Single Phase
- Pump package height dependent on tank depth
- External Splice box
- Cold Weather Discharge Assembly
- Drainback Discharge Assembly
- Demand Dosing Control Panel
- Pipe Pressure (38 mm) to the service stub must be rated for a working pressure of 100 psi
- Water depth monitoring mechanism is required for automatic pump operation or warning.

### 3. Service Connection

The service connection itself will be defined as the piping connection between the homeowner tank / effluent pump / backflow configuration and the commission service stub and cc valve. The commission will require the depth of bury of the pump outlet to be 2.7 m unless it is insulated or heat traced. It is recommended to bury piping below the frost line whenever possible but is ultimately the homeowners responsibility to mitigate frost concerns at their pump.



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### Other Recommendations

The following are additional items to consider for convenient operation of your system.

- The tank and pump can clog just like a municipal sewer system. Only water-based liquids, human waste, and toilet paper should be sent down the drain. Do not cloth, paint, chemicals, flushable wipes, sanitary napkins, diapers, or any other solids down the drain.
- Add coverage for the tank and pump to your home insurance policy.
- Maintain an accurate record of equipment and installations.
- Inquire on the warranty of your new equipment.
- Install the pump control panel in an easily accessible location.
- Read the owner's manual and ask questions of the vendor to fully understand your equipment.
- Complete the maintenance and service checks recommended in the owner's manual.

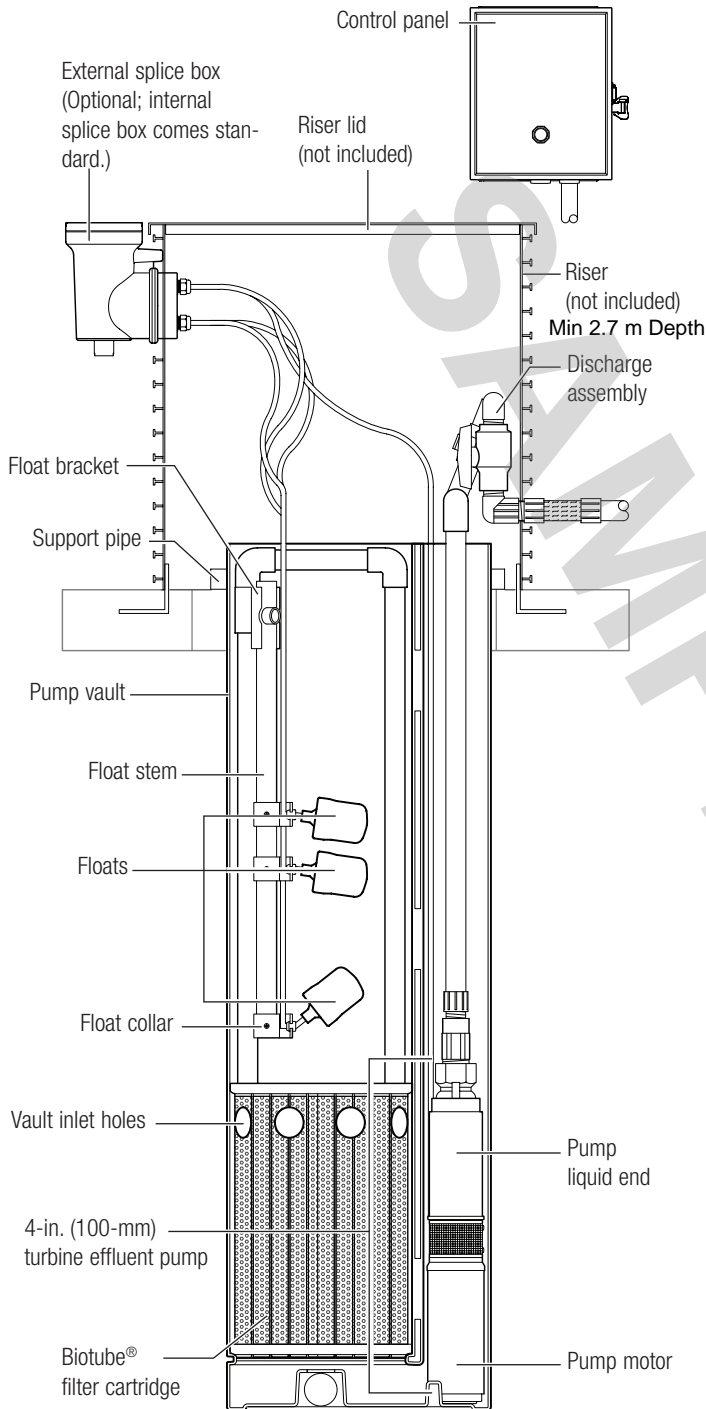


## **APPENDIX A**

Orenco ProPak Pump Package – PF 10051 60 Hz ½ HP Effluent Pump

# Biotube® ProPak™ Pump Package

## 60-Hz Series Pump Packages



*Biotube® ProPak™ pump package components.*

## Applications

The Biotube ProPak is designed to filter and pump effluent to either gravity or pressurized discharge points. It is intended for use in a septic tank (one- or two-compartment) and can also be used in a pump tank.

The Biotube ProPak is designed to allow the effluent filter to be removed for cleaning without the need to remove the pump vault or pump, simplifying servicing.

Complete packages are available for on-demand or timed dosing systems with flow rates of 10, 20, 30, and 50-gpm\* (0.6, 1.3, 1.9, and 3.2 L/sec), as well as with 50 Hz and 60 Hz power supplies.

## General

Orenco's Biotube® ProPak™ is a complete, integrated pump package for filtering and pumping effluent from septic tanks. And its patented pump vault technology eliminates the need for separate dosing tanks.

This document provides detailed information on the ProPak pump vault and filter, 4-in. (100-mm) 60-Hz turbine effluent pump, and control panel. For more information on other ProPak components, see the following Orenco technical documents:

- Float Switch Assemblies (NTD-MF-MF-1)
- Discharge Assemblies (NTD-HV-HV-1)
- Splice Boxes (NTD-SB-SB-1)
- External Splice Box (NTD-SB-SB-1)

## Standard Models

BPP10DD, BPP20DD, BPP20DD-SX, BPP30TDA, BPP30TDD-SX, BBPP50TDA, BPP50TDD-SX

## Product Code Diagram

BPP [ ] [ ] - [ ]

Standard options:

Blank = 57-in. (1448-mm) vault height, internal splice box, standard discharge assembly  
68 = 68-in. (1727-mm) vault height

SX = external splice box  
CW = cold weather discharge assembly  
DB = drainback discharge assembly

Panel Application:

DD = demand dosing  
TDA = timed dosing, analog timer  
TDD = timed dosing, digital timer, elapsed time meter & counters

Pump flow rate (nominal):

10 = 10 gpm (0.6 L/sec)  
20 = 20 gpm (1.3 L/sec)  
30 = 30 gpm (1.9 L/sec)  
50 = 50 gpm (3.2 L/sec)

Biotube® ProPak™ pump vault

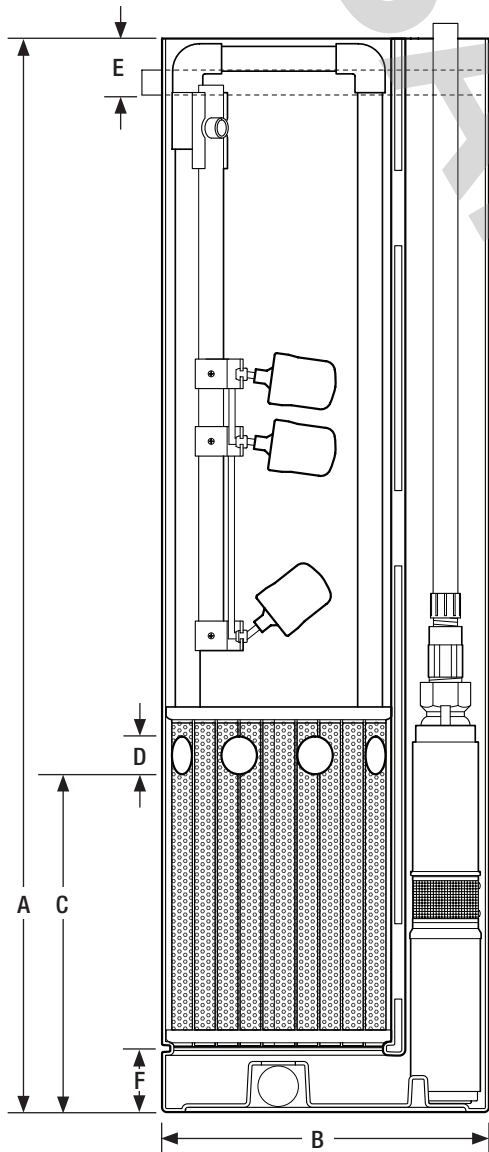
## ProPak™ Pump Vault

### Materials of Construction

Vault body	Polyethylene
Support pipes	PVC

### Dimensions, in. (mm)

A - Overall vault height	57 (1448) or 68 (1727)
B - Vault diameter	17.3 (439)
C - Inlet hole height	19 (475)
D - Inlet hole diameter (eight holes total)	2 (50)
E - Vault top to support pipe bracket base	3 (76)
F - Vault bottom to filter cartridge base	4 (102)



ProPak™ pump vault (shown with Biotube filter and effluent pump)

