Ecoflo® Biofilter ST/STB Model Series

Design Guide – Delaware

*This guide contains specific information required to plan the installation of an **Ecoflo® Biofilter** in the state of **Delaware.** The installation must be performed by an authorized installer. For more information, contact your local distributor or our customer service at **1 800 632-6356.***

Table of contents:

1 General description of the System

The Ecoflo® Biofilter is a biofiltration system designed to treat domestic septic tank effluent to an extremely high level before final dispersal. A typical Ecoflo® Biofilter system consists of:

- Septic/Primary tank with a commercially-rated effluent filter connected to the tank outlet pipe
- Ecoflo® Biofilter where advanced treatment occurs due to physical, chemical and biological processes that are optimized in the peat-based natural fibrous organic filtering media. The Ecoflo® Biofilter can be housed into different types of tanks (fiberglass, concrete or polyethylene)
- Site specific, final effluent dispersal system.

The Ecoflo® Biofilter system is based on simple, passive biofiltration principles. Once the wastewater has passed through the septic tank, it then flows towards the Ecoflo® Biofilter where a unique combination of physical, chemical and biological interactions between the effluent and the 100% natural peat-based organic filtering media takes place to treat the effluent.

Inside the biofilter, a tipping bucket equally scatters the wastewater on specially designed plates which evenly distribute the wastewater on top of the filtering media. The wastewater then trickles through the 100% natural peat-based organic filtering media, where the wastewater is treated aerobically by bacteria fixed into the filtering media via an optimized water/air (oxygen) mass transfer process (see section 3.6). Treated effluent is then disposed of either by gravity or pumped to final dispersal/infiltration into the ground (see section 3.5).

The Ecoflo® Biofilter has been tested, certified and listed in 2005 by the National Sanitation Foundation International as meeting the requirements of NSF/ANSI Standard 40, Class 1. The Ecoflo® Biofilter ST/STB Model series is certified for a hydraulic loading rate (HLR) applicable to the surface of filtering media of 8.6 US Gal/ft^2 (350 L/m^2-d).

2 Treated Effluent Quality

When treating domestic strength wastewater up to the design flows and loads, a properly maintained Ecoflo® Biofilter system will exceed the performance requirements of NSF Standard 40 Class 1. Actual test results established through analytical methods described in NSF/ANSI Standard 40 averaged 2 mg /L in $CBOD_5$ and 2 mg/L in TSS.

Table 1 - NSF and Ecoflo® Biofilter Influent and Effluent results

PARAMETERS	Influent	Ecoflo® Biofilter	Abatement	NSF Std 40 Avg, 30-day	Delaware Ecoflo Approval
TSS (mg/L)	170 ± 370	2 ± 0.7	99 %	30	10
$CBOD_5$ (mg/L)	140 ± 160	2 ± 0.3	99 %	25	10
Fecal Coliforms (UFC/100 ml)		< 1,000	app. Log 3	N.A.	25,000
pH	7.0	7.0		6-9	w/o
D.O. (mg/L)		5.2 ± 1.4		N.A.	w/o
Temperature (C)	24 ± 4	27 ± 5		N.A.	w/o

The Ecoflo® Biofilter system has demonstrated its robustness over the years. The system does not require any acclimation/start-up period to consistently provide effluent quality demonstrated in Table 1, which makes it the perfect system for secondary or seasonal home applications or any other intermittent use applications. Also, the Ecoflo® Biofilter system has been specifically developed and tested for cold climate applications. Treatment efficiency is not subject to significant variation with ambient air temperature fluctuation.

3 Wastewater System Component Design & Specification

3.1 System Design Responsibilities

The designer of an Ecoflo® Biofilter system will be responsible for proper configuration and sizing of the components of the system, pump and other peripheral component specifications as well as treated effluent dispersal or final disposal and construction details as described in the Ecoflo® Biofilter design guide.

3.2 Design Flow

Delaware regulations usually define the daily flow based on the number of bedrooms with a defined flow per bedroom of 120 US Gal/d.

3.3 Septic Tank

The size and configuration of the septic/primary tank shall be in accordance with the NSF listing (as applicable) or State or local requirements. As per manufacturer's specifications, the septic/primary tank shall have a minimum theoretical holding capacity of 36 hours retention.

To improve the efficiency of any septic installation and extend the life of the treatment system, we recommend using a larger septic tank than that prescribed. Premier Tech Aqua provides a complete line of high-performance polyethylene septic tanks ranging from 600 to 1,530 US gallons. Consult Premier Tech Aqua's Peripherals section at ***ptzone.premiertechaqua.com*** for more information on these products.

3.4 Effluent Filter

The effluent filter helps prolong the life of any treatment system by keeping solids in the septic tank. The effluent filter is particularly important when the household is equipped with a garbage disposal unit, a sewage pump, or any other appliance or device likely to increase the suspended solids content in the wastewater and thereby jeopardize the operation of the system and affect its performance. In situations where an effluent pump is required as part of the septic system, an effluent filter will also prevent solids from reaching said pump. **No garbage disposal unit should be installed on your septic system.**

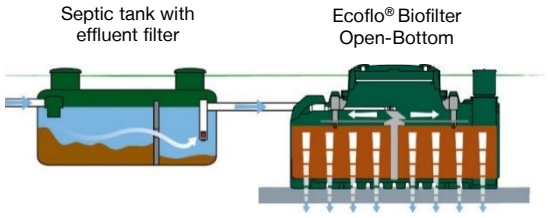
Effluent filters to be used with the Ecoflo® Biofilter shall have a minimal flow area of 90 in² with maximal openings of 0.06" and larger. While many different brands of effluent filters meet those specifications, Premier Tech Aqua highly recommends the use of the effluent filter **PL-122**.

Effluent filters are normally installed in the second compartment of the septic tank however, they may also be installed immediately after the septic in accordance with local regulations. Premier Tech Aqua offers this type of tank, either already equipped with a PL-122 effluent filter (TLF-240P) or without an effluent filter (TLF-240). Please consult Premier Tech Aqua's Peripherals section at ***ptzone.premiertechaqua.com*** for more information on these products.

3.5 Ecoflo® Biofilter

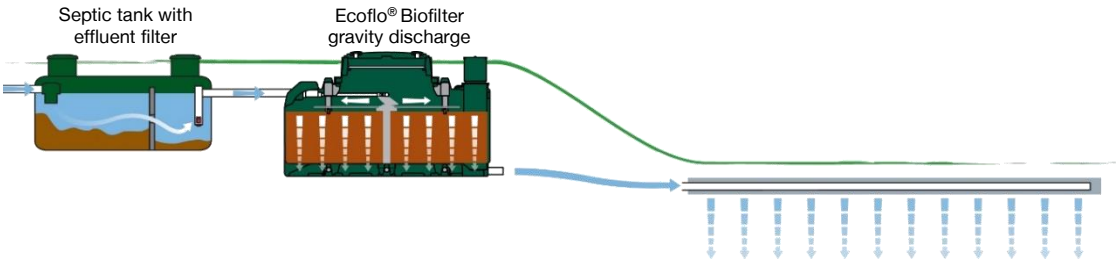
The Ecoflo® Biofilter is a biofiltration system designed to treat the domestic wastewater of a single household. Once the wastewater has passed through the septic tank, it then flows towards the Ecoflo® Biofilter. Inside the biofilter, a central tipping bucket equally scatters the wastewater on both sides of the biofilter. Both sides are equipped with specially designed plates which evenly distribute the wastewater on top of the filtering media. The wastewater then trickles through the natural fibrous filtering media as its organic matter is decomposed by aerobic microorganisms attached to the media. The treated effluent can either be:

- Discharged by infiltration in a soil absorption system located directly underneath the Ecoflo® Polyethylene or Fiberglass units (ST models):



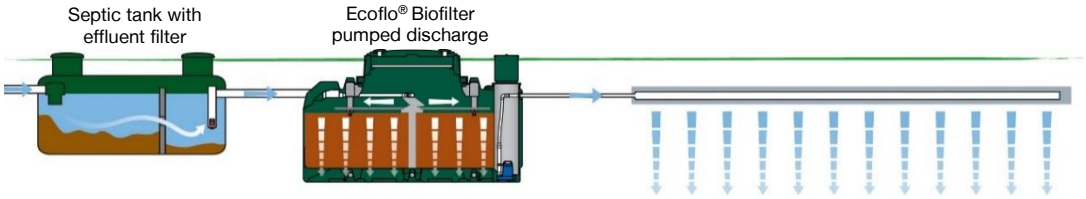
Polyethylene open-bottom model shown

- Collected at the bottom of the shell to be discharged by gravity to a soil absorption system (STB models):



Polyethylene gravity discharge model shown

- Collected at the bottom of the shell and pumped to soil absorption system or disposal method (STB models with integrated pump):



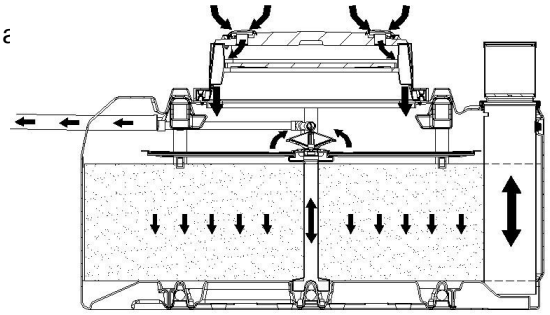
Polyethylene pumped discharge model shown

The biofilter can also be used for commercial, communal, municipal or institutional applications when the wastewater to be treated is comparable to domestic wastewater. Please contact Premier Tech Aqua's customer service for more information on these applications.

