

Approved Manual and Installation Guide for Sub-Surface Ecoflo® Biofilters

On-Site Sewage Disposal Systems
Manufactured by
Premier Tech Aqua

Prepared for
Nova Scotia Environment
by
Premier Tech Aqua

May, 2014

This installation guide includes technical information relative to the design and the installation of the different Ecoflo® Biofilter models. The first section includes a Technical Data Sheet presenting for all the Ecoflo® Biofilter models, their components, dimensions, etc. The second section is specific to the design of the different Ecoflo® models and provides examples of typical installations; the third section provides the installation instruction for the different Ecoflo® models.

This document has been developed by Premier Tech Aqua (PTA) to include specific references and pertinent information for the design and installation of Ecoflo® Biofilters in the Province of Nova Scotia. Systems must be designed and installed in accordance with the Nova Scotia Environment “On-site Sewage Disposal Systems, Technical Guidelines” dated 1 April 2009, and any future amendments. Where this document does not indicate information on a specific point, the designer and installer shall use the Technical Guidelines standard on the point as the minimum requirement. However, if different standards are stated on any point in this document, compared to the Technical Guidelines (such as effluent filters being required on the outlet of the septic tank), the requirements in this document shall govern.

General literature published by PTA frequently refers to these units being certified under an “NQ 3680-910” standard for an advanced secondary treatment system. Such references are not applicable in Nova Scotia where this Approved Manual and Installation Guide, together with the Nova Scotia Technical Guidelines and the On-Site Sewage Systems Regulations made under the Nova Scotia *Environment Act* and *Health Act*, are the only official documents related to the design and installation of Ecoflo® Biofilters in Nova Scotia.

Reference to PTA septic tanks, pumping stations, and accessories in this document signify approval for use in Nova Scotia only as integral components involved in installation of Ecoflo® Biofilters in Nova Scotia. Such units may be used in other applications where regular Approval of such component(s) has been given and the item(s) registered as Approved Product in Appendix L of the Technical Guidelines.

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Technical Introduction

IMPORTANT! THIS INTRODUCTON PROVIDES CRITICAL INFORMATION AND CLARIFCATION OF TERMS THAT NEED TO BE READ AND UNDERSTOOD IN ORDER TO ENSURE PROPER USE OF THIS MANUAL

CLARIFICATION

Ecoflo Biofilter shell can be made of various materials such as, but not limited to: fibreglass, concrete, polyethylene, etc. Ecoflo® Biofilter models are designed for a maximum hydraulic loading rate of 230 L/m² per day in term of surface of filtering media or 290 L/m³ per day of volume of organic filter medium.

All Ecoflo® Biofilters with open bottom (See PART II A of this Manual) are designed as Sub-Surface Discharge Systems.

An Ecoflo® Biofilter with collecting bottom (See PART II B of this Manual) can discharge to an absorptive bed where soil conditions (e.g. allowable vertical Hydraulic Loading Rate) allow *for total acceptance of the complete flow by the in-situ sub-soils* and thus are considered Sub-Surface Discharge Systems.

Sizing of the absorptive bed for these systems is based on the design principles and criteria (e.g. Hydraulic Loading Rates for various soil types) provided in PART II of this manual.

Sub-Surface Discharge

This term applies to disposal methods for an effluent where the design allows *for total acceptance of the complete flow by the in-situ sub-soils*. In Sub-Surface Discharge design calculations the absorptive area bed is sized based on the design flow (L/day) and the (allowable) vertical Hydraulic Loading Rate (L/m²/day) of the on-site sub-soils accepting the flow.

Surface Discharge

This term applies to disposal methods for an effluent where the design does not allow *for total acceptance of the complete flow by the in-situ sub-soils*. In Surface Discharge Design some or all of the design flow is presented as a surface flow. Examples of surface discharge include:

- pipe discharge to a receiving water;
- pipe discharge to a ditch;
- a perforated pipe installed in a gravel trench or French Drain where part of flow is accepted into the sub-soils along length of the gravel area but the total flow is not directly accepted into the sub-soils;
- discharge through a toe drain.

**** THIS MANUAL DOES NOT ADDRESS SURFACE DISCHARGE ****

PART I – Ecoflo® Biofilter Technical Data Sheet

Ecoflo® Biofilter - Fiberglass

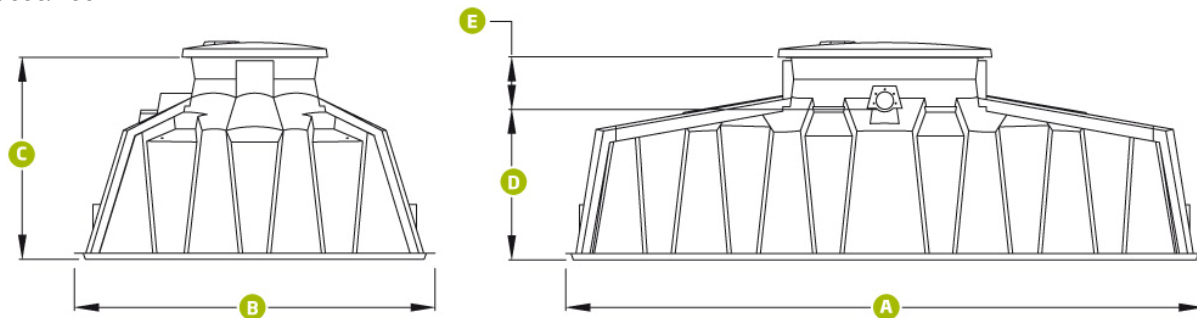
Material used

- **Shell:** fiberglass and polyester resin composite;
- **Lid, central support, tipping bucket, distribution plates and sampling device:** plastic;
- **Filtering media:** natural fibers.

Models	ST-500	ST-650	ST-750
Type of disposal	infiltration	infiltration	infiltration
Type of bottom	open	open	open
Length (A)	3 345 mm (11')	4 175 mm (13' 8")	4 675 mm (15' 4")
Width (B)	2 361 mm (7' 9")	2 361 mm (7' 9")	2 361 mm (7' 9")
Height (C)	1 320 mm (4' 4")	1 320 mm (4' 4")	1 320 mm (4' 4")
Inlet height (D)	970 mm (3' 2")	970 mm (3' 2")	970 mm (3' 2")
Inlet height (E)	350 mm (1' 2")	350 mm (1' 2")	350 mm (1' 2")
Outlet height (F)	---	---	---
Weight*	105 kg (230 lb)	125 kg (275 lb)	145 kg (320 lb)
Volume of filtering media	3.9 m ³ (138 ft ³) – 23 bags	5.2 m ³ (183 ft ³) – 30 bags	6 m ³ (212 ft ³) – 35 bags
Connections	Flexible, watertight and adapter to 100 mm Ø (4") SDR-35 and SCH-40 PVC pipes		

* Weights indicated are approximate and not binding (for handling and lifting purposes only).

ST-500/650/750



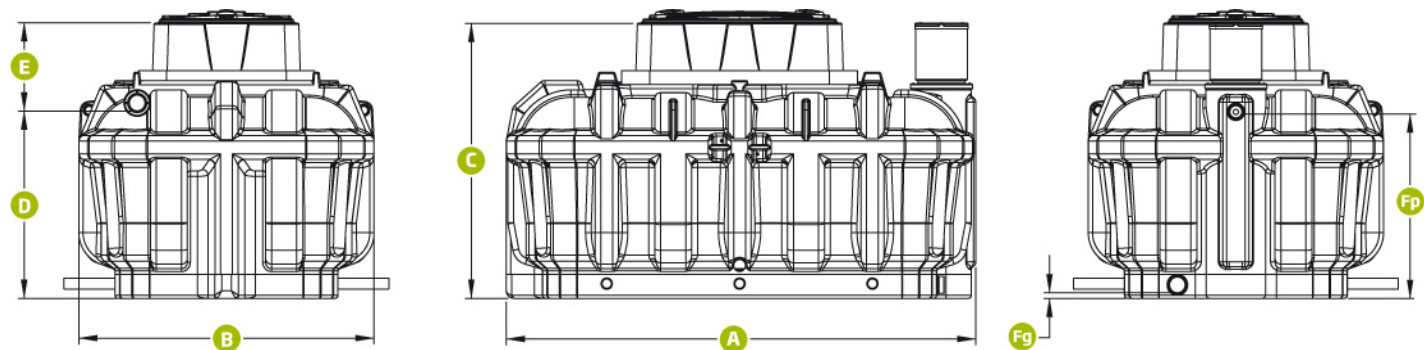
Ecoflo® Biofilter - Polyethylene

Material used

- **Shell:** polyethylene;
- **Lid, central support, tipping bucket, distribution plates and sampling device:** plastic;
- **Filtering media:** natural fibers.