## Biotube® Filter Cartridge

### Materials of Construction

Filter tubes	Polyethylene
Cartridge end plates	Polyurethane
Handle assembly	PVC

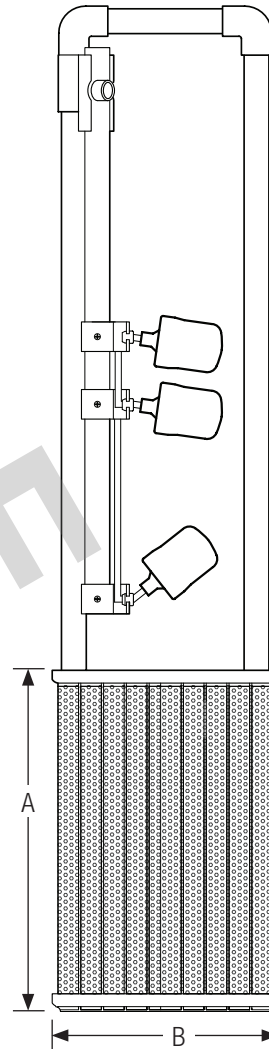
### Dimensions, in. (mm)

A - Cartridge height	18 (457)
B - Cartridge width	12 (305)

### Performance

Biotube® mesh opening	0.125 in. (3 mm)*
Total filter flow area	4.4 ft <sup>2</sup> (0.4 m <sup>2</sup> )
Total filter surface area	14.5 ft <sup>2</sup> (1.35 m <sup>2</sup> )
Maximum flow rate	140 gpm (8.8 L/sec)

\*0.062-in. (1.6-mm) filter mesh available



Biotube® filter cartridge (shown with float switch assembly)

## 4-in. (100-mm) Turbine Effluent Pumps\*

Orenco's 4-in. (100 mm) Turbine Effluent Pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics; all are field-serviceable and repairable with common tools. All 60-Hz PF Series models are CSA certified to the U.S. and Canadian safety standards for effluent pumps, and meet UL requirements.

Power cords for Orenco's 4-in. (100-mm) turbine effluent pumps are Type SOOW 600-V motor cable (suitable for Class 1, Division 1 and 2 applications).

### Materials of Construction

Discharge:	Stainless steel or glass-filled polypropylene
Discharge bearing:	Engineered thermoplastic (PEEK)
Diffusers:	Glass-filled PPO
Impellers:	Acetal (20-, 30-gpm), Noryl (50-gpm)
Intake screens:	Polypropylene
Suction connection:	Stainless steel
Drive shaft:	300 series stainless steel
Coupling:	Sintered 300 series stainless steel
Shell:	300 series stainless steel
Lubricant:	Deionized water and propylene glycol

### Specifications

Nom. flow, gpm (L/sec)	Length in. (mm)	Weight lb (kg)	Discharge in., nominal <sup>1</sup>	Impellers
10 (0.6)	23.0 (660)	26 (11)	1.25	6
20 (1.3)	22.5 (572)	26 (11)	1.25	4
30 (1.9)	21.3 (541)	25 (11)	1.25	3
50 (3.2)	20.3 (516)	27 (12)	2.00	2

### Performance

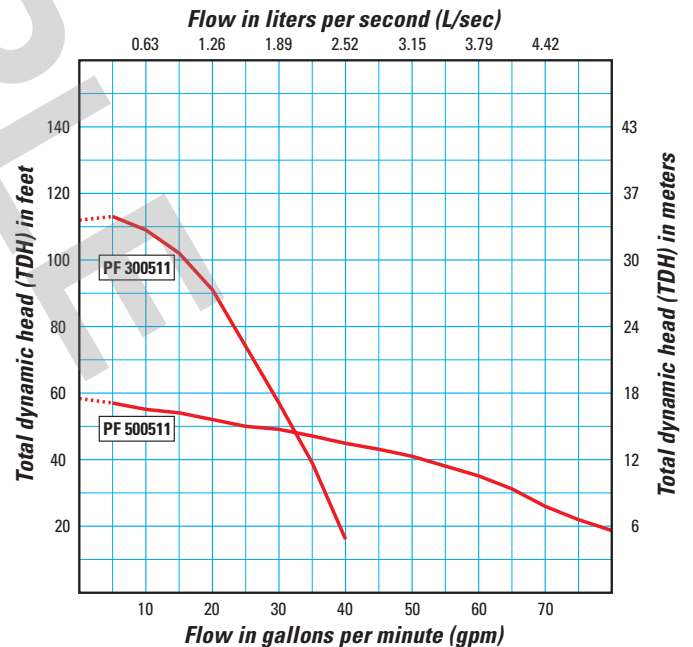
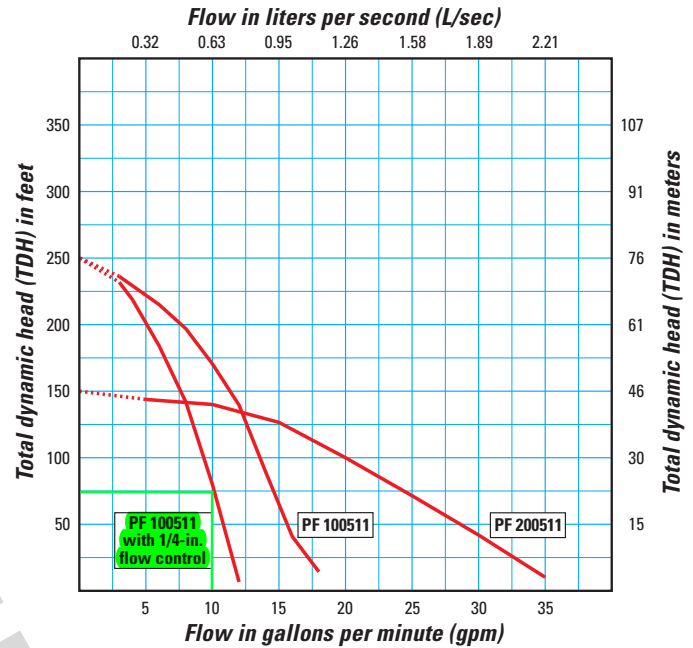
Nom. flow, gpm (L/sec)	hp (kW)	Design flow amps	Rated cycles/day	Min liquid level, in. (mm) <sup>2</sup>
10 (0.6)	0.5 (0.37)	12.7	300	16 (406)
20 (1.3)	0.5 (0.37)	12.3	300	18 (457)
30 (1.9)	0.5 (0.37)	11.8	300	20 (508)
50 (3.2)	0.5 (0.37)	12.1	300	24 (610)

<sup>1</sup> Discharge is female NPT threaded, U.S. nominal size, to accommodate Orenco® discharge hose and valve assemblies. Consult your Orenco Distributor about fittings to connect discharge assemblies to metric-sized piping.

<sup>2</sup> Minimum liquid level is for single pumps when installed in an Orenco Biotube® ProPak™ Pump Vault.

## Pump Curves

Pump curves, such as those shown here, can help you determine the best pump for your system. Pump curves show the relationship between flow (gpm or L/sec) and pressure (TDH), providing a graphical representation of a pump's performance range. Pumps perform best at their nominal flow rate, measured in gpm or L/sec.



## Control Panel (Demand Dose)

Orenco's ProPak™ demand dose control panels are specifically engineered for the ProPak pump package and are ideal for applications such as demand dosing from a septic tank into a conventional gravity drainfield.

### Materials of Construction

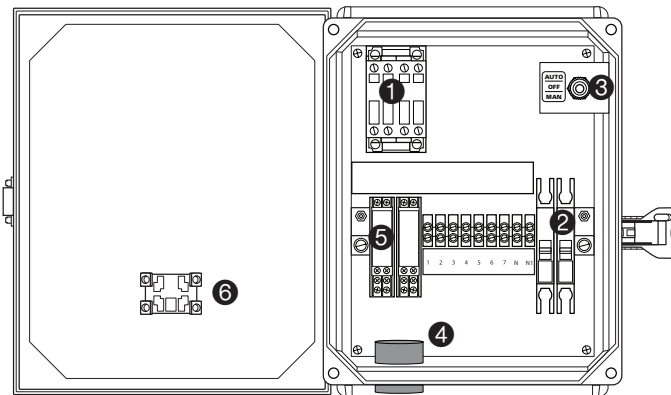
Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

### Dimensions, in. (mm)

A - Height	11.5 (290)
B - Width	9.5 (240)
C - Depth	5.4 (135)

### Specifications

Panel ratings	120 V, 3/4 hp (0.56 kW), 14 A, single phase, 60 Hz
1. Motor-start contactor	16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
2. Circuit breakers	120 V, 10 A, OFF/ON switch, Single pole
3. Toggle switch	Single-pole, double-throw HOA switch, 20 A
4. Audio alarm	95 dB at 24 in. (600 mm), warble-tone sound, UL Type 4X
5. Audio alarm silence relay	120 V, automatic reset, DIN rail mount
6. Visual alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence," 120 V LED, UL Type 4X