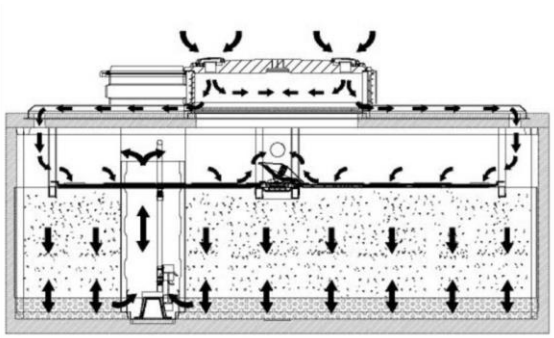
3.5.1 Aeration Principle in the Ecoflo® Biofilter

To perform efficiently, the system requires a sufficient amount of oxygen to feed the microorganisms present in the media. The aeration principle of the system is based on gravity air flow as illustrated on the air flow diagrams below. The air intake is located on the main access lid of the biofilter and an independent vent assures the air flow through the system. Thus, air comes into the system through the lid and is then deflected by a panel that redirects the air to aeration channels. These channels distribute the air throughout the tank. The central support and/or the pumping vault provide a link between the bottom and the top of the filtering media. The air also penetrates into the filtering media through water infiltration. The air coming out of the filtering media is evacuated by passing through the opening located on top of the central support or on the access well. Finally, it is conducted by convection to the house's air vent via the septic tank.

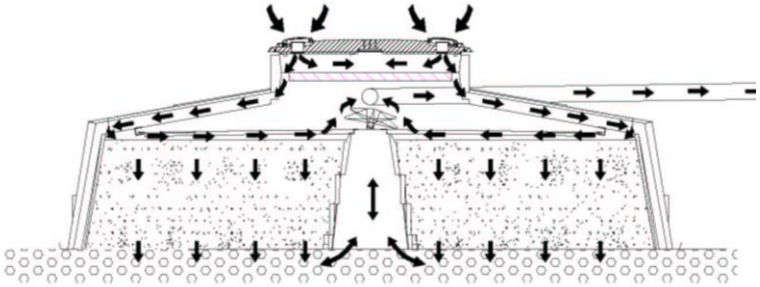
- Polyethylene Ecoflo® Biofilter a



- Concrete Ecoflo® Biofilter air flow diagram:



- Fiberglass Ecoflo® Biofilter air flow diagram:



3.6 Design criteria

Usually, the model and the number of Ecoflo® Biofilters are determined either by the number of bedrooms in a home or by the total domestic wastewater flow per day. The selection of the model also depends (without limitation) on the available surface area, the topography of the lot, as well as the type, permeability and depth of the natural soil on site.

Table 2 summarizes the main design criteria for the Ecoflo® Biofilter.

Table 2 - Ecoflo® Biofilter ST/STB model series design criteria

HLR	8.6 US Gal/ft².d
OLR	0.010 lb $CBOD_5$/ft² (50 g $CBOD_5$/m².d)
Filtering Media height	31 in

There are many different models of Ecoflo® Biofilter and each model has different characteristics. The letters and numbers associated with the Ecoflo® Biofilter specify the model's characteristics, as presented in Table 3 with model **STB-570PR** as reference:

Table 3 - Ecoflo® Biofilter ST/STB models series characteristics

STB refers to the discharge method	ST = Open or perforated bottom (infiltration under the biofilter) **STB** = Watertight bottom (gravity or pumped discharge)
570 refers to the capacity	500 = Nominal filtering media surface of 54 ft² (5.0 m²) **570** = Nominal filtering media surface of 61 ft² (5.7 m²) 650 = Nominal filtering media surface of 70 ft² (6.5 m²) 730 = Nominal filtering media surface of 79 ft² (7.3 m²)
P refers to the shell material	Not mentioned = Fiberglass B = Concrete **P** = Polyethylene
R refers to the pump	Not mentioned = No pump (open bottom or Perforated bottom) **R** = With integrated pump

Therefore, the **STB-570PR** model refers to a polyethylene, watertight bottom Ecoflo® Biofilter with 61 ft² of filtering media surface and an integrated pump.

Table 4 displays all the Ecoflo® Biofilter ST/STB Models Series available for Delaware market:

Table 4 - Ecoflo® Biofilters ST/STB Model Series for Delaware



	Fiberglass Biofilter Shell	Concrete Biofilter Shell	Polyethylene Biofilter Shell
Open Bottom	ST-500 ST-650	N.A.	ST-570P ST-730P
Watertight Bottom - Gravity discharge	N.A	STB-650B	STB-570P STB-730P
Watertight Bottom - Pumped discharge	N.A.	STB-650BR	STB-570PR STB-730PR

Consult the Technical Data Sheet at ***ptzone.premiertechaqua.com*** for additional information on these models, such as storage capacities, dimensions, weight, etc.

In Delaware, a maximum hydraulic loading rate (HLR) of 8.6 US Gal/ft² per day can be applied on the filtering media surface of the Ecoflo® Biofilter. Therefore, Table 5 summarizes the system's capacity depending on the surface of filtering media.

Table 5 - Ecoflo® Biofilter capacity

Ecoflo® Biofilter ST\STB Model Series	Maximum Flow rate capacity (US Gal/d)	Suggested application for Delaware
500 (54 ft²)	up to 420	3 BR
570 (61 ft²)	up to 520	4 BR
650 (70 ft²)	up to 600	4 BR
730 (79 ft²)	up to 675	≥ 5 BR

Please contact your local PTA Regional Supervisor for model availability and approvals in your area.

3.7 Influent Pumping/lifting Station (if applicable)

When the wastewater between the septic tank and the Ecoflo® Biofilter cannot be conveyed by gravity, a pumping station must be installed between the two units. Like the septic tank, the pumping station must also be watertight in order to prevent groundwater infiltration. Premier Tech Aqua offers several models of pumping stations (PSA-240, PSA-240L, PSA-240H, PSA-240NP, PSX-240).

Premier Tech Aqua recommends sending approximately 8 to 10 US Gal. of wastewater to the Ecoflo® Biofilter every pump dosing cycle. For more information on the pumping stations, please consult the Peripherals section which can be found at ***ptzone.premiertechaqua.com***.

3.8 Dosing units for Commercial, communal and institutional applications

All commercial installation with 3 or more Ecoflo® Biofilters should be equipped with a timed dosing unit and an overall pumping totalizer, or a flow meter.

Premier Tech Aqua has developed a complete line of related products to increase the performance of the biofilter and any septic system. Please consult the Peripherals Catalogue at ***ptzone.premiertechaqua.com*** for Premier Tech Aqua's complete list of products.

3.9 Discharge pump (when applicable)

As presented in Table 3 and 4, the Ecoflo® Biofilter models housed into either concrete or close-bottom polyethylene shell include a discharge pump vault. It allows to pump the final treated effluent towards the site-specific final dispersal/disposal method. The dosing can be accomplished on demand.

The integrated pump vault includes a pump, a float tree on which, an ON/OFF float, and alarm float are attached and an alarm box.

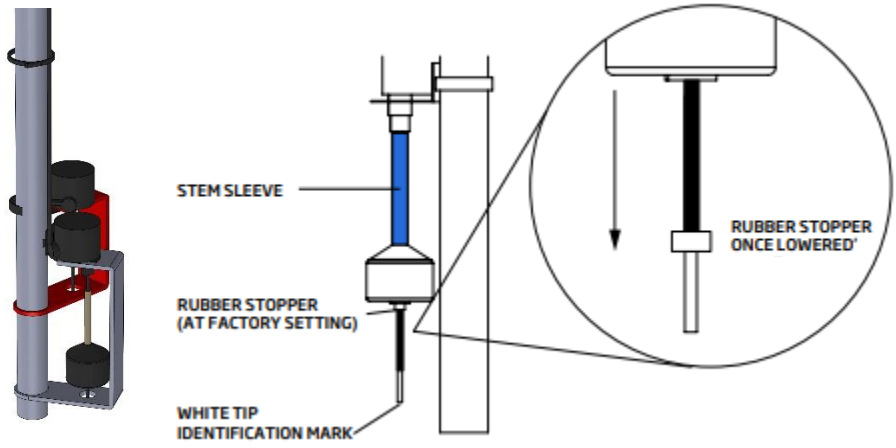
The models listed in Table 6 offer a certain built-in capacity for dosing and storage in case of emergency. In such a case, water can be accumulated for a limited period of time in the filter bed without adversely affecting the performance of the system. These are presented on products respective technical data sheets.