Models	ST-570P	STB-570P	STB-570PR	ST-650P	STB-650P	STB-650PR	ST-730P	STB-730P	STB-730PR
Type of disposal	infiltration	gravity	pumped	infiltration	gravity	pumped	infiltration	gravity	pumped
Type of bottom	perforated	watertight	watertight	perforated	watertight	watertight	perforated	watertight	watertight
Length (A)	3 180 mm (10' 5")			3 920 mm (12' 10")			4 200 mm (13' 9")		
Width (B)	2 000 mm (6' 7")			2 050 mm (6' 9")			2 050 mm (6' 9")		
Height (C)	1 800 mm (5' 11")	1 850 mm (6' 1")		1 850 mm (6' 1")			1 850 mm (6' 1")		
Inlet height (D)	1 210 mm (4')	1 260 mm (4' 2")		1 260 mm (4' 2")			1 260 mm (4' 2")		
Inlet height (E)	590 mm (1' 11")			580 mm (1' 11")			580 mm (1' 11")		
Outlet height (Fg and Fp)	---	38 mm (1½")	1 240 mm (4' 1")	---	38 mm (1½")	1 240 mm (4' 1")	---	38 mm (1½")	1 240 mm (4' 1")
Weight* (including internal components and dry filtering media)	1 120 kg (2 460 lb)	1 190 kg (2 620 lb)	1 200 kg (2 640 lb)	1 250 kg (2 760 lb)	1 300 kg (2 870 lb)	1 310 kg (2 890 lb)	1 355 kg (2 990 lb)	1 405 kg (3 100 lb)	1 415 kg (3 120 lb)
Dosing volume	---	---	145 L (38 US gal)	---	---	165 L (44 US gal)	---	---	180 L (48 US gal)
Retention volume (between tank's bottom and under filtering media)	---	---	500 L (130 US gal)	---	---	660 L (175 US gal)	---	---	715 L (190 US gal)

* Weights indicated are approximate and not binding (for handling and lifting purposes only).



Handling

Fiberglass and Polyethylene Shell	Concrete Shell
4 lifting rings are located on top of the shell	2 hoisting grooves allow handling of the system with the proper hoisting equipment. The shell and the top tile can also be moved separately with the 4 hoisting rings on the top tile and 4 more rings inside the shell (on the bottom).

Treatment Efficiency – Ecoflo Effluent Quality (source: NSF bench test)

NSF cert.	Average	Std. Dev.	Min.	Max.	Median
BOD5	2	0.3	< 2	4	< 2
TSS	2	0.7	< 2	8	< 2
Fecals	185*	2 053	4	10 600	174

* Geometric mean

PART II – Ecoflo® Biofilter Design Guidelines

Approved Design Manual and Installation Guide- Nova Scotia

*This document contains the information required to plan and design the installation of the **Ecoflo® Biofilters – Open Bottom** in the Province of Nova Scotia. The design must be made by a Qualified Person Level 1. The installation must be performed by an on-site sewage system installer who is certified in Nova Scotia and who has been trained and accepted by PTA. You can get a list of currently certified and accepted installers by contacting our customer service at **1 800 6-ECOFLO** (1 800 632-6356).*

A) Installation procedure for the Ecoflo® Biofilter with OPEN BOTTOM - ST Series Models

1. System components description
2. Components location and special instructions
3. Effluent disposal method determination
4. Typical installations



1. System components description

1.1 Septic tank

Septic tanks must conform to Section 3.1 of the Nova Scotia Environment (NSE) On-Site Sewage Disposal Systems Technical Guidelines (hereafter referred to as 'Technical Guidelines') or be a PTA unit described in this document. Determine the required tank size according to the Technical Guidelines. **To optimize** the efficiency of any septic installation and extend the life of the treatment system, **we recommend** using a larger septic tank than that prescribed.

If a repair installation is proposed, two options are possible:

1. **Replacing the septic tank:** the new tank must be equipped with an **Effluent filter EFT-080** by PTA or **Polylok PL-122**. It is also possible to supply it with a **TAD-240** septic tank adapter, **PSR-060** or **PSR-140** risers and **LID-240** lids allowing easy access inside the septic tank and to the effluent filter. You can also use the **PST-420/500/660** high performance polyethylene septic tanks from PTA.
2. **Upgrading the existing septic tank:** the tank must be inspected to make sure that it is in good condition and an effluent filter must be installed in a separate filter container outside the tank. A **TAD-240 septic tank adapter** may also be installed to facilitate access inside the tank and to the effluent filter.

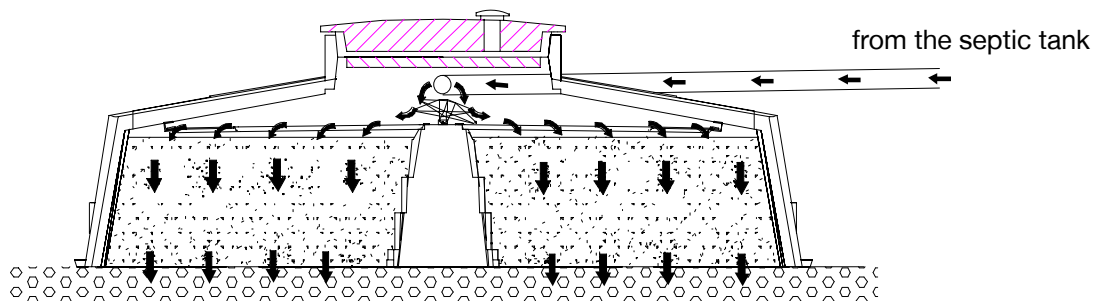
1.2 Effluent filter EFT-080 by PTA or Polylok PL-122

The use of an **effluent filter** is **mandatory with an Ecoflo® Biofilter**. The effluent filter models that meet this criterion are the **EFT-080** from PTA and the **Polylok PL-122**. **It is therefore strictly prohibited to use another type of effluent filter**. The effluent filter stops suspended solids from reaching the filtering media and the effluent pump, solids that could interfere with good functioning of operations. The effluent filter is usually installed in the second compartment of the septic tank, but may also be installed, in accordance with existing standards, in the **TLF-240 filter container by PTA**, which is placed after the septic tank and before the pumping station (if applicable). The effluent filter container must be installed in compliance with the clearance distances prescribed for septic tanks.

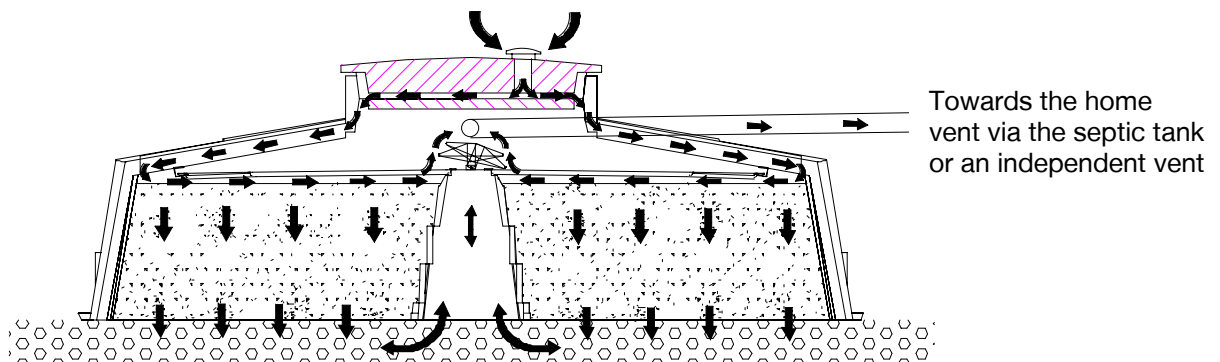
1.3 Ecoflo® Biofilter

The **Ecoflo® Biofilter** is a biofiltration system approved for use in Nova Scotia for the treatment of wastewater. It is always installed following a septic tank equipped with an effluent filter. The model and number of Biofilter units required is determined according to the design flow. According to Nova Scotia regulation, the all Ecoflo models are designed for a maximum hydraulic loading rate of 230 L/m² per day in term of surface of filtering media or 290 L/m³ per day of volume of organic filter medium. As such, select the type and number of Ecoflo units necessary to provide for at least the daily design flow.

1.4 General function of the system



Water flow diagram



Air flow diagram

The Ecoflo® Biofilter is designed to treat domestic wastewater after a primary treatment. This function is performed as the wastewater percolates through the peat based filtering media. It is absorbed briefly where beneficial aerobic microorganisms and fungus degrade the waste constituents and produce highly treated effluent.

To be treated, the wastewater goes first into the septic tank where it is submitted to a primary treatment and then it flows to the Ecoflo® Biofilter. The water is directed into an internal tipping bucket where effluent is dosed equally in one gallon increments onto the peat medium by specially designed distribution plates. The distribution plates are located on both sides of the central support. These plates include channels and orifices to distribute the effluent evenly on top of the filtering media. After, wastewater trickles down into the filtering media where its organic content is consumed by fixed bacteria before entering the absorption bed located underneath the Biofilter.