*Control panel, demand-dose*

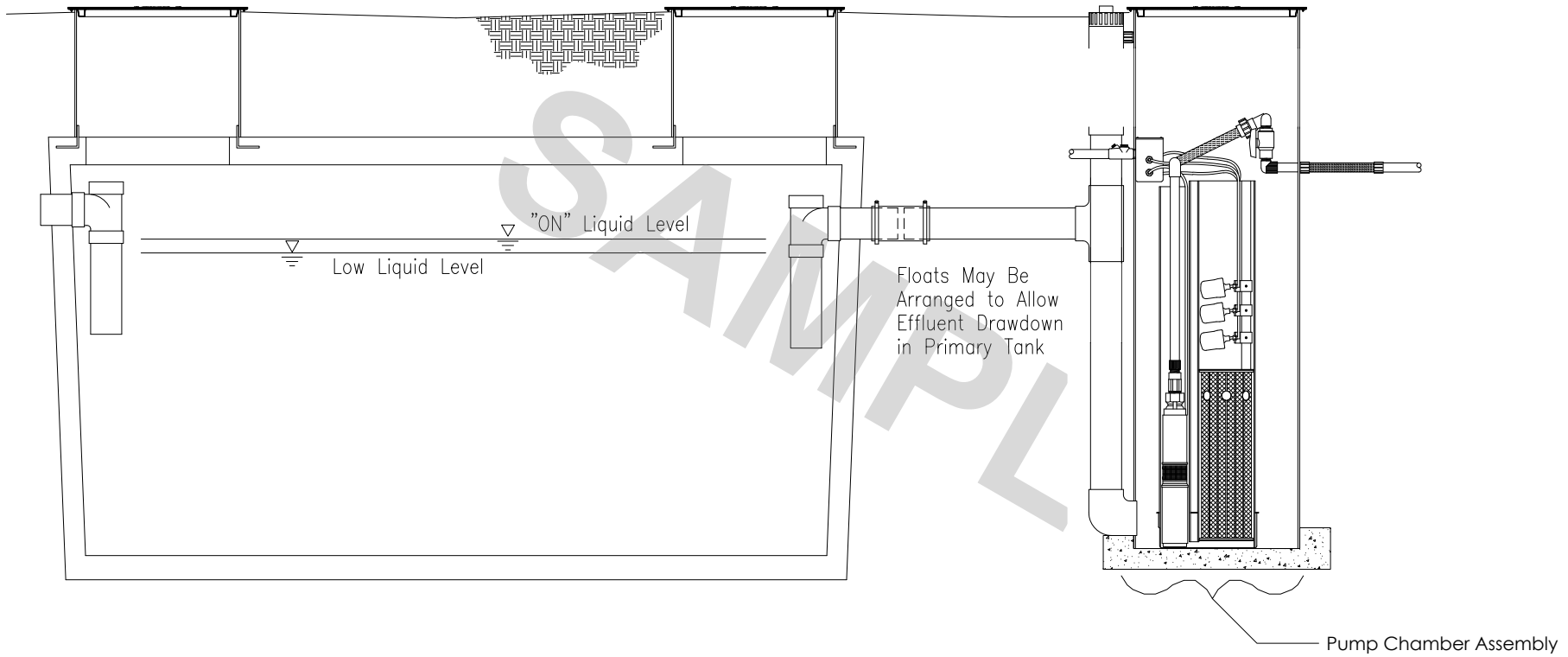


## **APPENDIX B**

### Single Chamber Tank Configurations

# Basin with Effluent Pumping System

Scale: 1" = 2'



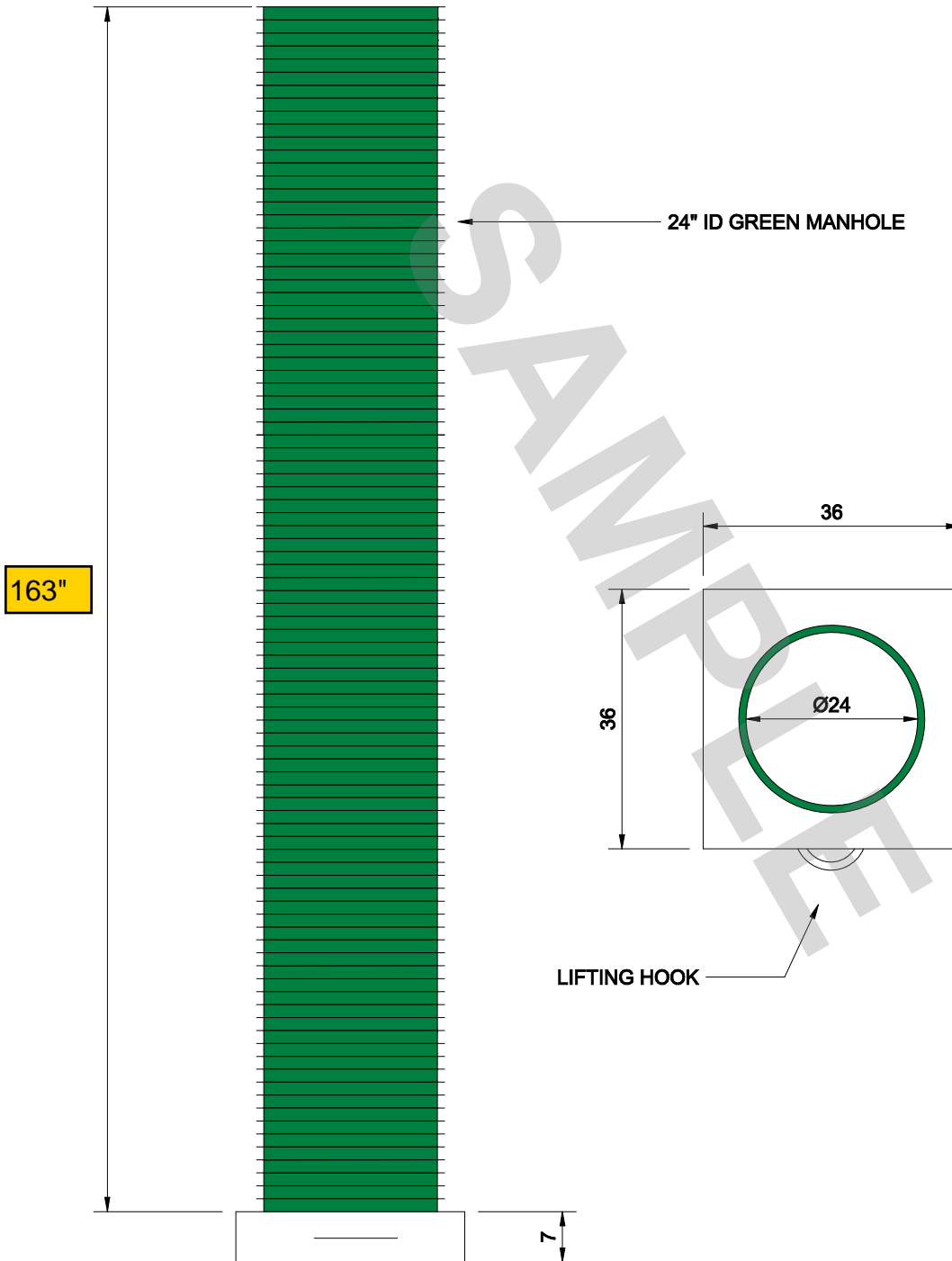
# 14', 24" Pump Chamber

ALL MEASUREMENTS ARE IN INCHES

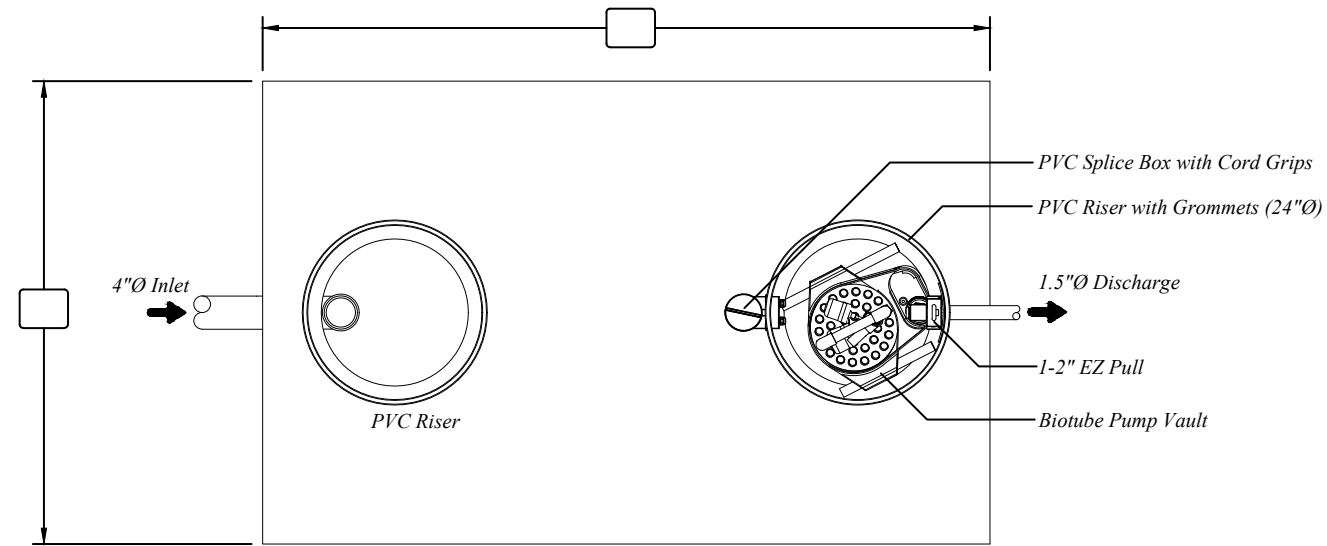
SCALE: 1/2" = 1'