Table 6 - Summary of Ecoflo® Biofilter Model Design Parameters

Models	STB-500B	STB-570P	STB-650B			STB-730P
Unit size	49 ft² (5 m²)	61 ft² (5.7 m²)	70 ft² (6.5 m²)			78 ft² (7.3 m²)
Shell Material	Concrete	Polyethylene	Polyethylene Concrete			Polyethylene
Design Flow	420 GPD	520 GPD	600 GPD			675 GPD
Emergency Storage Capacity (above alarm float up to inlet pipe)	900 USG	1,200 USG	**H1**	**H2**	**H2+3**	1,400 USG
			1,166 USG	1,166 USG	1,166 USG	
Available Volume for Dosing	100 USG	115 USG	**H1**	**H2**	**H2+3**	155 USG
			125 USG	340 USG	470 USG	

As shown in Figure 1, to increase the volume dosed is necessary either cut the stem sleeve or decrease the rubber stopper following the installation guide recommendations. For pump to gravity distribution we recommend, theoretically, a dose volume of ¼ of daily design flow, 4 times a day.

Figure 1 - Float tree and float adjustment for STB-650-BR



Depending on application and site conditions, additional volume for dosing and/or emergency may be required and provided with an additional independent dosing tank.

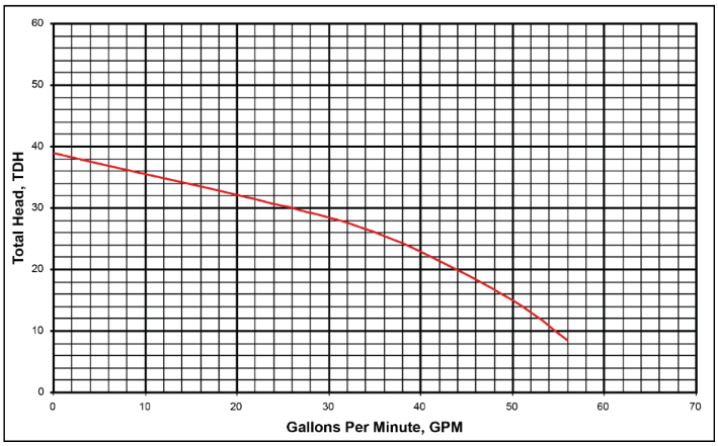
Consult the Technical Data Sheets at ptzone.premiertechaqua.com for additional details on integrated pump vault for these models, such as built-in storage and dosing capacities, dimensions, etc.

The pump provided are the following:

- **Polyethylene units** (STB-570PR, STB-650PR STB-730PR)

0.4 HP
6.6 Amps
1 phase, 60 Hz, 115 V

The figure on the right represents the performance curve of the pump supplied with the Ecoflo Biofilter with integrated pump. Note that this curve was obtained with clear water, the pump might not perform as well with wastewater. If you have questions about the interpretation of this curve, please do not hesitate to contact Premier Tech Aqua.



The pumping unit uses 0.25 kWh per day.

The maximum length of the pressurized pipe (flexible pipe) from the pump's outlet, depends on the head (difference in elevation between the Ecoflo outlet and the end of the pressurized pipe) and is limited by the volume of water that returns to the Ecoflo® Biofilter once the pump has stopped running.

Table 7 presents the different allowable pipe lengths between the Ecoflo® Biofilter unit and discharge location:

Table 7 - Allowable pipe lengths between the Ecoflo® Biofilter and the discharge location

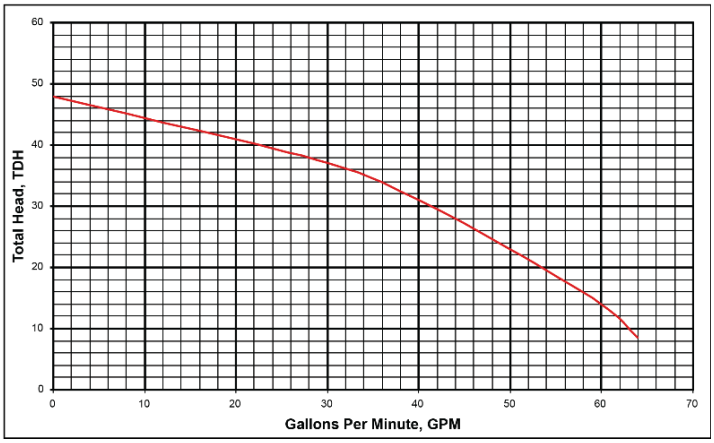
Head height	25’ (7,5 m)*	15’ (4,5 m)*
Maximum Ø 1" (25 mm) pipe length	10' (3 m)	80' (24 m)
Maximum Ø 1.5" (38 mm) pipe length	150' (30 m)	200' (60 m)

*At the Ecoflo outlet

- **Concrete units** (STB-650BR)

0.5 HP
6.6 Amps
1 phase, 60 Hz, 115 V

The figure on the right represents the performance curve of the pump supplied with the Ecoflo Biofilter with integrated pump. Note that this curve was obtained with clear water, the pump might not perform as well with wastewater. If you have questions about the interpretation of this curve, please do not hesitate to contact Premier Tech Aqua.



The pumping unit uses 0.25 kWh per day.

The maximum length of the pressurized pipe (flexible pipe) from the pump's outlet, depends on the head (difference in elevation between the Ecoflo outlet and the end of the pressurized pipe) and is limited by the volume of water that returns to the Ecoflo® Biofilter once the pump has stopped running.

Table 8 presents the different allowable pipe lengths between the Ecoflo® Biofilter unit and discharge location:

Table 8 - Allowable pipe lengths between the Ecoflo® Biofilter and the discharge location

Head height	25’ (7,5 m)*	15’ (4,5 m)*
Maximum Ø 1" (25 mm) pipe length	70' (21 m)	135' (40 m)
Maximum Ø 1.5" (38 mm) pipe length	200' (60 m)	200' (60 m)

*At the Ecoflo outlet

Shall another pump be required, warranty in case of system malfunction or deficiency related to a pump failure will be void.

3.10 Flow divider (If applicable)

When an installation consists either of two Ecoflo® Biofilter units which cannot be fed by gravity or of 3 or more Ecoflo® Biofilter units, a special attention shall be given to even flow distribution between the units.

Premier Tech Aqua offers several pressurized flow dividers. For more information on *Premier Tech Aqua’s pressurized flow divider, consult the Peripherals Section at* ***ptzone.premiertechaqua.com***.

3.11 Commercial Application

The Ecoflo® Biofilter can also be used for commercial, institutional, communal or municipal applications when the wastewater to be treated is comparable to domestic wastewater. Please contact Premier Tech Aqua's customer service for more information on these applications.

3.12 Life Span of Filtering Media

The effective life of the Ecoflo® Biofilter filtering media is estimated to a **minimum of 8 years** under the following conditions:

- System has been operated at or under design flow and loadings;
- System has been designed and installed in accordance with Premier Tech Aqua guidelines;
- System has been maintained in accordance with Premier Tech Aqua guidelines, by a Premier Tech Aqua trained service provider, been operated under an ongoing service contract and is in compliance with all Administrative Authority permit conditions.

After 8 years, the filtering media is analyzed by one of Premier Tech Aqua authorized agents. Under normal usage, if the filtering media has not been abused and the operating guidelines have been respected, the filtering media may not have to be replaced and can be used for some additional years. However, the Ecoflo® Biofilter’s filtering media must be replaced before the system's treatment capacity and performance begins to deteriorate. The filtering media is easily pumped out using a truck adapted to pump out septic tank sludge. The new filtering media is then installed by an authorized agent or the pumper.

3.13 Final Dispersal

The final dispersal system must be designed in accordance with Premier Tech Aqua guidelines and/or State or Local regulations.

4 Location of Wastewater System Components

4.1 Septic Tank Installation Conditions

The septic tank, equipped with an effluent filter, must be located:

- Where there is no motorized circulation;
- Where it is accessible at all times for maintenance and emptying;
- In an area that is not likely to be flooded and where it will not be submerged (depending on the situation, a drain may be required around the septic tank to prevent its installation in ground water).