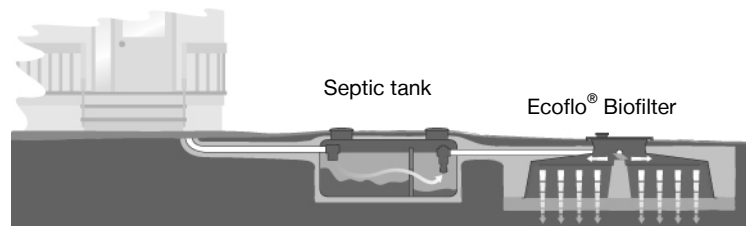
To be efficient, the system requires enough oxygen transfer for the bacteria to do their work. The aeration of the system is based on a gravity air flow as illustrated on the diagram above. The air intake is located on the lid of the biofilter and an independent vent assures the air flow through the system. Air comes into the system by the intake located on the lid. Then, it goes to the extremities of the filter bed via the shell's airflow ducts and circulates at the top of the filtering media underneath the distribution plates. It penetrates then into the filtering media via water infiltration. Also, a gas exchange occurs at the top and at the base of the filtering media promoting its oxygenation. The air coming out of the filtering media is evacuated by passing through the opening located at the top of the central support. Finally, it is conducted by convection to the home air vent via the septic tank.

1.5 Pumping Station (if applicable)

The Ecoflo® typically does not require a pump, but receives gravity-fed effluent from the septic tank. If the system requires a pumping station, a **PSA-240L Pumping Station** (or an approved product - in either case the standard requirements of the Technical Guidelines for pump chamber capacity shall be met) should be installed downstream of the septic tank and/or the effluent filter container, unless site conditions do not permit this configuration (see *PSA-240L Installation Guide* for information on its function and installation as example). Where it is necessary to pump to the septic tank, the additional standard requirements of the Technical Guidelines concerning septic tank type and size, discharge per pump cycle, discharge rate, and flow control must be observed. Like the septic tank, the pumping station must also be watertight to prevent groundwater infiltration. The amount of water released to each Ecoflo® Biofilter must be within 30 to 40 L (6.6 to 8.8 imp. gal.) per dosing.

2. Components location and special instructions

Components of a residential gravity-flow septic installation



2.1 Minimum clearance Distances prescribed by regulation

See Table 2.5 (A) of the Technical Guidelines for horizontal clearance distances applicable to all on-site sewage disposal systems in Nova Scotia, including PTA units. In addition, no trees are to be located within 2 m (6.5 ft) of the absorption bed, and, no motorized traffic or heavy loading is to be located within 3 m of the lid of the unit.

The use of the term “absorption bed” in this document has the same meaning as “disposal field” in the Technical Guidelines for the purpose of determining minimum clearance distances.

2.2 Installation conditions

Contact the septic tank manufacturer to see if they recommend a maximum installation depth. The septic tank must be watertight and receive only household wastewater in accordance with the Technical Guidelines.

Depending on the situation, an interceptor trench may be installed up slope/around the septic tank to prevent groundwater infiltration.

The **Ecoflo® Biofilter** must be installed in a place:

- Where soil conditions affecting the absorption bed are acceptable, as specified in Part II A Section 3.1.2;
- Where the area around the unit (and around the absorption bed if it is remotely located), has positive surface water drainage away from the unit and the bed;
- That is not subject to flooding or groundwater rise;
- Where it is accessible for pumping and maintenance.

The lid of the **Ecoflo® Biofilter** must be 50 mm (2") aboveground after the final landscaping has been completed. **It is important that all interested parties (installer, landscaper, owner, snow removal company) be advised of the following:**

- Never cover or bury the lid;
- Never overload the ground within 3 m (10') of the lid (e.g. vehicle, blown snow, embankment);
- Ensure rapid revegetation to prevent soil erosion.

3. Effluent disposal method determination

Important! THIS IS A CRUCIAL STEP IN ANY SEPTIC INSTALLATION

3.1 Subsurface disposal

3.1.1 Natural soil and site characterization

The **Ecoflo® Biofilter** system requires a design by a QP1 certified in Nova Scotia. The design process includes, among others, consideration of the site topography, the gradient of the receiving ground, the soil permeability as well as the rock and groundwater level. Soil permeability assessment is essential to size the absorption bed for the **Ecoflo® Biofilter**.

3.1.2 Absorption area bed

Once the soil and site characteristics have been established, determine the required size of the absorption area bed beneath the **Ecoflo® Biofilter**, using the definitions of soil types in Section 2.5.2 in the Technical Guidelines. The table below provides the minimum area per soil type based on the specified design flows. If the design flow differs from those listed (up to 2200 L/day), the minimum area is the flow rate divided by the hydraulic loading rate permissible by soil type. Example: Minimum bed area for design flow of 1500 L/day in medium to coarse sand would be:

$$\frac{1500 \text{ L/day}}{45 \text{ L/m}^2/\text{day}} = 33 \text{ m}^2$$

The absorption bed consists of a minimum depth of 200 mm (8") of clean crushed stone 15-60 mm Ø (½"-2") in diameter, with a high fraction being 20 mm (¾") in diameter, under the **Ecoflo® Biofilter** (see next paragraph concerning remote location). As shown in figures 1 and 2 below, the absorption bed width and length are proportional to **Ecoflo® Biofilter** dimensions.

The shape of the absorption bed and position of the **Ecoflo® Biofilter** on the crushed stone may vary depending on site constraints. If the absorption bed is located elsewhere than directly beneath the units, an **Ecoflo Biofilter** with collecting bottom (the STB series models) and solid piping (and pumping if needed) shall be used to convey the effluent to the bed. Table 3.1 provides sizing criteria for absorption bed.