ALBERTA  
WILBERT  
SALES

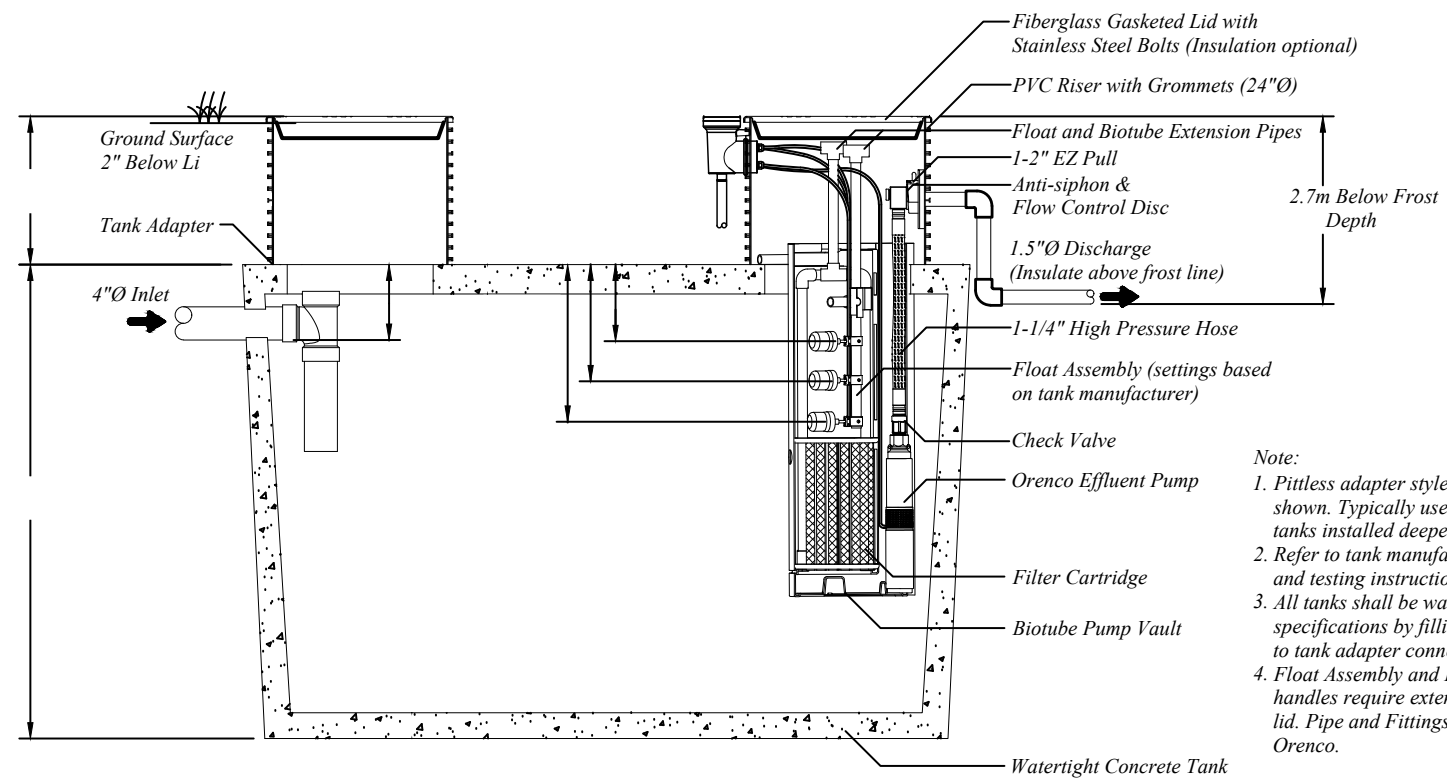
GROUNDING IN EXCELLENCE



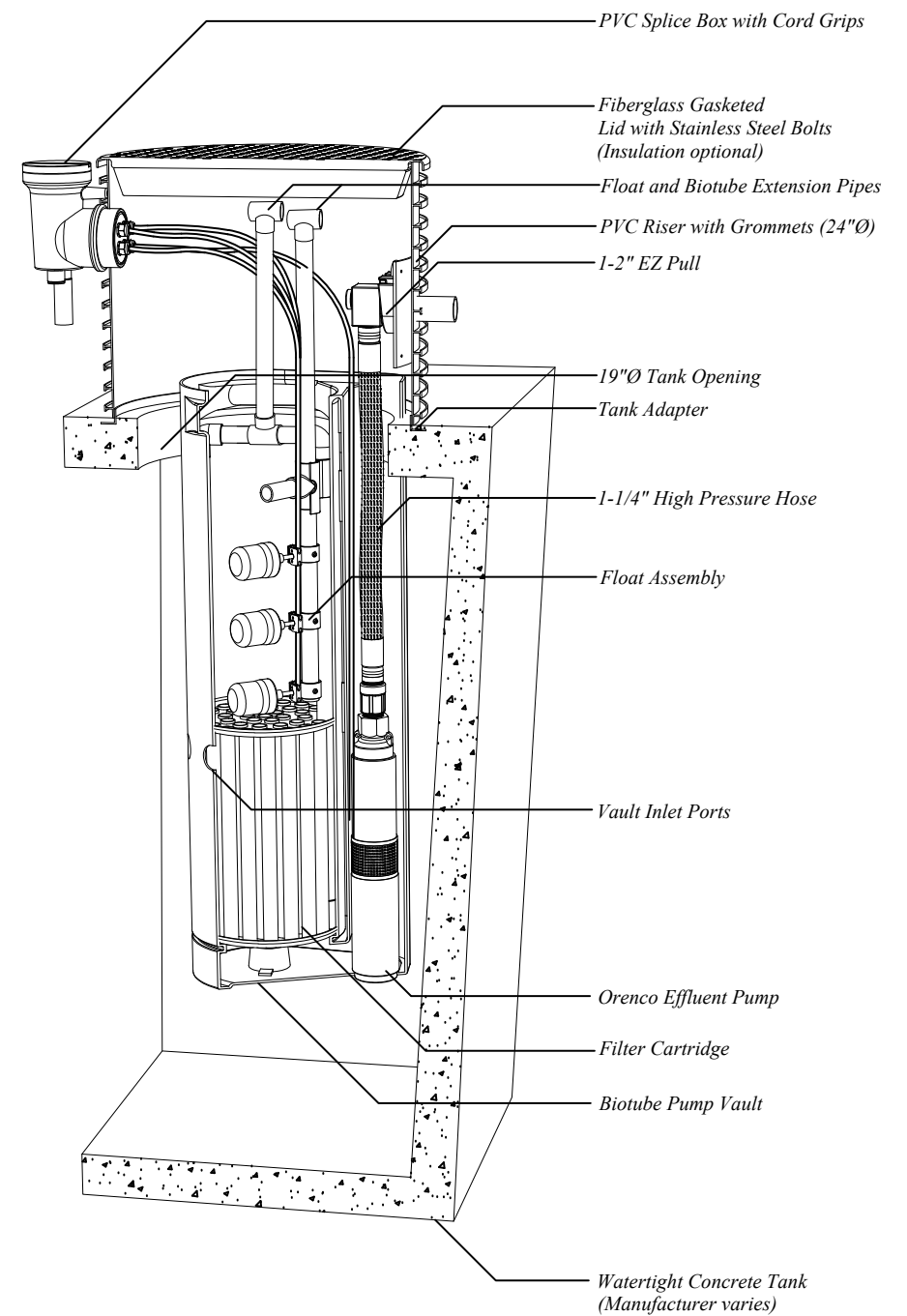
DATE: May 7 2010 16910 129 AVENUE  
PHONE: 780-447-2222 EDMONTON, AB  
FAX: 780-447-1984 T5V 1L1



**TOP VIEW**



**SECTION VIEW**



**ISO DETAIL**

- Note:
1. Pittless adapter style hose and valve shown. Typically used for cold weather or tanks installed deeper than 24".
  2. Refer to tank manufacturer for installation and testing instructions.
  3. All tanks shall be watertight tested per specifications by filling water 2" past riser to tank adapter connection.
  4. Float Assembly and Biotube Cartridge handles require extension to underside of lid. Pipe and Fittings not supplied by Orenco.

\*Homeowner responsible to confirm applicability direct pump insert into single chamber tank with pump supplier



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Portions or all of this Standard System Configuration Drawing, as appropriate, may be reproduced and integrated into the site-specific layout and configuration of a system by its designer.

Disclaimer: This Standard System Configuration Drawing is provided solely as a design aid, and in no event should it be used as a replacement for site-specific engineering and design of the layout and configuration of an actual system. Orenco neither represents nor warrants that the configuration illustrated herein will perform in compliance with the requirements for any particular site.