The septic tank must be installed as specified by the manufacturer. The septic tank must be watertight and be used for disposal of domestic wastewater only (i.e. no roof water, surface water or discharge from footing drains). The septic installation must be installed in accordance with the minimum clearance prescribed by local regulations.

4.2 Ecoflo® Biofilter ST/STB Model Series Installation Conditions

The Ecoflo® Peat-Based Biofilter must be installed according to the following recommendations:

- NEVER cover or bury the lid of an Ecoflo® Biofilter;
- NEVER connect a drain pipe, roof gutter, sump pump or air conditioning drain to your septic system;
- Make sure the ground cover grows back quickly to prevent soil erosion;
- The Ecoflo® Biofilter must be installed in a location that is never likely to be flooded or submerged by groundwater. If this is the case, the concrete Ecoflo® Biofilters should be used. If required, please contact our Customer Service Department for more information on that subject;
- Ensure the profile of the final grade around the Ecoflo is such that water flows *away* from the system.

Table 9 - Minimum distances to respect for Ecoflo® Biofilter

Reference Point	Ecoflo® Biofilter Fiberglass	Ecoflo® Biofilter Polyethylene	Ecoflo® Biofilter Concrete
Riser Allowance	No additional riser allowed	No additional riser allowed	Maximum one 8" additional riser
Bottom of a talus, surplus backfill (A)	16' (5 m)	13' (4 m)	10' (3 m)
Parking area (B)	16' (5 m)	13' (4 m)	10' (3 m)
Vehicle or object weighting more than 500 lb (C)	16' (5 m)	13' (4 m)	10' (3 m)
Retaining Wall (D)	16' (5 m)	13' (4 m)	10' (3 m)
Tree	10' (3 m)	N/A	N/A
Finished landscaping vs. base of Ecoflo lid (E)	2" (50 mm)	2" (50 mm)	2" (50 mm)
Groundwater vs. base of Ecoflo unit (Fp) (See Figure 3)	12" below the bottom the Ecoflo	Up to the base of the Ecoflo	- Gravity: Up to the base. - Pumped: Below inlet invert

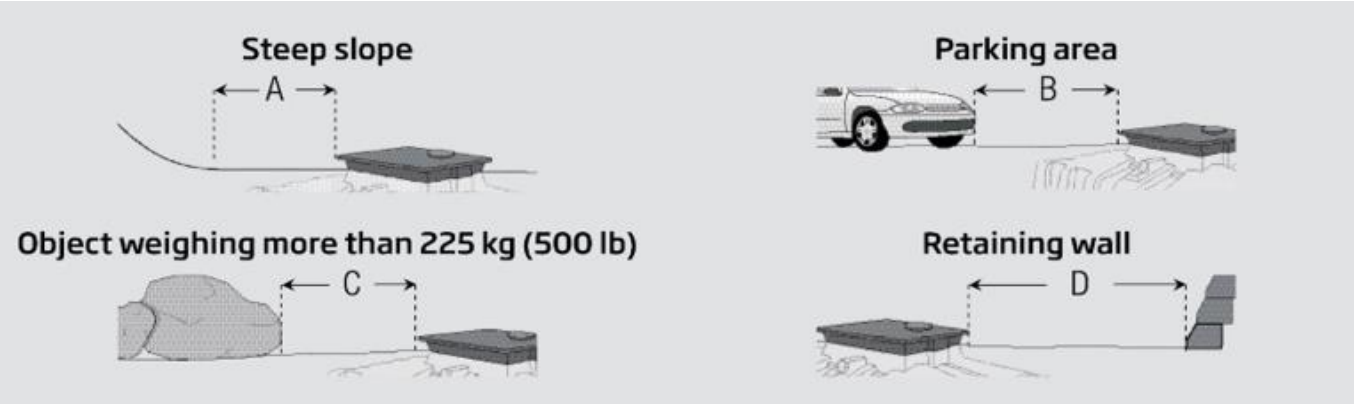
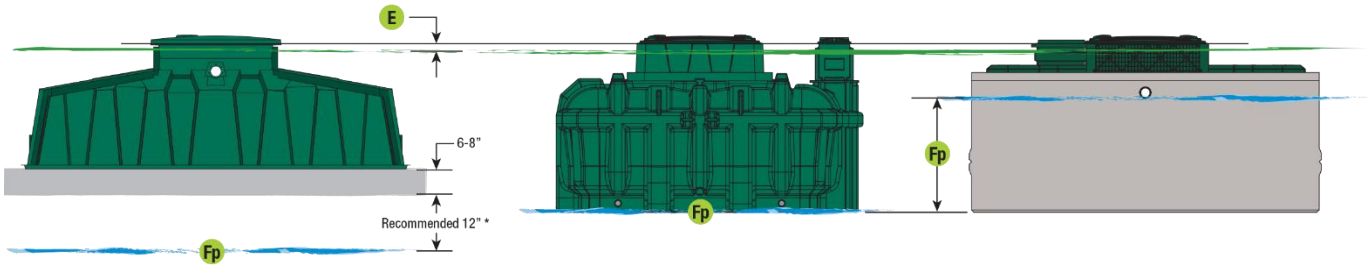


Figure 2 Seasonal High Groundwater (SHGW) levels to respect for Ecoflo® Biofilters installations



* Could be not less than 6" if permitted locally to be less than one foot.

For the installation of polyethylene models, it is important that the unit is adequately anchored in place before backfilling following Premier Tech Aqua's procedure provided in the Installation Guide.

It is very important to advise everyone involved (installer, landscaper, owner, snow removal service, etc.) of the above recommendations so they do not damage the components of the wastewater treatment system.

By respecting these guidelines, you are contributing to the proper operation of your wastewater treatment system. Failure to abide by these guidelines may, at Premier Tech Aqua's discretion, render the warranty invalid.

5 Effluent Discharge Design

IMPORTANT! THIS IS A CRUCIAL STEP FOR EVERY SEPTIC INSTALLATION.

The Ecoflo® Biofilter provides a variety of disposal/dispersal methods of the treated effluent (according to the local regulations).

Here are some methods suggested by Premier Tech Aqua:

- Subsurface discharge towards, but not limited to, trenches, an infiltration bed/pad, a drip irrigation system or any type of gravel-less system, etc.;
- Surface discharge when conditions and regulations permit it;
- Discharge towards another treatment system for further treatment such as disinfection.

Ecoflo® Biofilter treated effluent can be discharged either by gravity or pumped to the final dispersal, discharge method or a disinfection process.

Generally, with the open bottom Ecoflo® Biofilter models (ST models), the treated effluent is discharged directly beneath the biofilter. For close-bottom models (STB models), the treated effluent can be discharged either by gravity or pumped towards the disposal/dispersal method or a final polishing process.

5.1 Subsurface Discharge

The Ecoflo® Biofilter may be installed for new and replacement systems as disposal systems, or as an advanced treatment unit followed by a trench disposal system or drip irrigation disposal system.

Always consider the following recommendations when designing and installing the subsurface dispersal area:

- Soil assessment must be performed in accordance with local regulations in order to determine the type of soil as well as the depth of any limiting layer (groundwater, bedrock or impervious layer);
- When referring to groundwater, the **Seasonal High Groundwater Level** (SHGL) must be taken into account;
- The profile of final grade must be such that runoff water flows away from the septic system;
- The shape of the soil absorption system **may vary** according to site conditions;

- Various means can be used to promote infiltration in low permeability soils. Contact your local distributor or Premier Tech Aqua for suggestions.

5.1.1 Site and soil assessment

Site assessment and soil conditions are critical to determine the appropriate type of treated effluent discharge. An accurate assessment of the soil's hydraulic conductivity is essential in planning any septic installation. This assessment should be performed in accordance with local regulations and will determine if subsurface discharge is possible. Adequate sizing of the soil absorption system relies on the determination of the soil's infiltrative capacity and will ensure adequate infiltration of the treated effluent into the soil at all times. The soil's infiltrative capacity is often expressed as a percolation rate (average time in minutes that is required for water to drop one centimetre in the soil), which can be determined by a qualified individual through a field permeability test, a laboratory soil particle-size analysis, or any other method approved by local regulations. Soil permeability and analysis is most important within the horizon intended to be the point of application of the treated effluent.

Site and soil assessment must be conducted by competent and duly authorized person as per local regulation.

5.1.2 Required effective soil depth or vertical separation to limiting layer

As per section 6 of Delaware Ecoflo® Biofilter approval, a minimum of 12” separation distance must be maintained between the bottom of the 6 to 8” stone layer, covering the infiltration area and the limiting zone.

For backfilling and cover to final grade, please refer to Ecoflo® Biofilter Installation Guides.