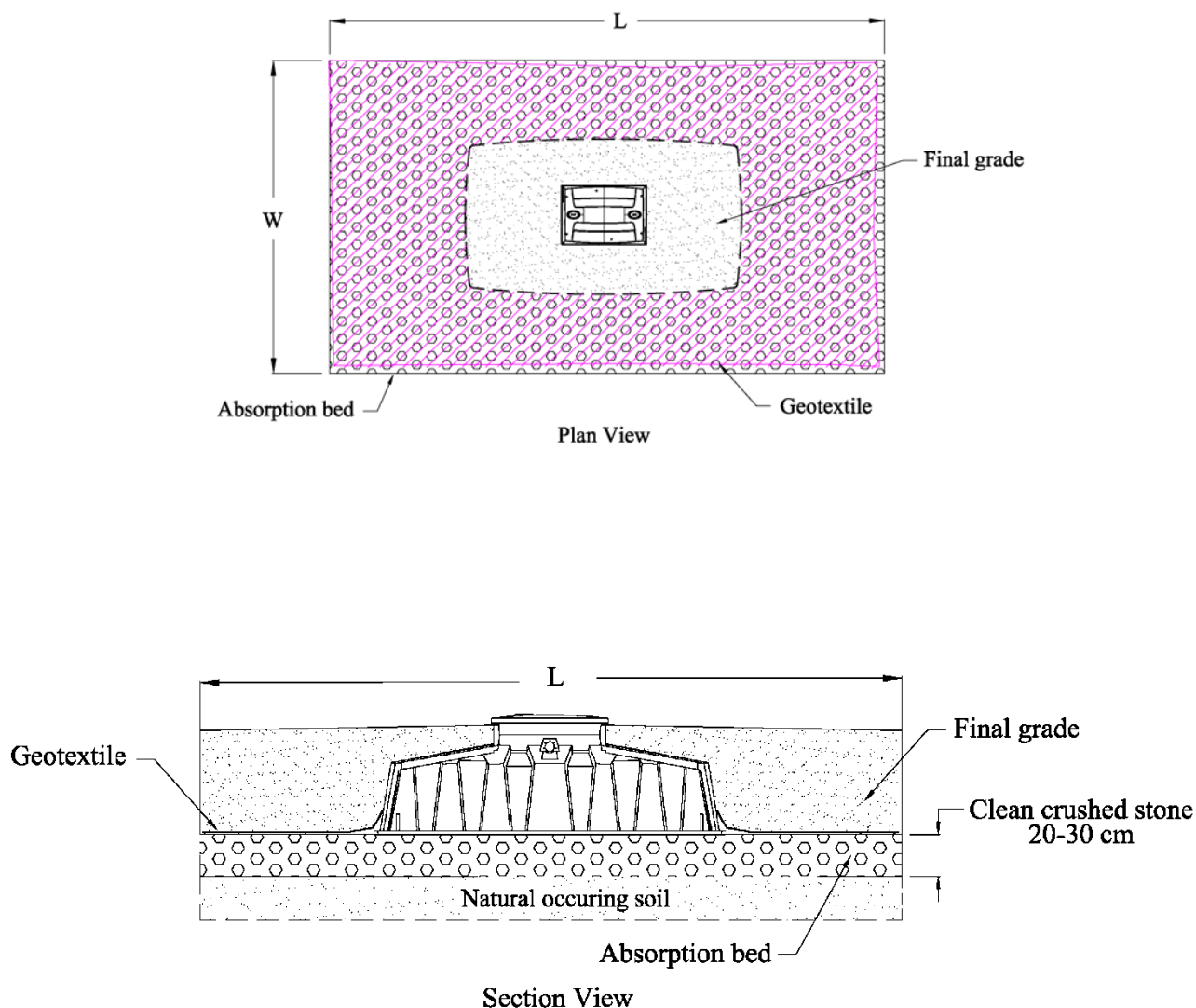
Table 3.1 – Sizing of Absorption Bed

Example Design Flow (L/day)	Number of Ecoflo® Biofilter required ST models					Minimum Area of Absorption Bed, by Soil Type					
						Medium to Coarse Sand	Fine Sandy Gravel	Silty Sand	Sandy Silt	Clayey Silt	Silty Clay
						<i>Hydraulic Loading Rate used (L/m²/day)</i>					
						45	40	32	27	22	15
						m ²	m ²	m ²	m ²	m ²	m ²
500	1	-	1	-	-						
1000	1	-	1	-	-	22	25	31	37	45	67
1200	-	1	1	-	-	27	30	38	44	55	80
1350	-	1	1	-	-	30	34	42	50	61	90
1500	-	1	-	-	-	33	38	47	56	68	100
1700	-	-	-	1	1	38	43	53	63	77	113
2050	2	-	2	-	-	46	51	64	76	93	137
<p align="center">Design notes</p> <p>For larger flows, non-residential sources, and system clustering please consult Appendix F in the NS Technical Guidelines. In any case where an absorption bed exceeds 150 m² an engineering review of potential local water table mounding should be completed. The mounded water table for these systems must be at least 300 mm below the absorption bed.</p>											

If disposal under the unit is not possible effluent can be directed to a disposal field as described in the Technical Guidelines. If the slope on the lot is less than 3% and an area bed or mound are proposed, the loading rates in Table 3.1 are used to determine the size of the field. If the field is a contour (C1, C2, or C3) the required length is calculated following the design procedure found in Chapter 5 of the Technical Guidelines. The length of contour is the same as for septic tank effluent but it is possible to reduce the width of the trench using the loading rates in Table 3.1 to calculate the required bottom area of the trench.

3.1.3 Soil depth required under the absorption bed

There must be at least 600 mm (24") of soil between the base of the absorption bed and the seasonal high water table, bedrock, highly impermeable soil (clay), or highly permeable soil (rock or clean gravel).



3.1.4 Final cover

Shall meet Nova Scotia guidelines.

3.1.5 Mounding analysis

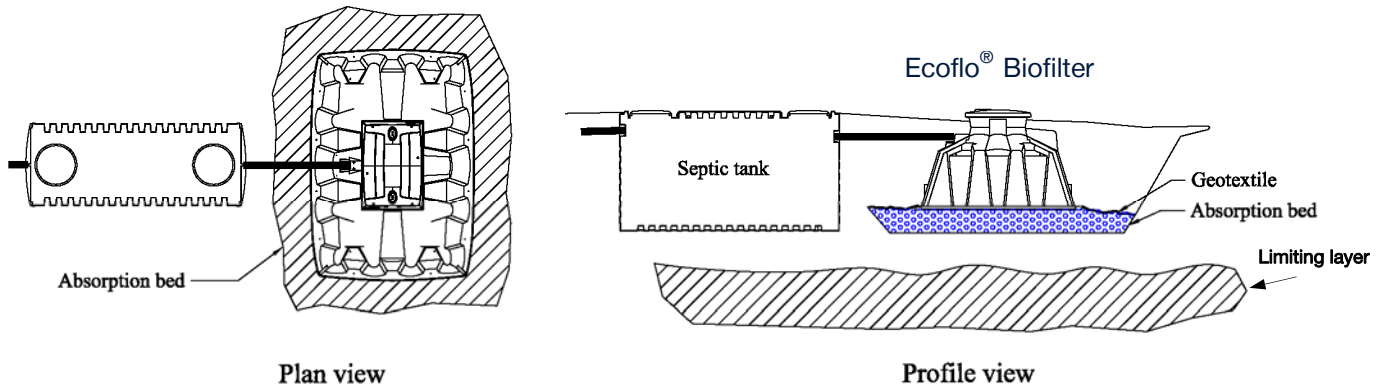
When mounding may be a concern the designers should make themselves aware of the theories involved and include consideration for mounding in the calculations of system size and shape. The best way to limit or avoid mounding concerns is to keep the disposal field long and narrow with the long dimension following the site contour.

4. Typical installations

Type of installation varies according to site conditions. Here are different types of installations:

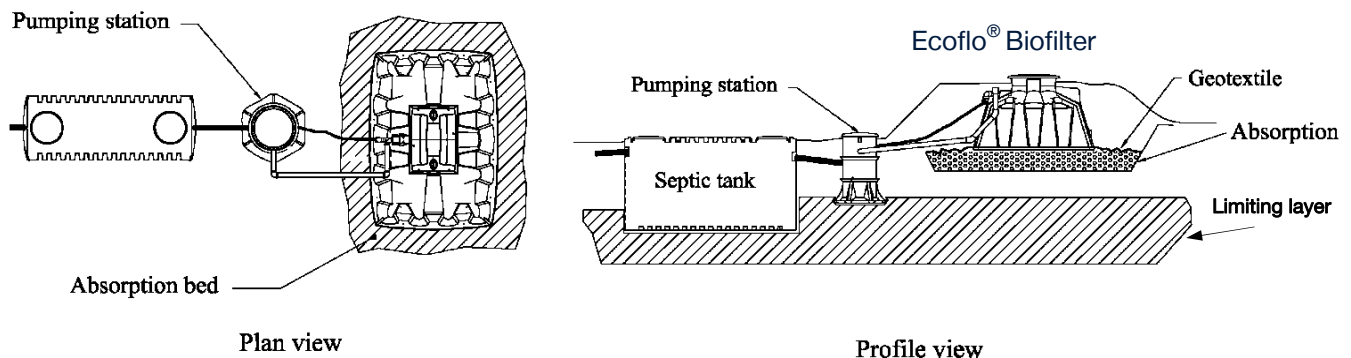
In all cases, the area and depth of the absorption bed and soil depth under the absorption bed, must comply with Part II A Section 3.1 of this document.

Type 1 Installation on flat ground with gravity flow



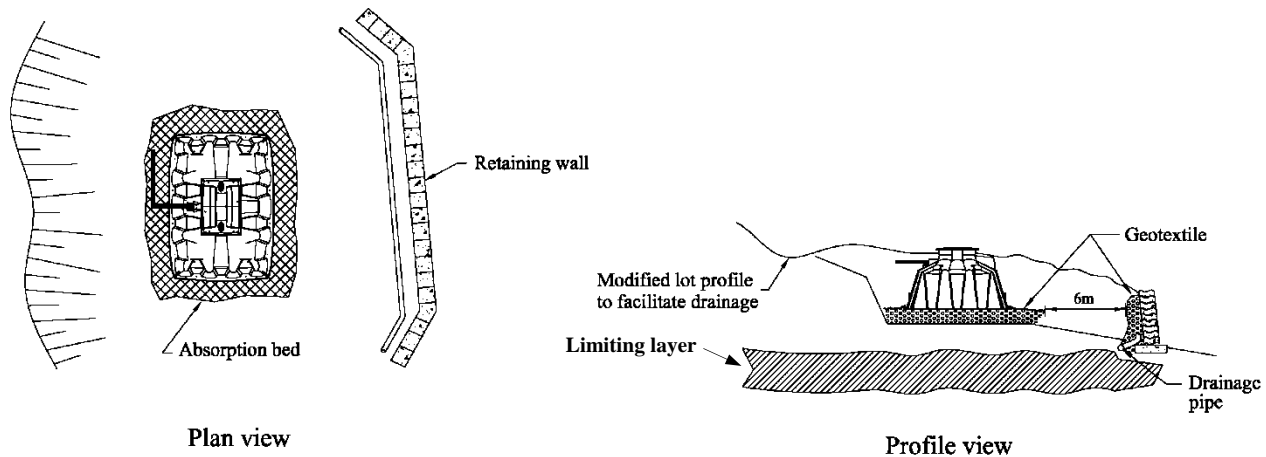
Type 2 Aboveground installation on a flat site

- For installations with a pumping station, the amount of water released to each **Ecoflo® Biofilter** should not exceed 30 to 40 L (6.6 to 8.8 imp. gal.) per dosing. See Part II A Section 1.5 of this document concerning pumping configuration.
- To ensure air circulation, the pumping station must be linked to the **Ecoflo® Biofilter** by an airflow duct.
- The pumping station must be watertight.
- The pumping station must be accessible at all times.