System:	STEP Package Detail (Concrete Tank)		Drawn By:	DSM	Scale:	1" = 2'-0"	
	Description:	Details		Reviewed By:	GL	Sheet:	1 OF 1
		File Name:	STEP DTL 5.DWG	Rev:	1.2	Date:	09/23/15

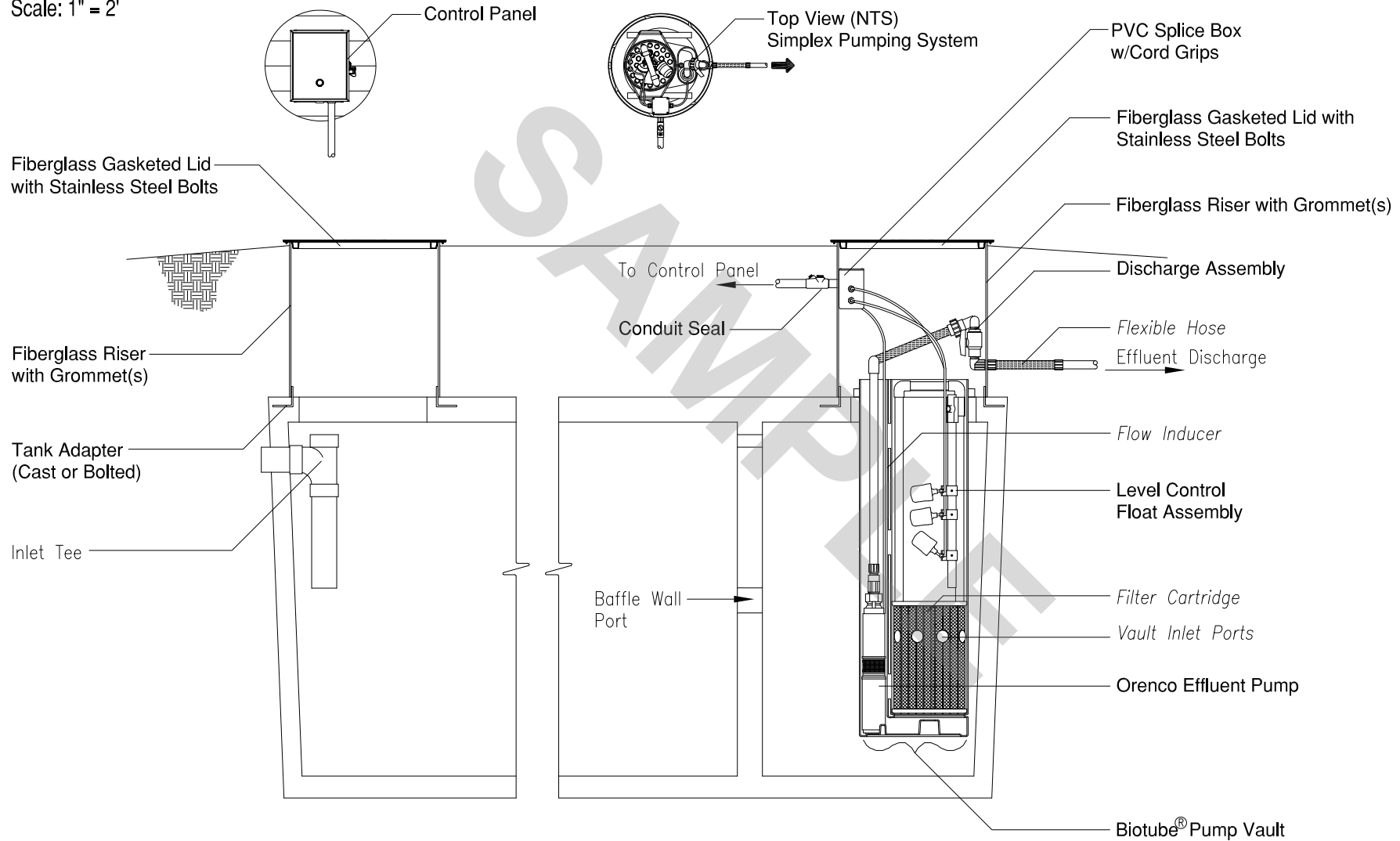
## **APPENDIX C**

Dual Chamber Tank Configuration (Pump Insert)