5.1.2.1 Standard installation

For standard installation Ecoflo® Biofilter treated effluent can be dispersed either in 10” depth trenches (Figure 3 and 4) or 6-8” depth pad (bed) (Figure 5 and 6).

Figure 3 - Design Ecoflo® Biofilter pumped discharge to trenches

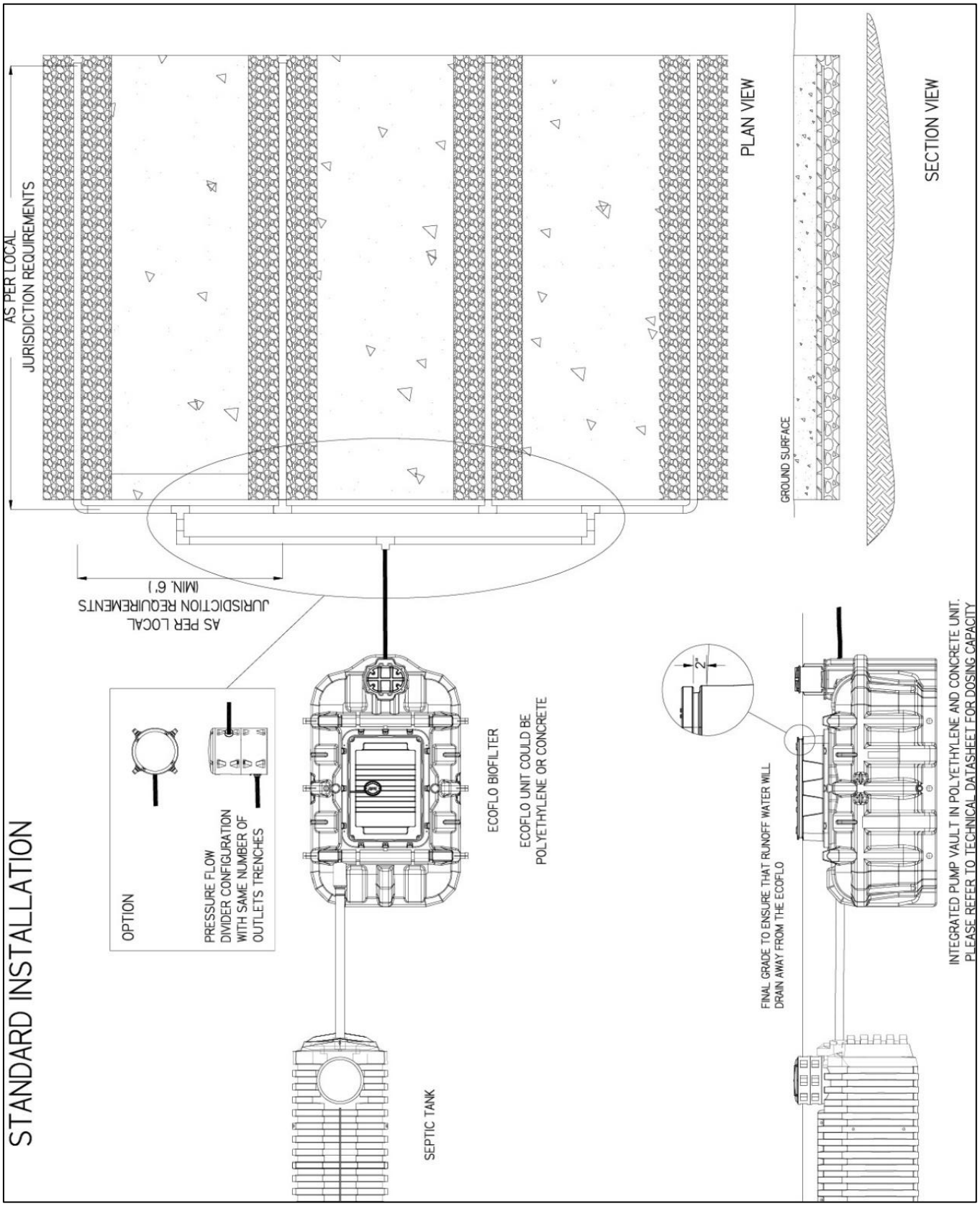


Figure 4 - Design Ecoflo® Biofilter gravity discharge to trenches

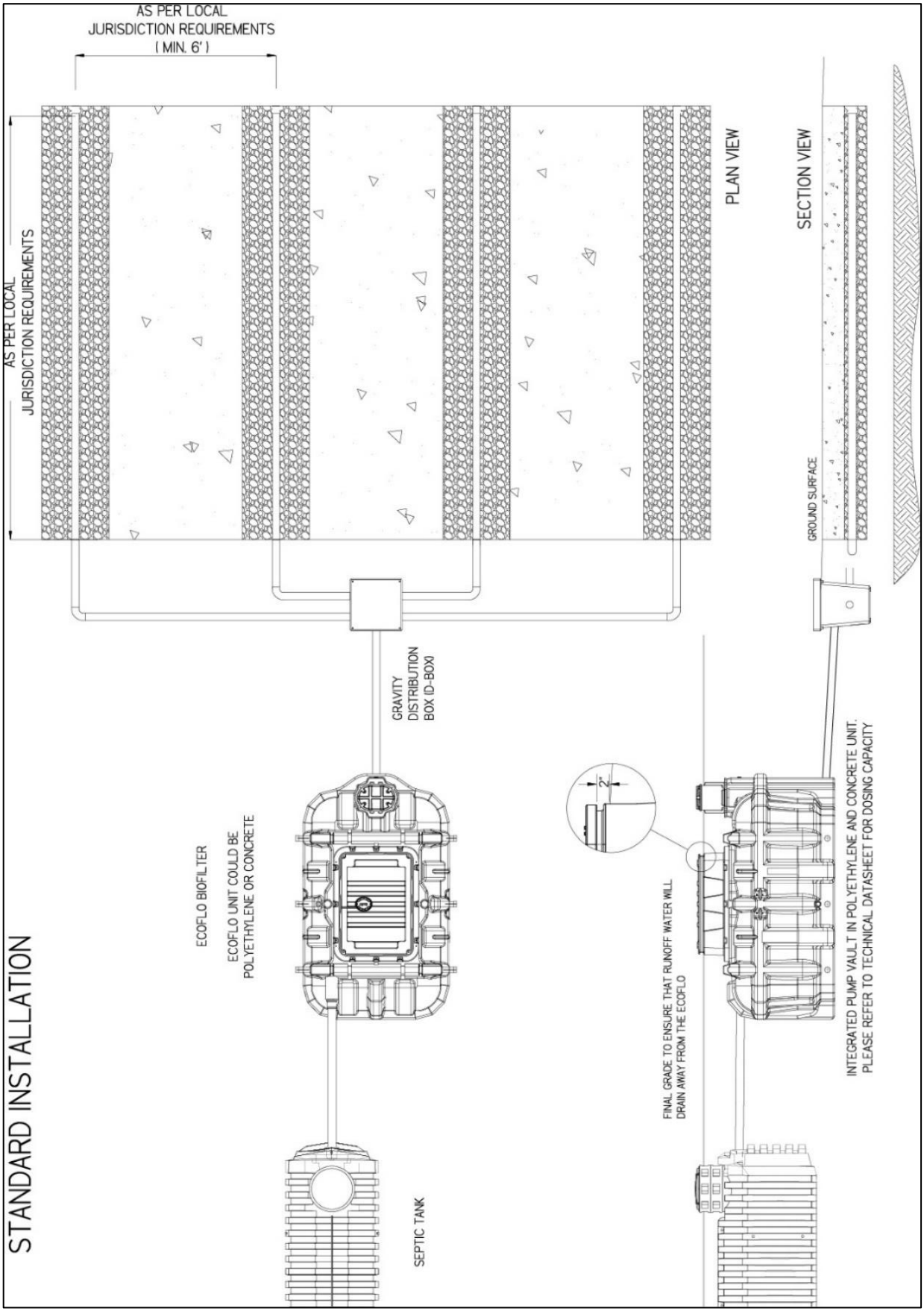