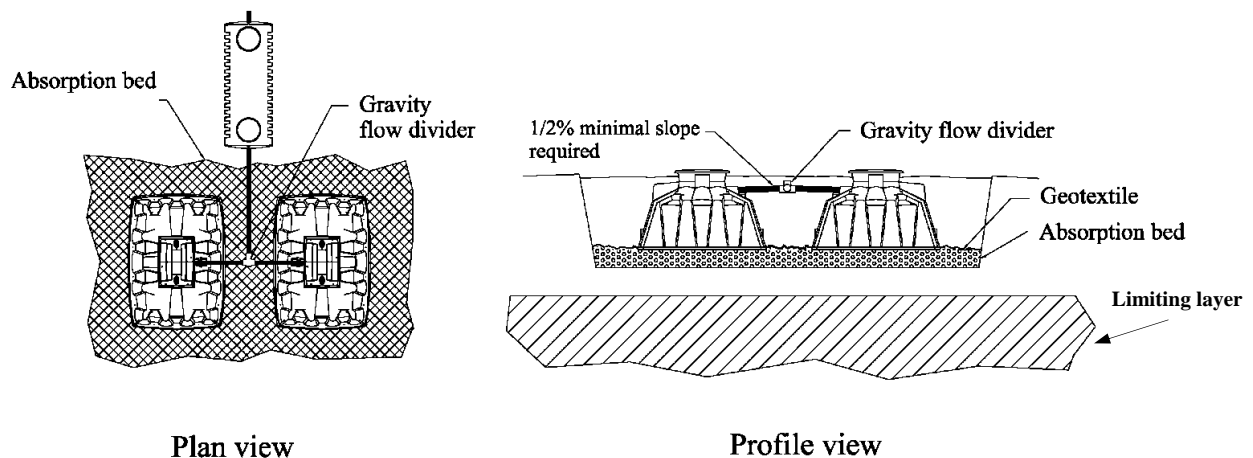
Type 3 Surface installation on a sloped site

- On sloped sites, the shell should be placed at right angle to the slope.
- The profile of the lot should be such that surface runoff flows away from the **Ecoflo® Biofilter** and absorption bed. If necessary, the profile should be modified.
- To account for water released into the soil by the **Ecoflo® Biofilter**, the base of the retaining wall must be well drained to ensure that the soil and septic system remain stable.
- If there is no retaining wall, the backfill material and method used must ensure that the backfill remains stable and does not slide and displace the **Ecoflo® Biofilter**.
- Final cover shall meet Nova Scotia guidelines



Type 4 Installation with two Ecoflo® Biofilters fed by gravity

Installation comprising two **Ecoflo® Biofilters** fed by gravity requires a flow divider. **Premier Tech Aqua** offers two gravity flow divider models: the **GFD-200 gravity flow divider** and the **GFD-200A adjustable gravity flow divider**.



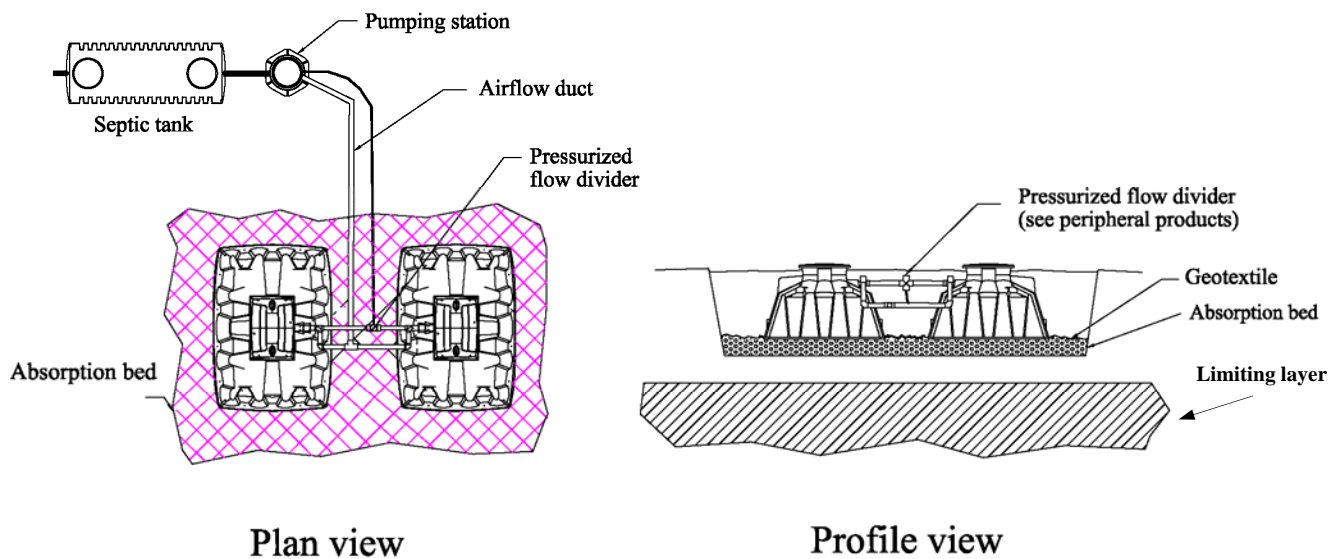
Type 5 Installation with two or three Ecoflo® Biofilters fed by a pumping station

Installation with two or three Ecoflo® Biofilters that can not be fed by gravity requires a **PSA-240L Pumping Station** and **PFS-200/300 pressurized flow dividers**.

PTA offers several pressurized flow divider models. The schematic diagrams below show an installation using the **PFS-200 Pressurized Flow Divider**.

Flow dividers are also available for onsite installations with multiple systems of up to ten Ecoflo® Biofilters.

Important: the amount of water released to each Ecoflo® Biofilter must not exceed 30 to 40 L (6.6 to 8.8 imp. gal.) per dosing. See Part II A Section 1.5 of this document concerning pumping configuration.



PART II B - Ecoflo® Biofilters with collecting bottom

Approved Design Manual and Installation Guide – Nova Scotia

*This document contains the information required to plan and design the installation of the **Ecoflo® Biofilters – Close Bottom** in the Province of Nova Scotia. The design must be made by a Qualified Person Level1. The installation must be performed by an on-site sewage system installer who is certified in Nova Scotia AND who has been trained and accepted by PTA. You can get a list of currently certified and accepted installers by contacting our customer service at 1 800 6-ECOFLO (1 800 632-6356).*

B) Installation procedure for the Ecoflo® Biofilter with COLLECTING BOTTOM - STB Series Models

1. System components description
2. Components location and special instructions
3. Determination of the effluent disposal method
4. Functions of the Ecoflo® Biofilter
5. Typical installations



1. System components description

1.1 Septic tank

The requirements for septic tanks are as stated in Part II A in this document.

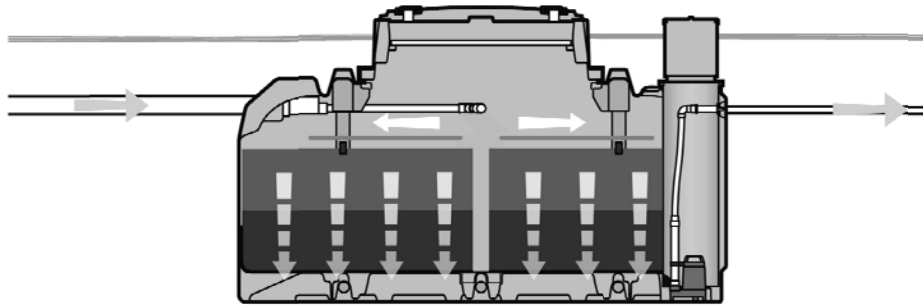
1.2 Premier Tech Aqua's Effluent filter EFT-080 or Polylok PL-122

The requirements for an effluent filter is as stated in Part II A in this document.

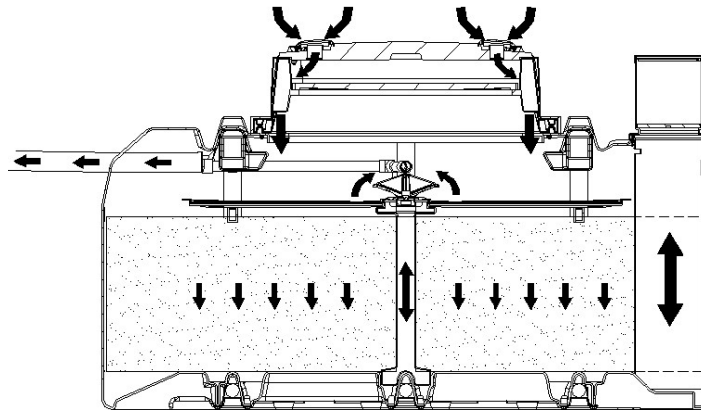
1.3 Ecoflo® Biofilter STB-500/650 with submersible collecting bottom

The **Ecoflo® Biofilter STB-500/650** is a biofiltration system approved for use in Nova Scotia for the treatment of wastewater. It is always installed following a septic tank equipped with an effluent filter. The model and number of Biofilter units required is determined as stated in Part II A Table 3.1 of this document.