# Effluent Pumping System - Dual Compartment Drawdown



Scale: 1" = 2'



## **APPENDIX D**

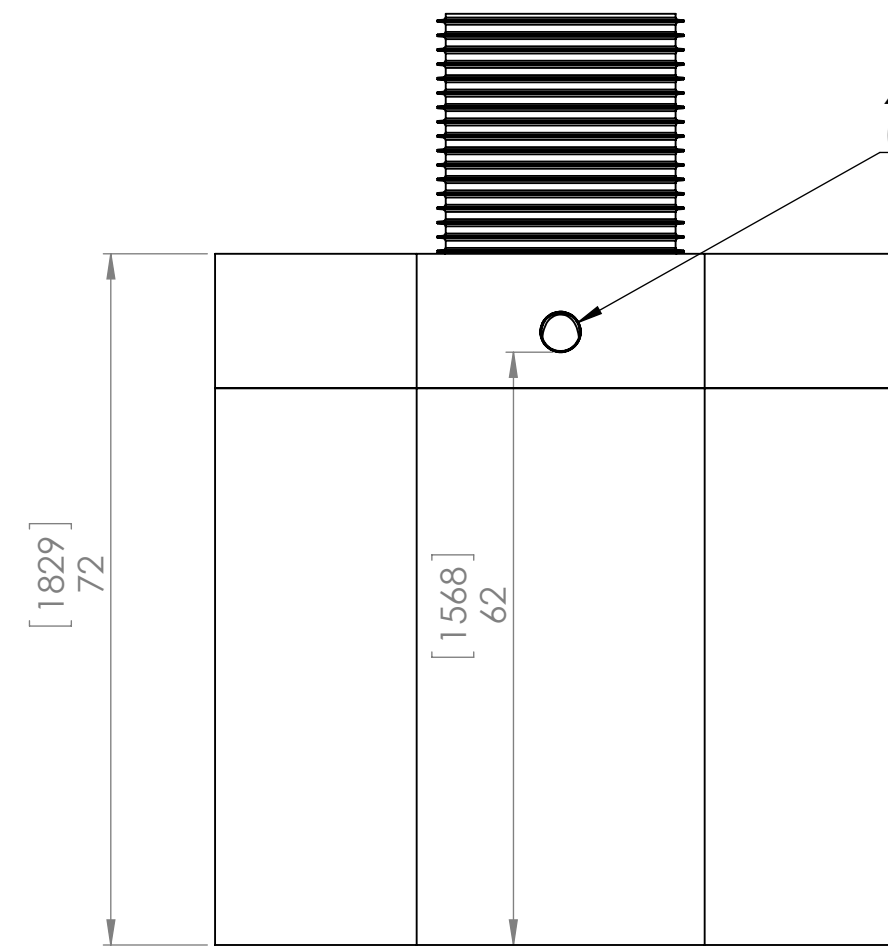
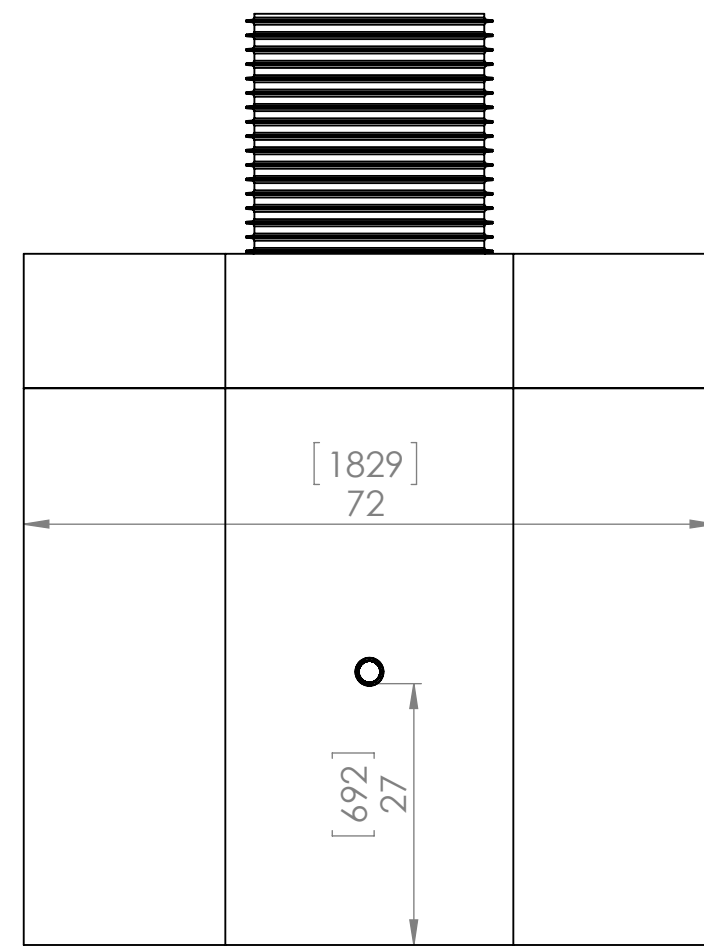
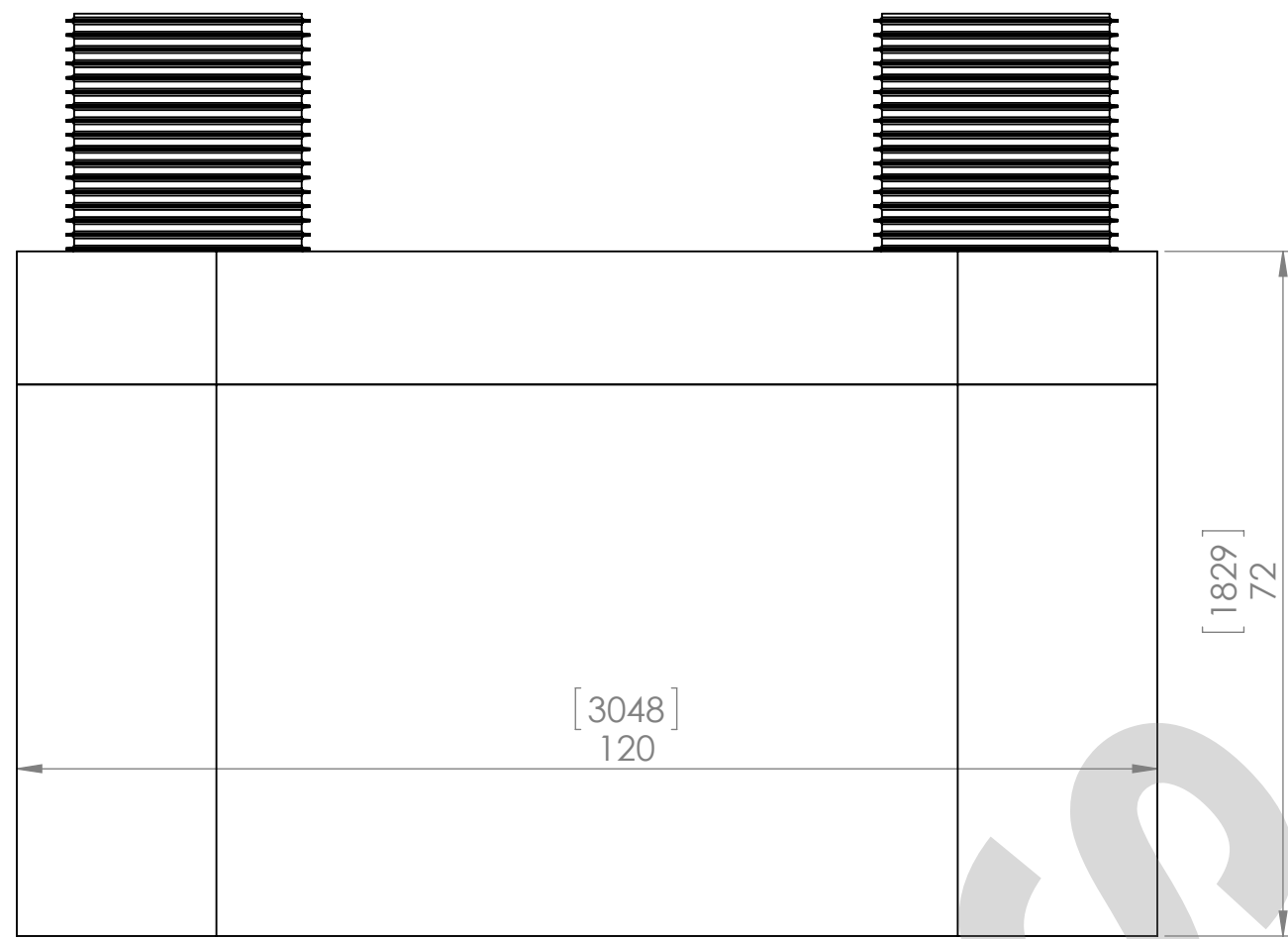
Dual Chamber Septic Tank Reference (for Pump Insert)