Figure 5 - Design Ecoflo® Biofilter pumped discharge to pad

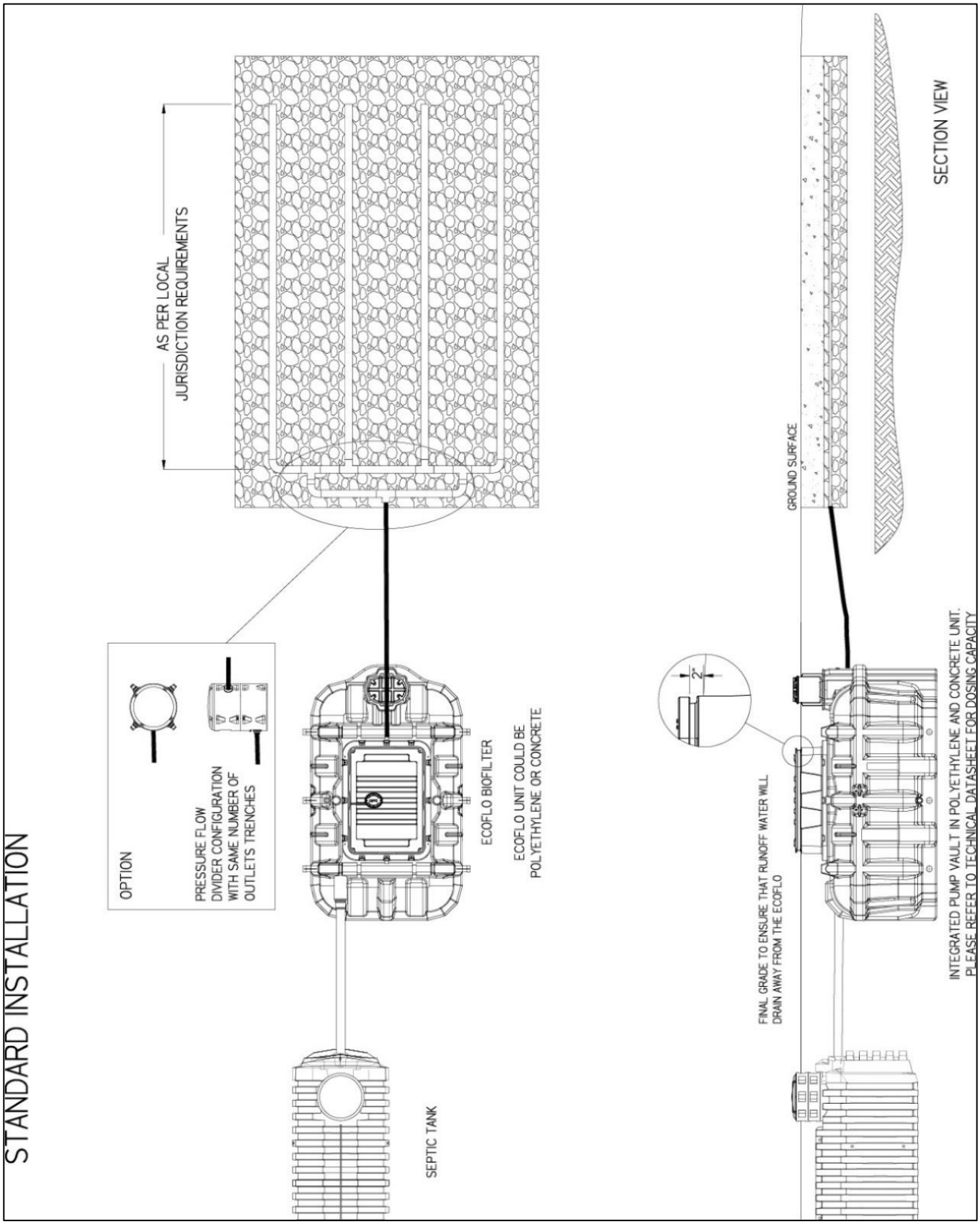
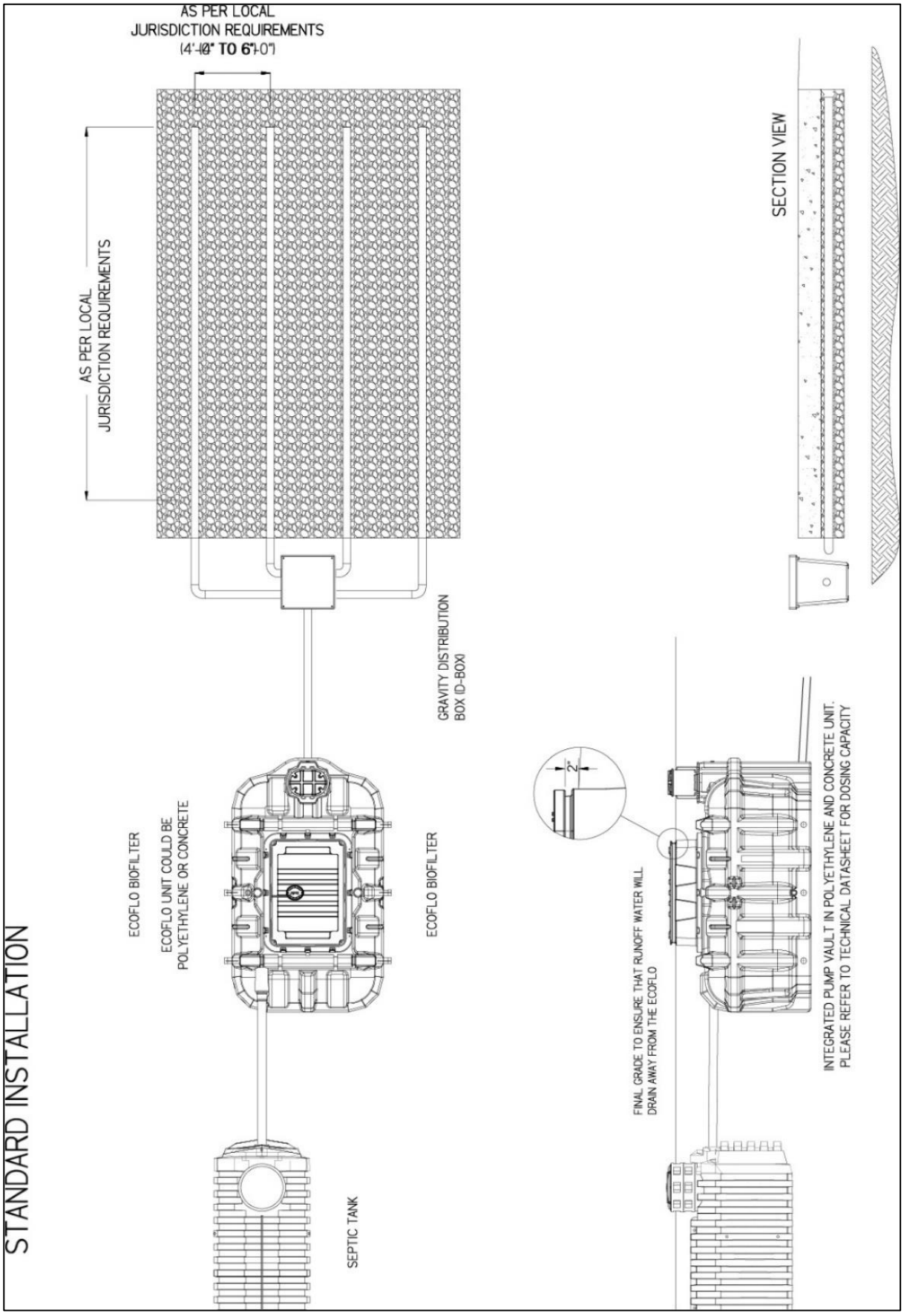


Figure 6 - Design Ecoflo® Biofilter gravity discharge to pad



5.1.2.2 Surface installation (at-grade systems)

For surface installation, only pads are allowed. A 12” separation distance to the limiting zone must be maintained (Figure 7, 8 and 9).