1.4 General function of the system



Water flow diagram



Air flow diagram

The Ecoflo® Biofilter is designed to treat domestic wastewater after a primary treatment. This function is performed as the wastewater percolates through the peat based filtering media. It is absorbed briefly where beneficial aerobic microorganisms and fungus degrade the waste constituents and produce highly treated effluent.

To be treated, the wastewater goes first into the septic tank where it is submitted to a primary treatment and then it flows to the Ecoflo® Biofilter. The water is directed into an internal tipping bucket where effluent is dosed equally in one gallon increments onto the peat medium by specially designed distribution plates. The distribution plates are located on both sides of the central support. These plates include channels and orifices to distribute the effluent evenly on top of the filtering media. After, wastewater trickles down into the filtering media where its organic content is consumed by fixed bacteria before entering the absorption bed located underneath the Biofilter.

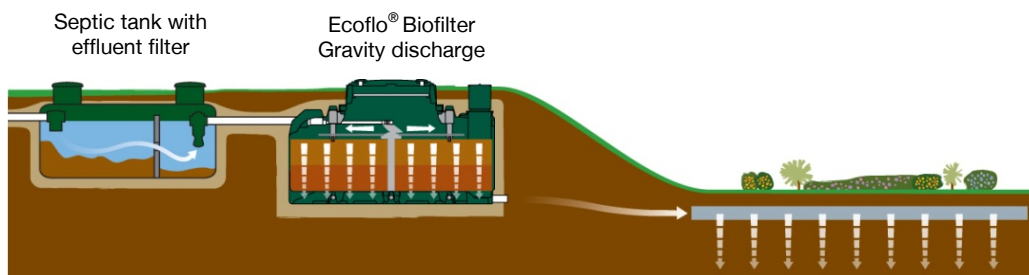
To be efficient, the system requires enough oxygen transfer for the bacteria to do their work. The aeration of the system is based on a gravity air flow as illustrated on the diagram above. The air intake is located on the lid of the biofilter and an independent vent assures the air flow through the system. Air comes into the system by the intake located on the lid. Then, it goes to the extremities of the filter bed via the shell's airflow ducts and circulates at the top of the filtering media underneath the distribution plates. It penetrates then into the filtering media via water infiltration. Also, a gas exchange occurs at the top and at the base of the filtering media promoting its oxygenation. The air coming out of the filtering media is evacuated by passing through the opening located at the top of the central support. Finally, it is conducted by convection to the home air vent via the septic tank.

1.5 Pumping station (when Applicable)

The Ecoflo® typically does not require a pump, but receives gravity-fed effluent from the septic tank. If the system requires a pumping station, a **PSA-240L Pumping Station** (or an approved product - in either case the standard requirements of the Technical Guidelines for pump chamber capacity shall be met) should be installed downstream of the septic tank and/or the effluent filter container, unless site conditions do not permit this configuration (see *PSA-240L Installation Guide* for information on its function and installation). Where it is necessary to pump to the septic tank, the additional standard requirements of the Technical Guidelines concerning septic tank type and size, discharge per pump cycle, discharge rate, and flow control must be observed. Like the septic tank, the pumping station must also be watertight to prevent groundwater infiltration. The amount of water released to each Ecoflo® Biofilter must be within 30 to 40 L (6.6 to 8.8 imp. gal.) per dosing.

2. Components location and special instructions

Components of a residential gravity flow septic installation



2.1 Minimum Clearance Distances Prescribed by Regulation

See Table 2.5 (A) of the Technical Guidelines for horizontal clearance distances applicable to all on-site sewage disposal systems in Nova Scotia, including PTA units. In addition, no trees are to be located within 2 m (6.5 ft) of the absorption bed (if applicable), and, no motorized traffic or heavy loading is to be located within 3 m of the lid of the unit.

The use of the term “absorption bed” in this document has the same meaning as “disposal field” in the Technical Guidelines for the purpose of determining minimum clearance distances.

2.2 Installation conditions

Contact the septic tank manufacturer to see if they recommend a maximum installation depth. The septic tank must be watertight and receive only household wastewater in accordance with the Technical Guidelines.

Depending on the situation, an interceptor trench may be installed up slope/around the septic tank to prevent groundwater infiltration.

The **Ecoflo® Biofilter** must be installed in a place:

- where the area around the unit (and around the absorption bed, if any), has positive surface water drainage away from the unit and the bed;
- that is not subject to flooding or groundwater rise, such that maximum level of the groundwater table rises over the shoulder of the **Ecoflo® Biofilter**, which means 1245 mm (49") from the base of the shell. If there is a possibility that the groundwater may rise higher than that, drainage by means of ditching or subdrains is required around the Biofilter to prevent it;
- where it is accessible for pumping and maintenance.

3. Determination of the effluent disposal method

IMPORTANT! THIS STEP IS A CRUCIAL ELEMENT FOR ANY SEPTIC INSTALLATION

Disposal methods

The effluent of the **Ecoflo® Biofilter with collecting bottom** can be discharged by gravity flow or via a pumping station (if needed) that brings the effluent to an absorption bed. If a pump is used, the **pumping station PSA-240L** that has been specially designed for this application can be used in conjunction with the Ecoflo models with a fibreglass shell. Note that the Ecoflo models with a concrete shell have an integrated pump vault thus the use of an external pumping station is not required.

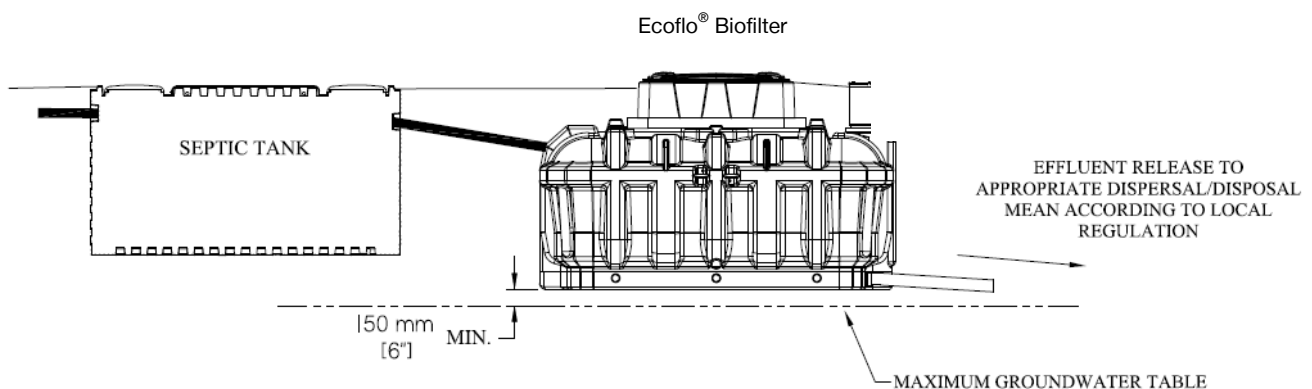
3.1 Discharge to an absorption bed (when applicable)

The requirements for absorption beds are as stated in Part II A section 3 of this document. The absorption bed is to be entirely covered on top by geotextile. All piping within the absorption bed shall be installed in accordance with the Nova Scotia Technical Guidelines.

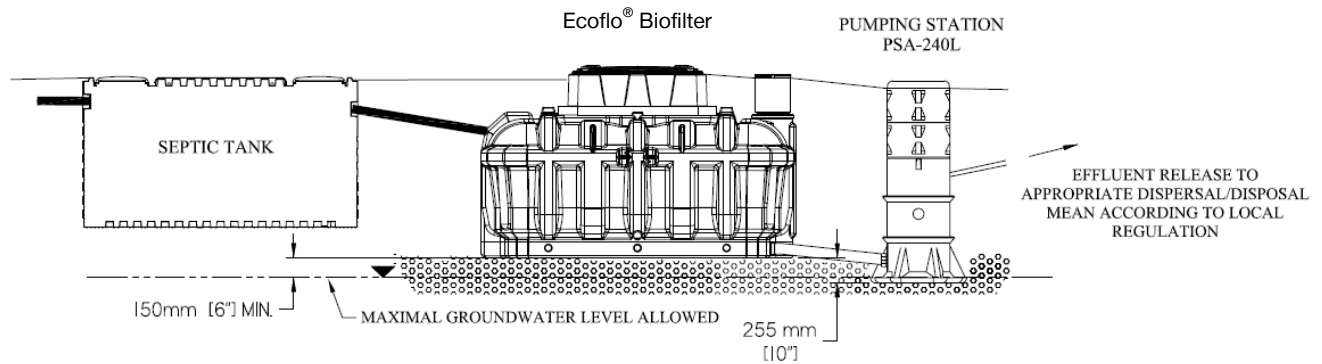
4. Typical installations

The type of installation depends on site conditions and the Technical Guidelines. Below are some examples. The Ecoflo® shell could be either in fibreglass or in concrete. Note that the Ecoflo models with a concrete shell have an integrated pump vault thus the use of an external pumping station is not required.