4

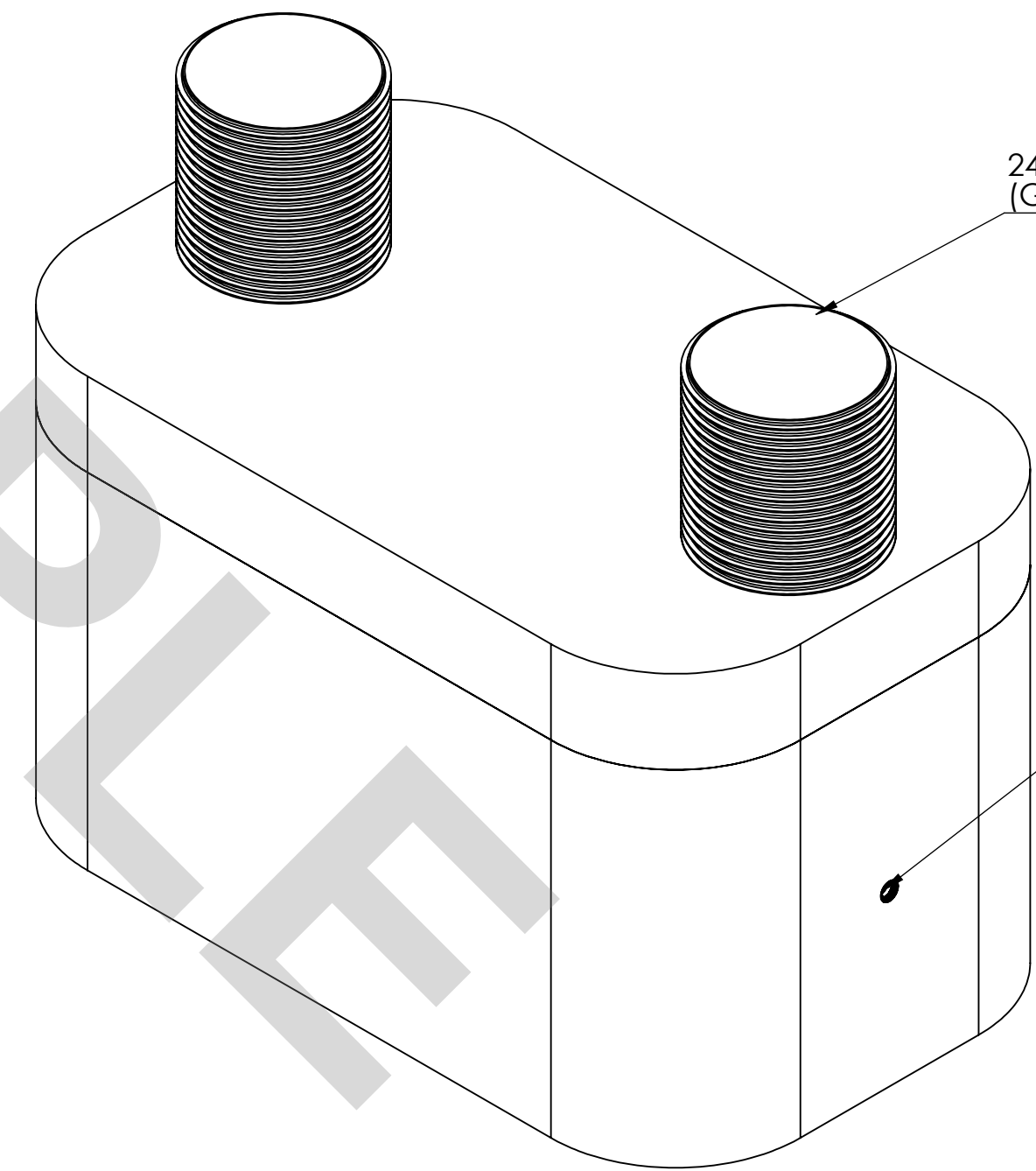
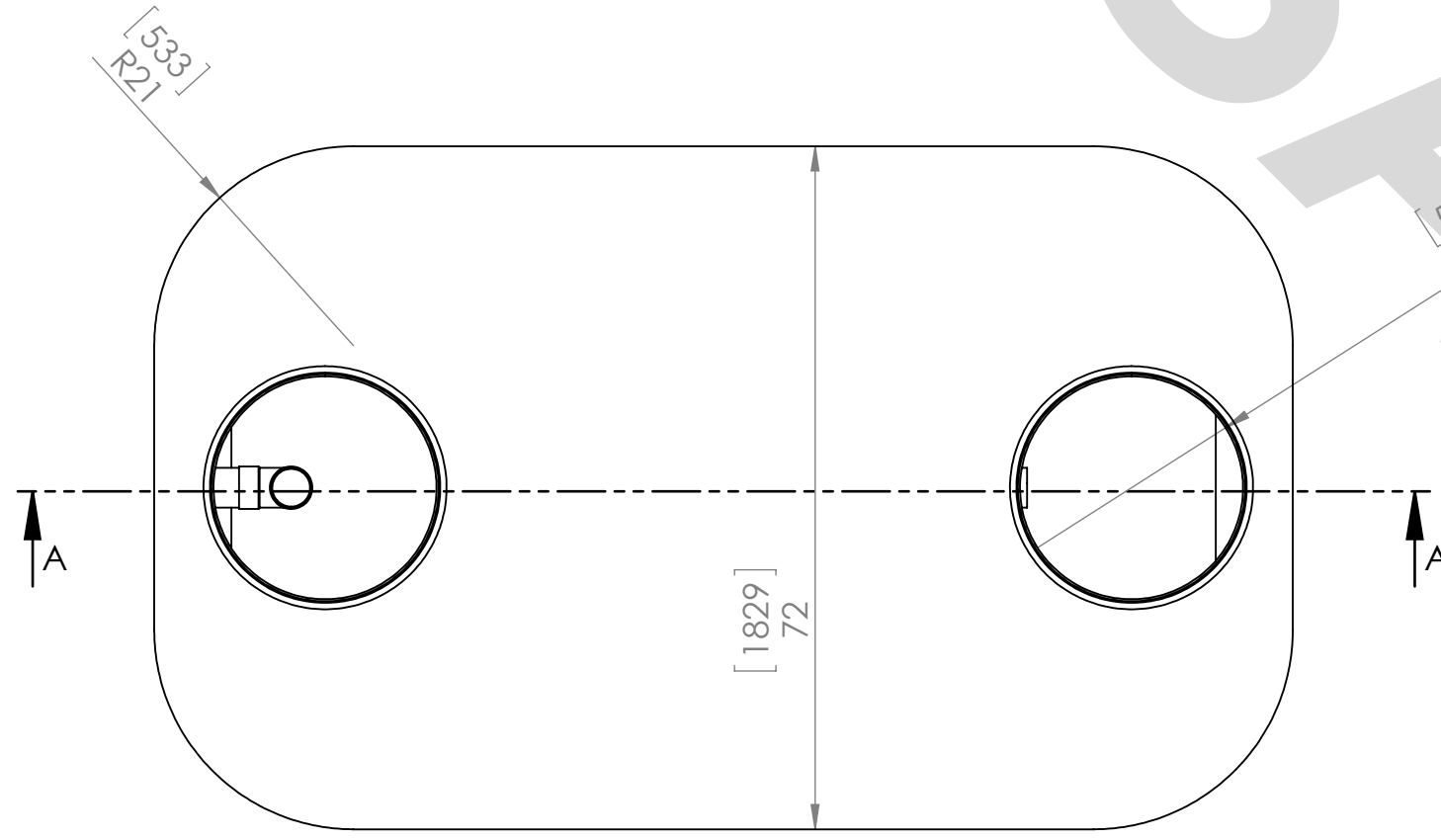
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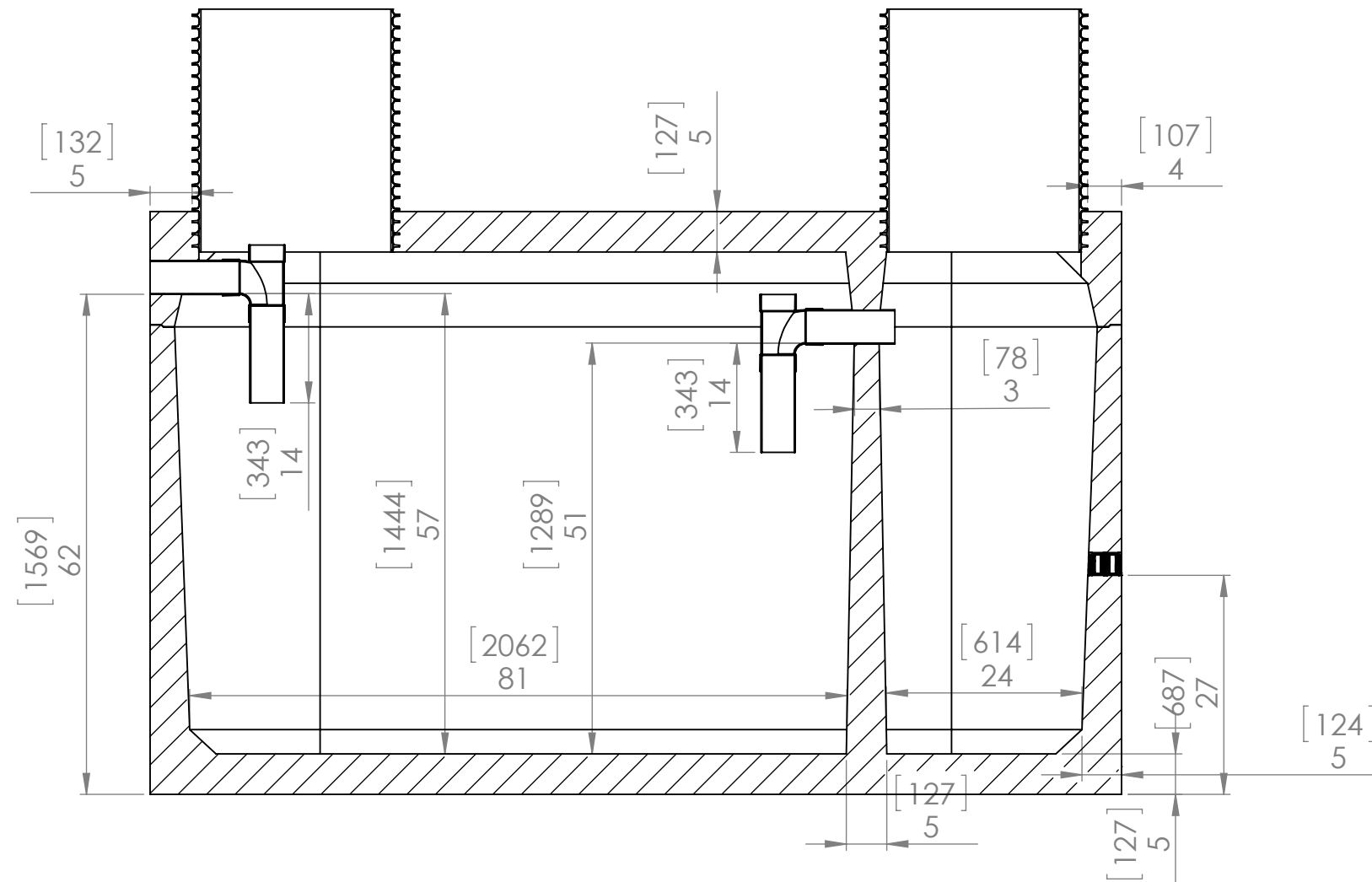