Figure 7 - Design Ecoflo® Biofilter pumped discharge to pad-surface

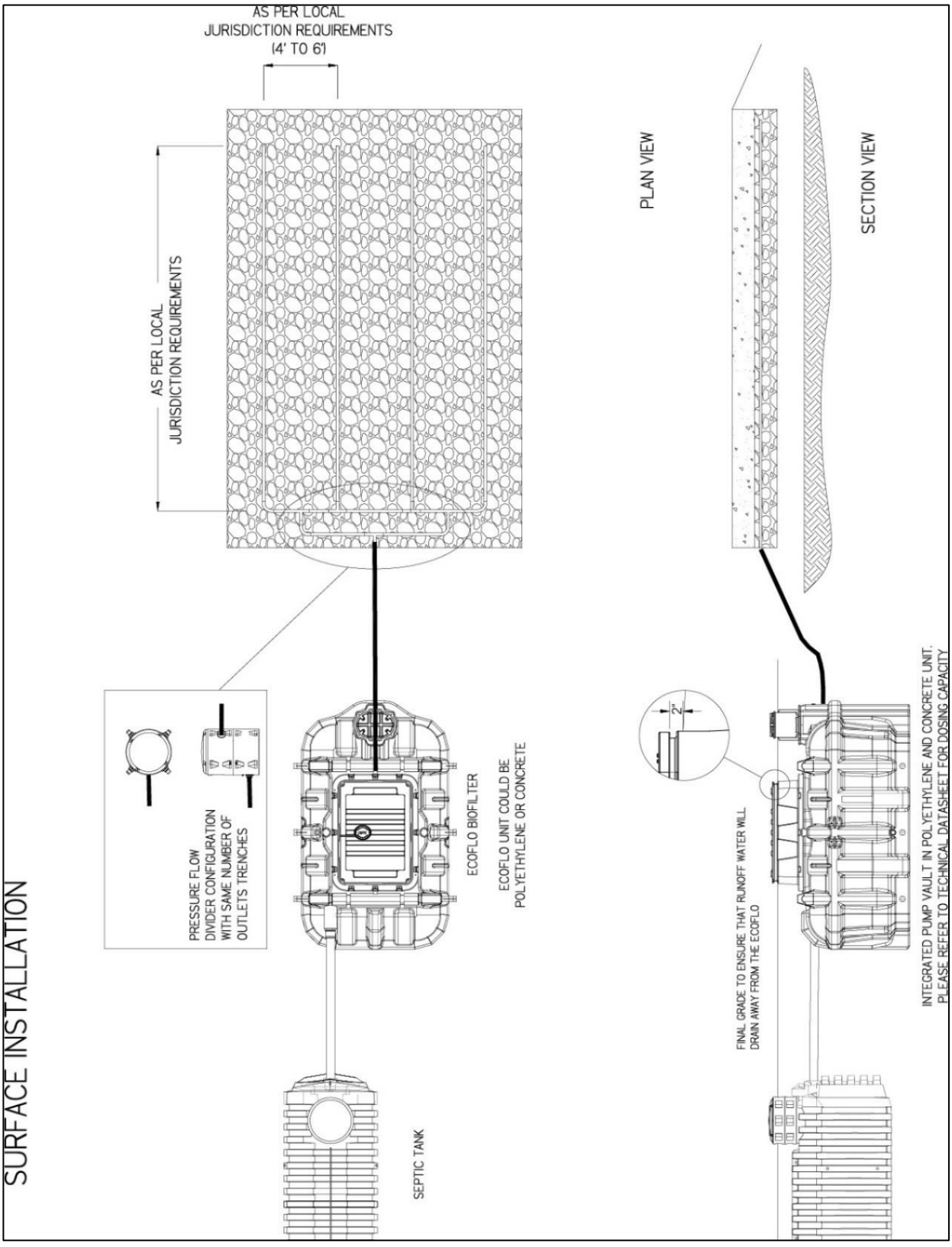


Figure 8 - Design gravity fed open-bottom Ecoflo® Biofilter

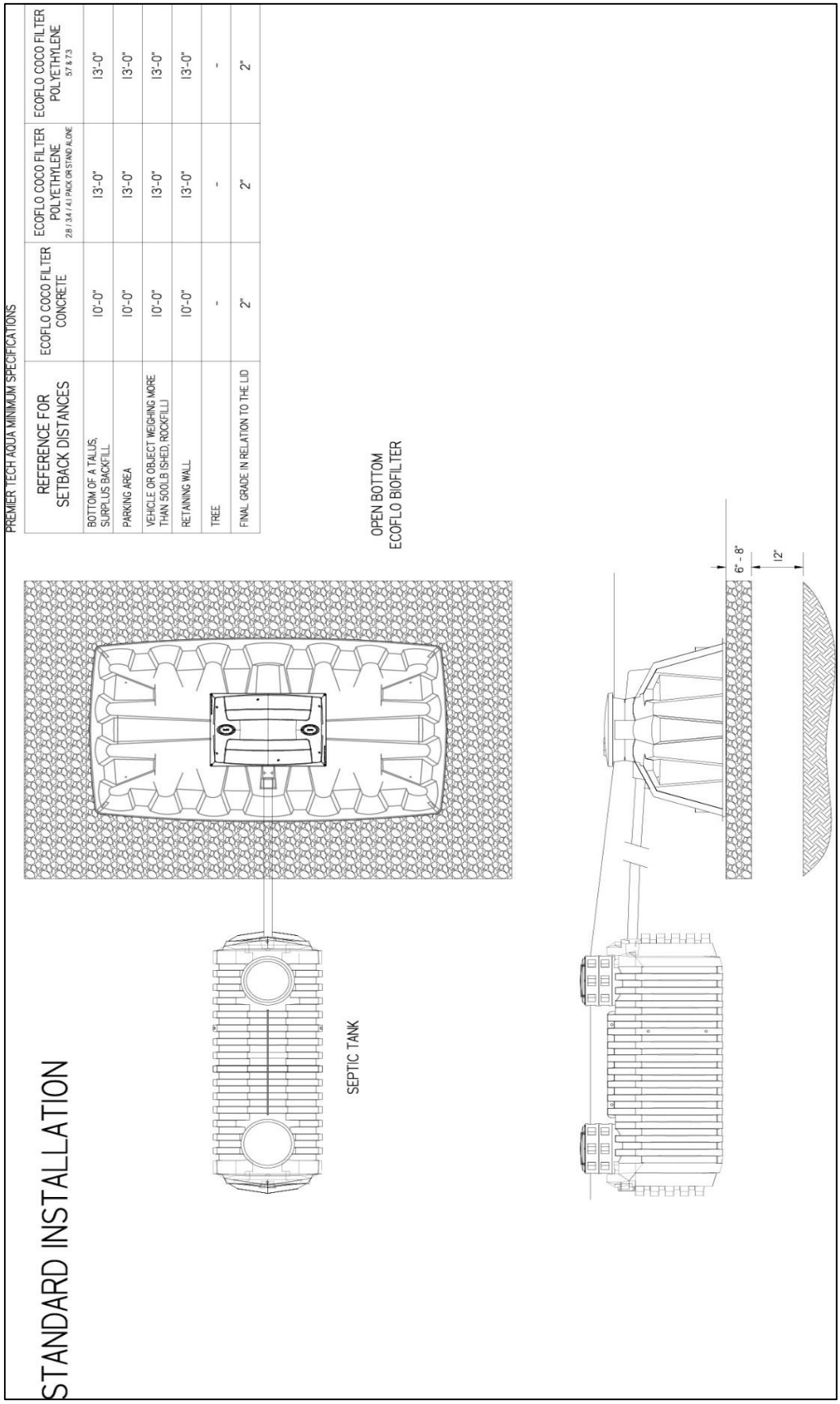
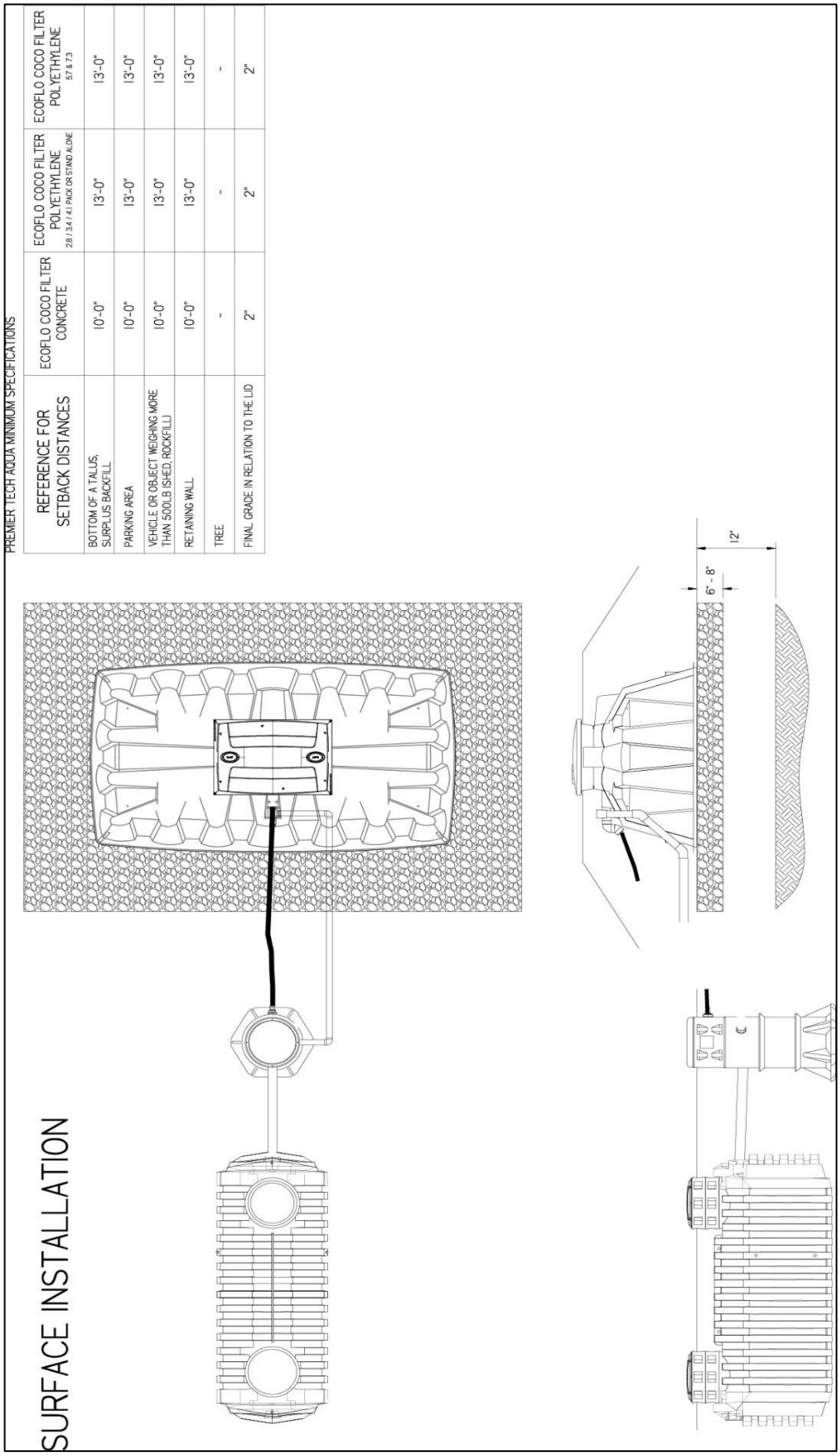