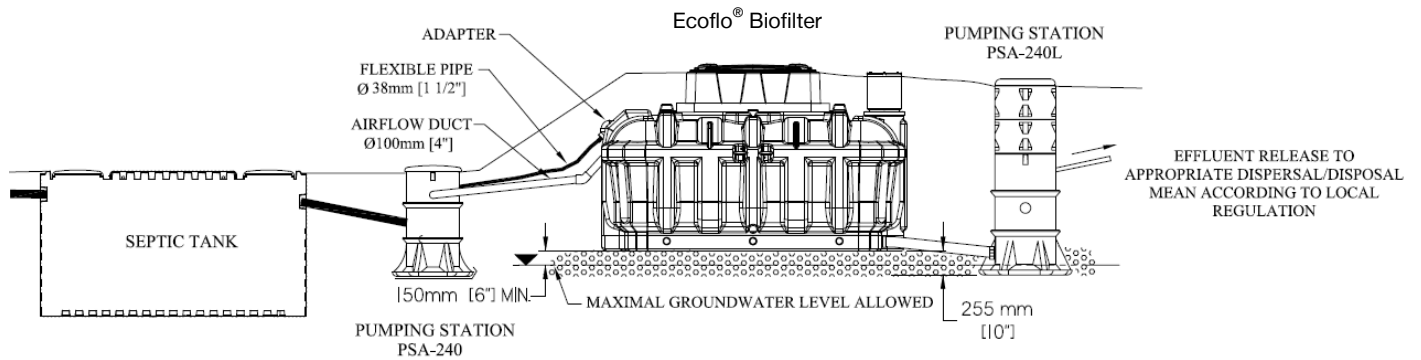
Type 1 Gravity flow installation with effluent release to absorption bed



Type 2 Gravity flow installation with effluent release to a pumping station



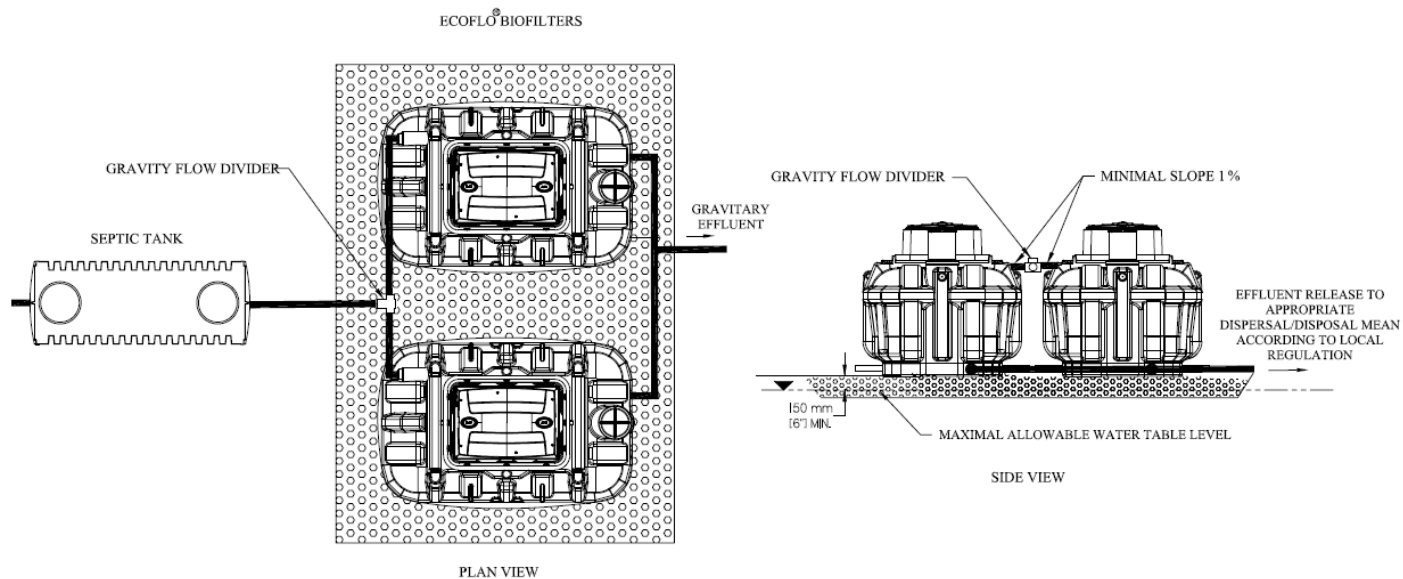
Type 3 Partially above-ground installation with effluent pumped up to an absorption bed



Type 4 Gravity flow installation with two Ecoflo® Biofilters

Onsite systems comprising two Ecoflo® Biofilters require a flow divider. Premier Tech Aqua offers two gravity flow divider models:

- the GFD-200 gravity flow divider and
- the GFD-200A adjustable gravity flow divider.



Part III - Ecoflo® Biofilter Assembly and Installation Guide

Approved Design Manual and Installation Guide – Nova Scotia

A) Ecoflo® Biofilter with Open Bottom – ST Series Models

Please refer to section B for information on the polyethylene open bottom models.

1. Ecoflo® Biofilter functions

1.1 System components functions

Lid

- Gives access inside the shell;
- Feeds with air the filtering media (via its intake);
- Securely fastened with bolted assemblies.

Insulating board

- Give a thermal insulation to the system;
- Helps guiding airflow into the shell's air ducts;
- Seals the system (with Premier Tech ty-raps);
- Constitute an added security against frost.

Shell (including optional riser, if any)

- Encloses the system components;
- Holds air and water pipes connections to the system;
- Circulates air via its air ducts to the ends of the filtering media.

Central support

- Support the tipping bucket and one end of the distribution plates;
- Allow air exchange between bottom and top of filtering media;
- Its access allows inspection of the absorption

Tipping bucket

- Allows even distribution of the influent on both sides of the filtering media;
- Creates hydraulic events required to obtain a good water distribution on the distribution plates and contribute to their self-cleaning.

Distribution plates

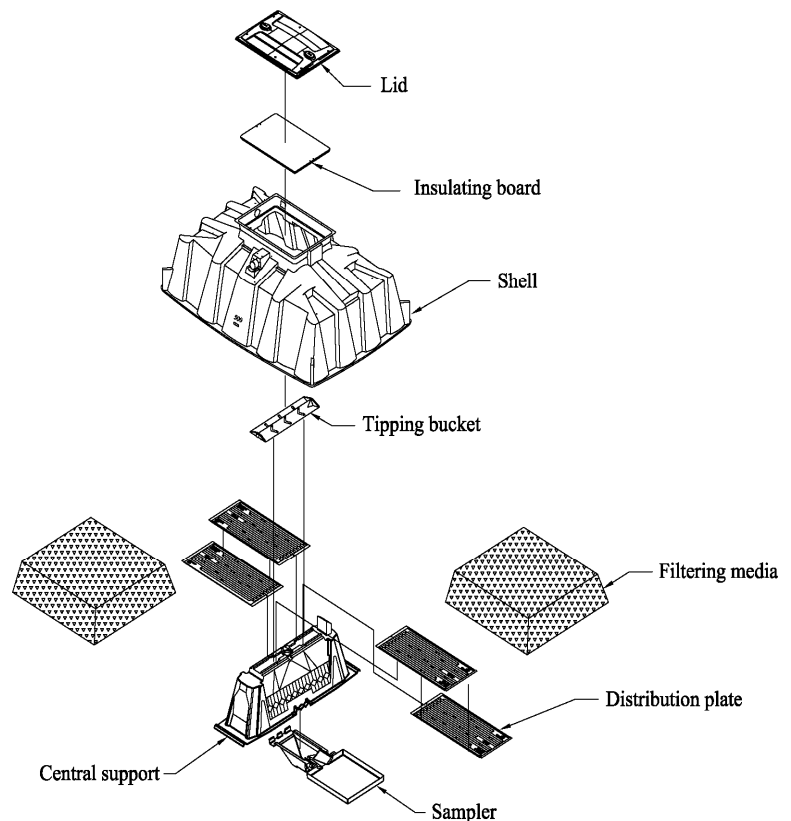
- Allow even distribution of the influent over the filtering media.

Filtering media

- Acts as a support for bacteria that consume the wastewater organic content;
- Does a physical filtration of the influent solids content;
- Keeps an adequate humidity level required for biomass viability when there is no incoming water.

Sampling device

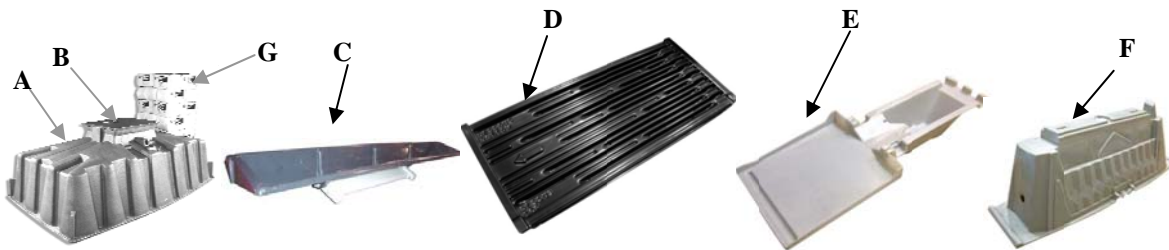
- Allows taking representative samples of the effluent treated by the system.