4" Press Seal Gasket (Rubber Boot)



24" Ultra Rib PVC (GMH)

2" Brass Coupling



SECTION A-A



Edmonton  
16910 129 Ave  
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Penhold  
930 Fleming Ave  
PH: 403-886-4852  
Fax: 403-886-4853

Calgary  
4315 58 Ave SE  
PH: 403-230-1666  
Fax: 403-276-4176

### 1500 Gallon Rinktop 2 Compartment GMH

Working Capacity: 950 Imperial Gallons (4318 Litres)  
Pump Chamber: 350 Imperial Gallons (1591 Litres)  
Siphon Flush: 135 Imperial Gallons (614 Litres)  
Dosing Volume: 6.3 Imperial Gal/inch  
Liquid Level Depth: 51 Inches (1289 mm)

Weight: 13600 LBS / 6169 KG  
Material: Concrete Type HS  
Reinforcing: 5mm Rebar & 4x4 (10 Gauge) Wire Mesh  
CSA Approved: 5 Meters  
Model: 1P1500  
Item ID: 11016AG

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SCALE: 1:20

4

3

2

1

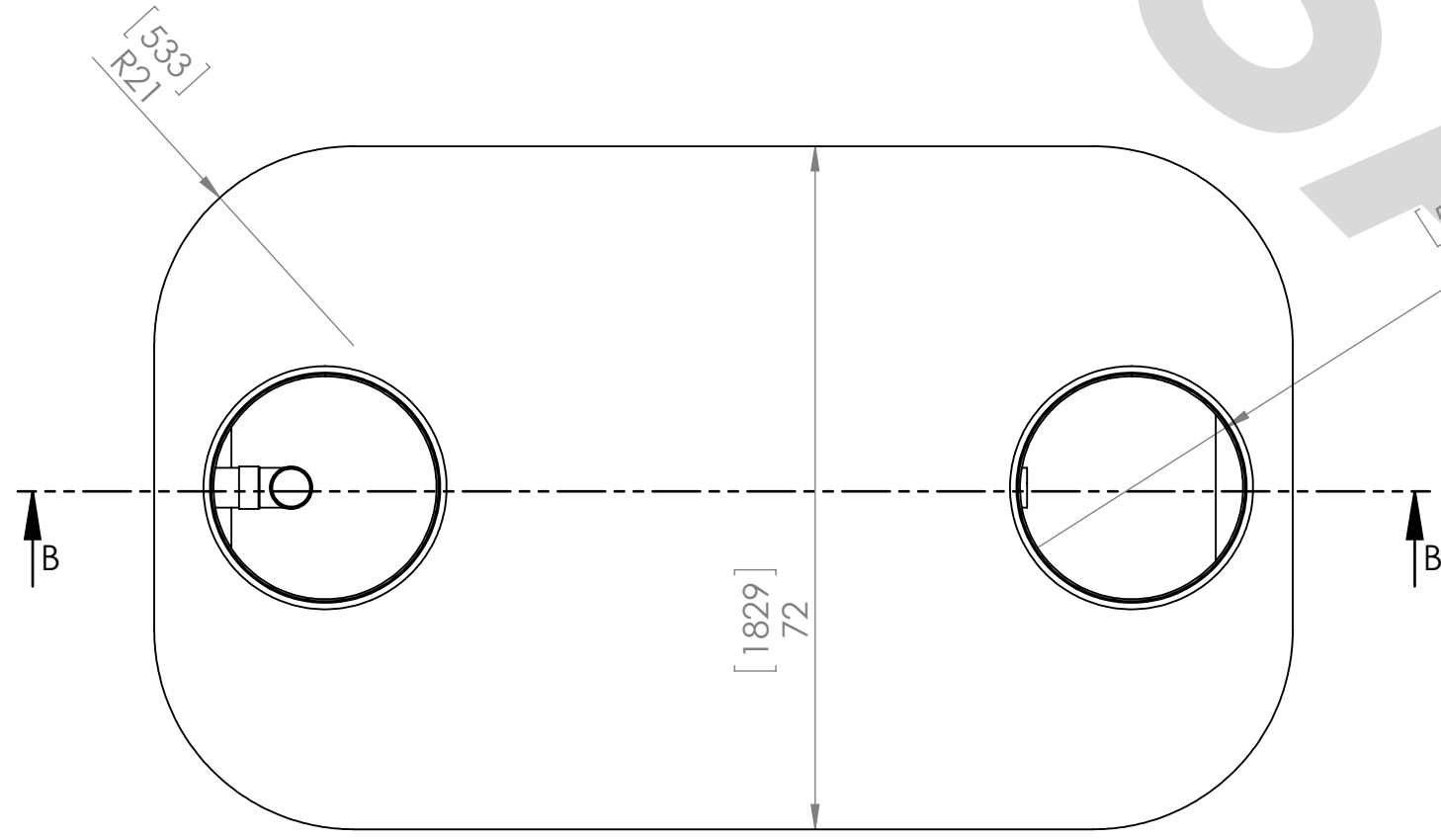
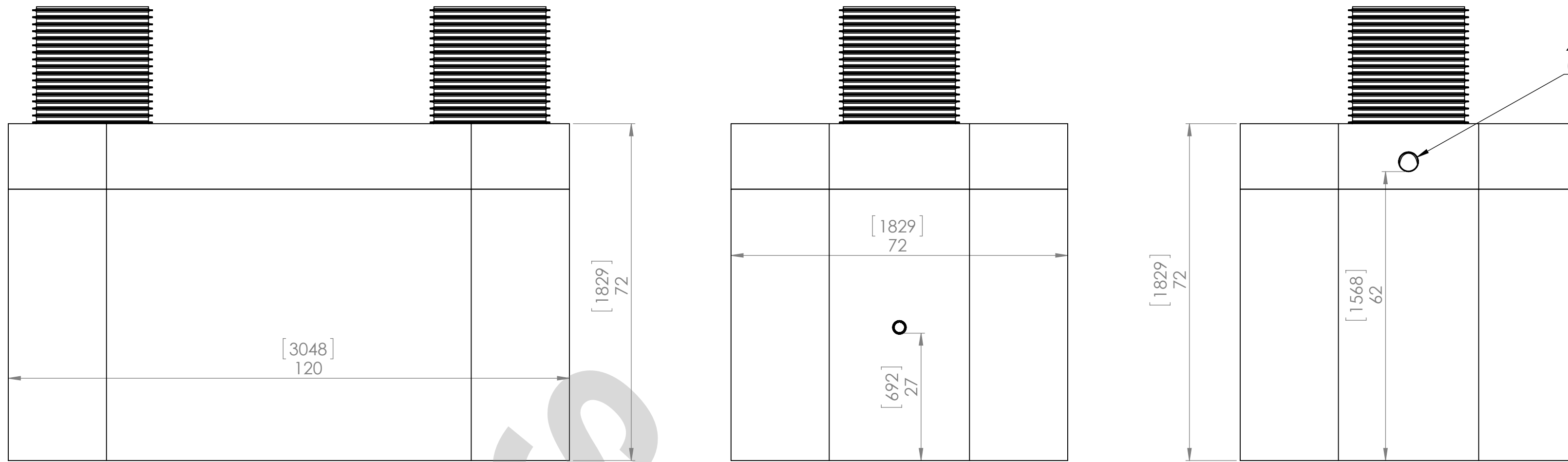


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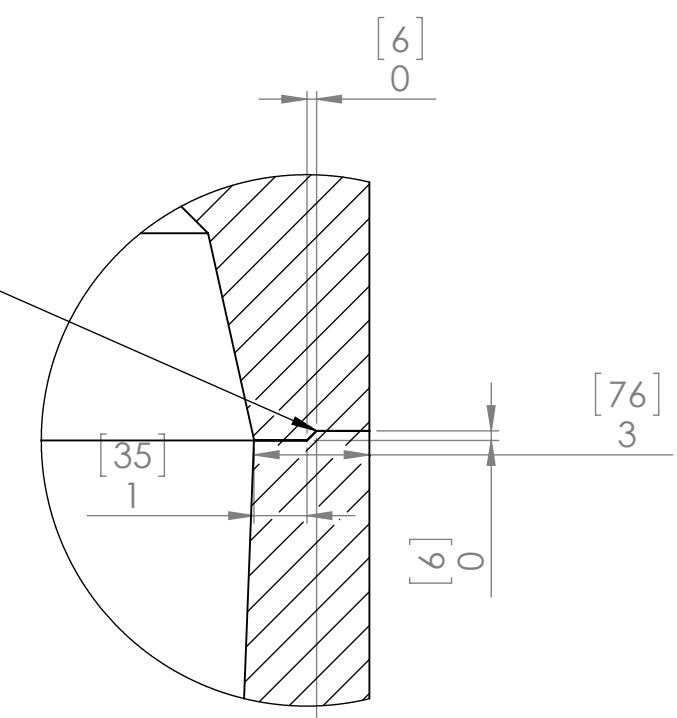
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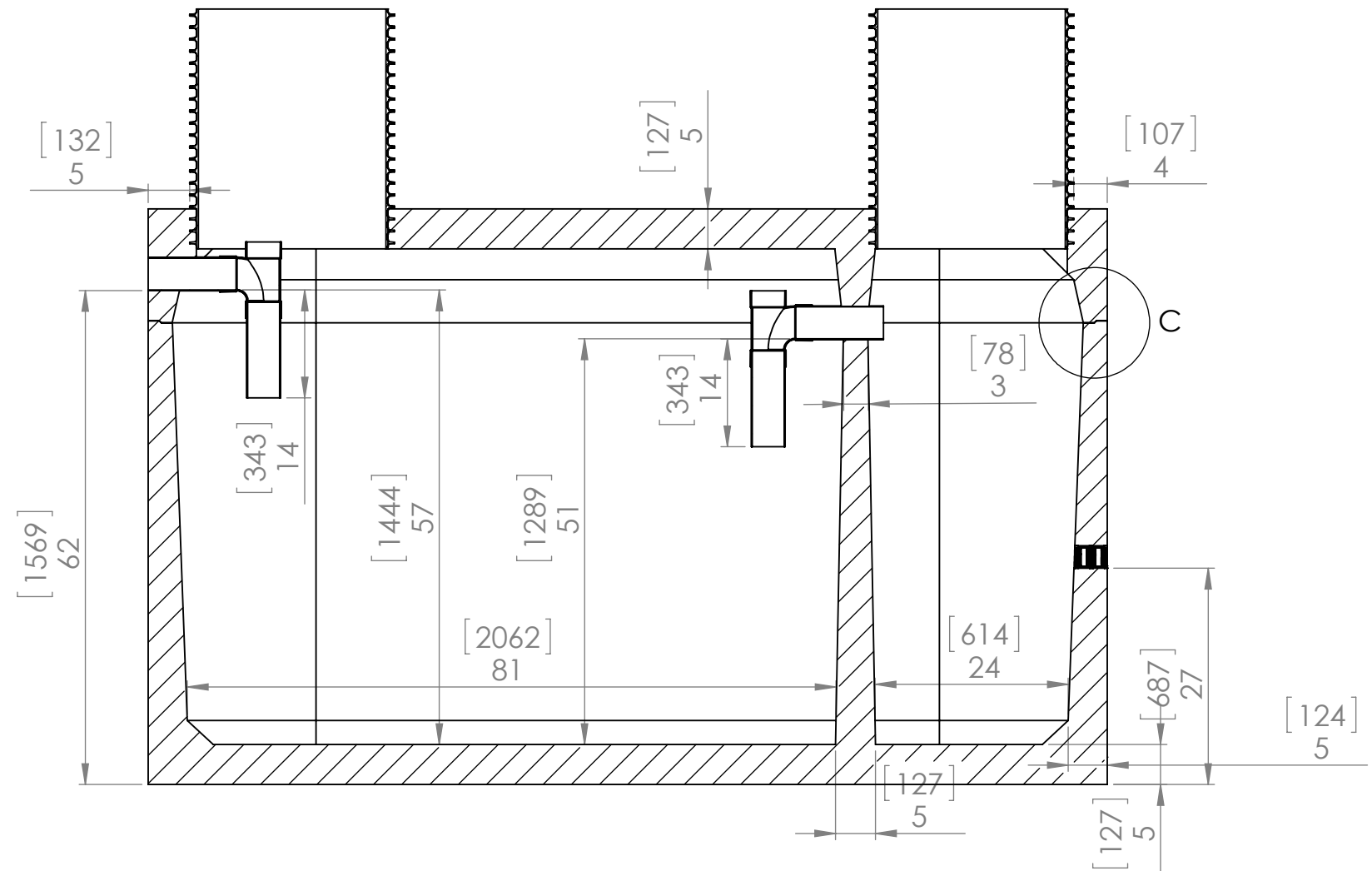
1



1/2" x 1 1/2" Butyl Tape Seal



DETAIL C  
SCALE 1 : 5



SECTION B-B



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