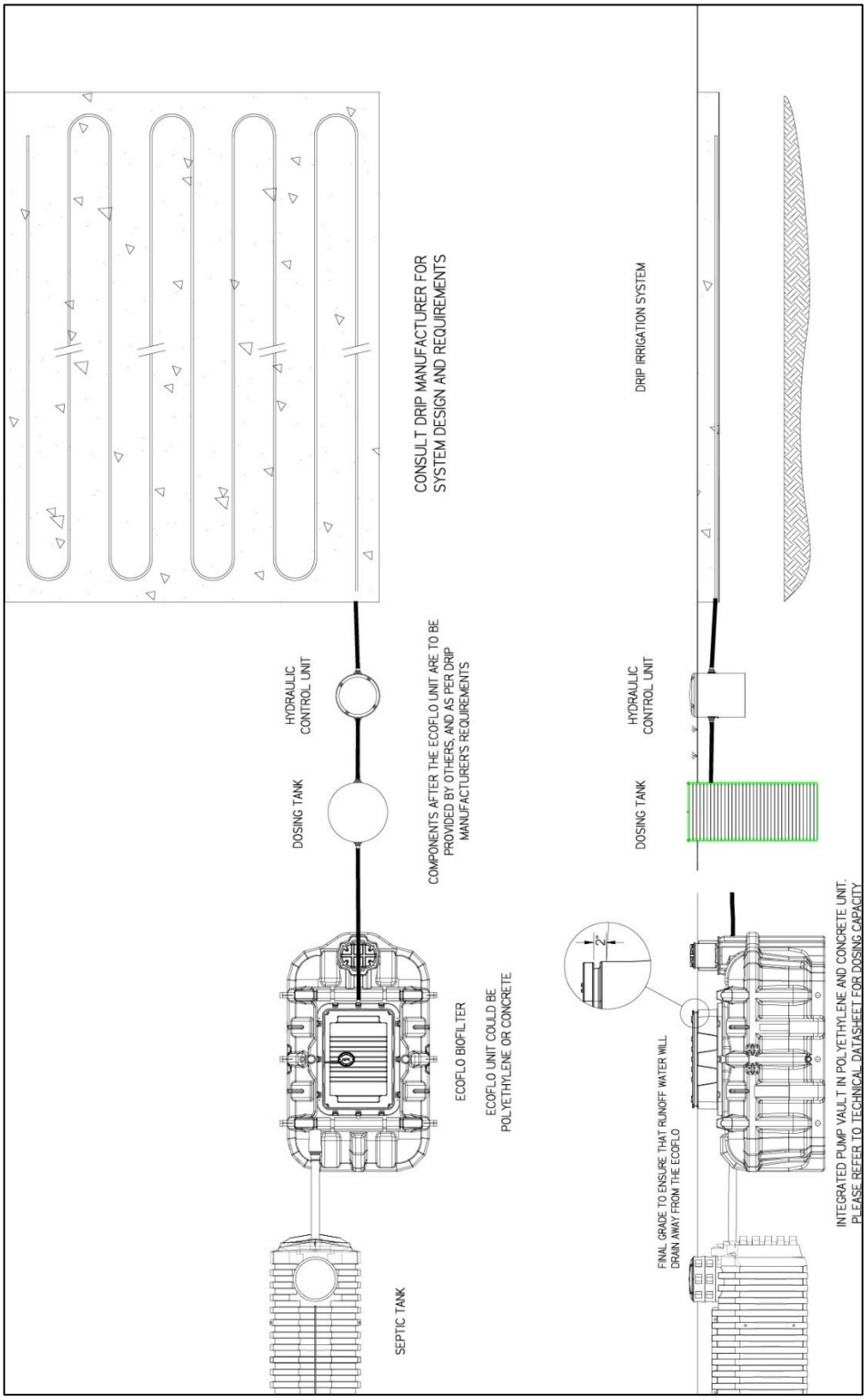
Figure 9 - Design pumped fed open-bottom Ecoflo® Biofilter



5.1.2.3 Drip

Minimum vertical separation 18” to limited layer should be maintain for drip dispersal. Drip dispersal system shall be installed within the first 6” depth of soil (Figure 10). A dosing tank is required to regulate the flow to the drip dispersal system. All drip dispersal components shall be design as per drip manufacture specifications.

Figure 10 - Design Ecoflo® Biofilter Pumped Discharge to Drip Irrigation



5.1.3 Soil Absorption System

Once the soil characteristics have been established, determine the **size of the soil absorption system** required to receive the treated effluent of the Ecoflo® Peat-Based Biofilter(s). The **shape** of the soil absorption system **may vary** depending on site constraints.

As per section Delaware Code Chapter 60 EXHIBIT-BB and Delaware Ecoflo® Biofilter Approval, the size of the subsurface system for final disposal of the Ecoflo® Biofilter, can be reduced by 33% as compared to conventional bed and trenches respectively. Table 9 presents the soil loading rate factors for the Ecoflo® Biofilter. A comparison of these loading rate factors as compared to conventional systems is also provided.

It is important to note that peat systems are allowed in soil with a percolation rate lesser than 20 mpi.

Table 10 - Long-term acceptance rate for Delaware

LTAR (GPD/ft²)					
Percolation Rate	Gravity		Peat		Drip
(mpi)	Bed	Trench	Bed	Trench	
5	-	-	1.597	2.033	0.303
10	-	-	1.129	1.437	0.278
15	-	-	0.922	1.174	0.253
20	0.532	0.678	0.799	1.016	0.228
25	0.476	0.606	0.714	0.909	0.211
30	0.435	0.553	0.652	0.803	0.203
35	0.402	0.512	0.604	0.768	0.196
40	0.376	0.479	0.565	0.719	0.189
45	0.355	0.452	0.532	0.678	0.18
50	0.337	0.429	0.505	0.643	0.13
55	0.321	0.409	0.482	0.613	0.162
60	0.307	0.391	0.461	0.587	0.154
65	0.295	0.376	0.443	0.564	0.146
70	0.285	0.362	0.427	0.543	0.139
75	0.275	0.350	0.412	0.525	0.133
80	0.266	0.339	0.399	0.508	0.127
85	0.258	0.329	0.387	0.493	0.122
90	0.251	0.319	0.376	0.479	0.117
95	0.244	0.311	0.366	0.466	0.116
100	0.238	0.303	0.57	0.455	0.105
105	0.232	0.296	0.349	0.444	0.096
110	0.227	0.289	0.341	0.433	0.088
115	0.222	0.283	0.333	0.424	0.08
120	0.217	0.277	0.326	0.415	0.073

Source: Regulations governing the design, installation and operation of on-site wastewater treatment and disposal systems (2014)

5.2 Final Polishing Process

When required and if local regulations permit it, the Ecoflo® Peat-Based Biofilter can be combined with Premier Tech Aqua's disinfection unit (DiUV) to reduce pathogen concentrations. For more information on PTA's DiUV, please consult *ptzone.premiertechaqua.com*.

If you have any questions or comments, do not hesitate to contact Premier Tech Aqua at 1 800 632-6356.

PREMIER TECH AQUA
1 800 632-6356
418 862-6642
pta@premiertech.com
PREMIERTECHAQUA.COM