2. Installation sequence

2.1 Make sure that you have all the following components or articles

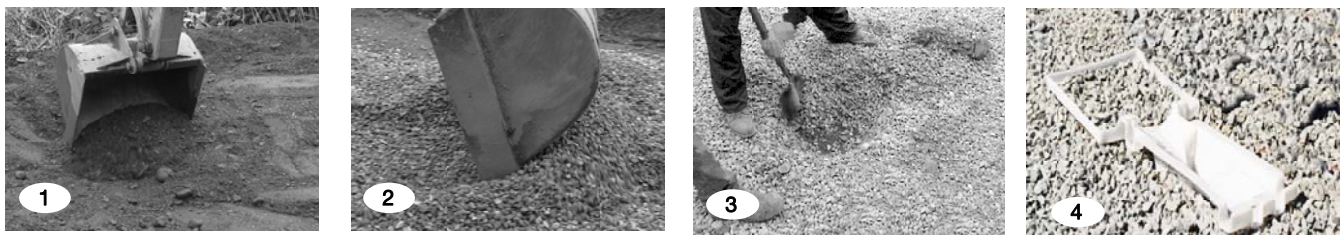
- A. 1 shell including :
 - 1 bag with the owner's documentation
 - 4 black plastic ty-raps, 2 ty-raps marked Premier Tech
 - 1 insulating board
- B. 1 lid
- C. 1 tipping-bucket
- D. 4 distribution plates
- E. 1 sampler
- F. 1 central support
- G. 1 pallet of filtering media



For any problem, faulty or missing part,
contact our customer service at 1 800 632-6356.

NOTE: The installer is responsible to take the precautionary measures of safety applying to all installation steps, including wearing a hard hat, gloves, boots, glasses, mask, etc.

2.2 Absorption bed, sampling device and central support



Prepare the absorption bed in accordance with the sizes prescribed in *Part II section 3.1.2* of this document (1).

- Clean crushed stone 15-60 mm Ø (1/2-2"), with a high fraction of a diameter of 20 mm (3/4") (2);
- Minimum thickness of the bed is 200 mm (8") (3).

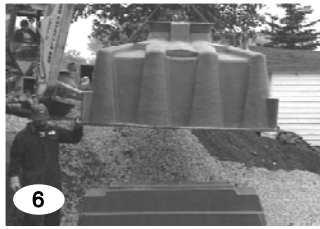
After that, place **the sampling device on the crushed stone bed with its flat part on the right side of the supply line** (when we look at the absorption bed from the septic tank) (4).

2.3 Setting the shell in and levelling



5

The sampler's receptacle must be located in the center and under the central support. Level the central support and make sure that it is in full contact with the surface of the crushed stone.



6

Place the shell on the central support. Take note that the central support must be embedded in the shell. **The central support funnel must be located opposite the water inlet.**



7

Double check to make sure the shell and central support are both levelled and in full contact with the surface of the clean crushed stone.

2.4 Geotextile installation and Ecoflo® Biofilter backfill



8

Place a **geotextile** (polymeric membrane permeable to air and water) on top of the crushed stone **around the shell only** so as to protect the stone from contamination or obstruction from objects or particles.

There should be no geotextile under the Ecoflo® Biofilter. The backfill material should be clean fill ranging in particle size from 0.2 – 2.0 mm and contain no organic matter, impervious soil, stones, rocks, debris or other objects that could damage the shell.

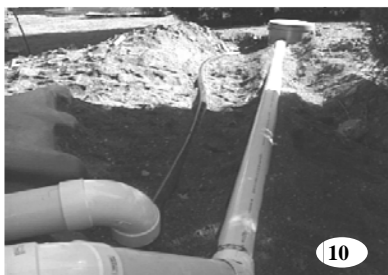


9

Warning! When backfilling the **Ecoflo® Biofilter**, start by stabilizing the shell by carefully backfilling the four corners.

After, backfill the two long sides, followed by the two ends. It is important that the backfill material be deposited, not dumped. Using a bulldozer for this step is not recommended.

2.5 Supply line connection



10

All pipe connections to a treatment unit must be watertight and flexible. Connect the supply line to the **Ecoflo® Biofilter**, ensuring a steady downward slope of at least 2 % toward the **Biofilter**.

It is important that the soil underneath the pipe be well compacted.

2.6 Supply line connection to the flexible adapter*

Assembly steps

1. Loosen the clamp without removing it from the adapter;
2. Clean the supply pipe end and apply a PVC primer;
3. Apply PVC cement inside the adapter and on the supply pipe end;
4. Insert the pipe covered with cement all the way inside the adapter;
5. Tighten back the clamp on the adapter and the supply pipe.

* The same procedure is applicable to the vent pipe connection when a pumping station is used.

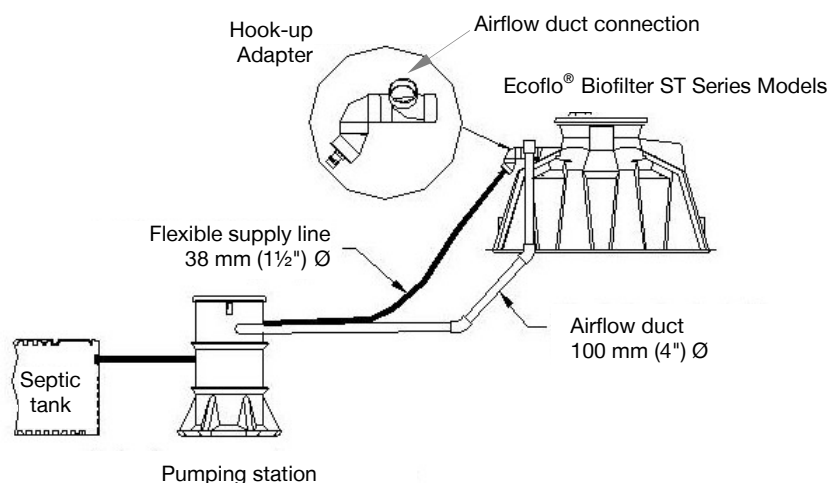


Pipe installation details when a pumping station is required to feed the Ecoflo® Biofilter ST Series Models

When the use of a pumping station is required upstream of an **Ecoflo® Biofilter ST-500/650**, the following instructions must be taken into account:

- The pumping station must be accessible at all times.
- For installations with a pumping station, the amount of water released to each **Ecoflo® Biofilter** must be within 30 to 40 L (6.6 to 8.8 imp. gal.) per dosing. See Part I Section 1.5 of this document concerning pumping configuration.
- The pumping station must be watertight to infiltration and exfiltration.
- The supply line (flexible pipe of 38 mm Ø (1.5")) uses an **adapter** to allow connection to the **Ecoflo® Biofilter** inlet which has a diameter of 100 mm Ø (4"). **Take note that the use of the adapter is mandatory to break the jet stream coming from the pumping station.**
- An airflow duct must link the pumping station and the **Ecoflo® Biofilter** to ensure air circulation. The airflow duct is connected to the adapter located at the Biofilter's inlet, as illustrated below.

To facilitate the understanding of these instructions, refer to the diagram below, or to the **pumping station PSA-240L** Installation Guide, as example.



Pipe installation in systems with a pumping

2.7 Final backfill and filtering media installation



Add final backfill and cover with topsoil.

The lid must be 50 mm (2") aboveground once the final landscaping has been completed.



Fill the Biofilter with the filtering media.



Level the surface of the filtering media with a rake. The top of the filtering media should be just below the distribution plates.

Attention! Avoid compacting the filtering media (do not step on it). It is possible to have leftover filtering media after completion.

2.8 Setting the distribution plates



Install the distribution plates by sliding them onto the brackets located at both ends of the shell (14-16).

- Place the first plate on the left side, followed by a second plate on the right side, fitting it onto the edge of the first plate.
- Follow this same procedure for the other side of the shell (two plates on each side).

The distribution plates should rest on top of the central support and be attached to it using the four black plastic ty-raps provided for this purpose (17).

2.9 Tipping-bucket installation



Once the distribution plates are securely in place (17), fix the tipping-bucket on the central support by inserting its locking catches in the central support anchors (18/19). Verify that the tipping-bucket installation has been done properly by tipping it from left to right to make sure nothing is blocking it (20).

2.10 System operation verification and warranty seals



After making sure the distribution system operates properly, close the **Ecoflo® Biofilter** by installing first the insulating board and then the lid (21). Seal it shut by attaching the handle of the insulating board to the access of the **Ecoflo® Biofilter** using the two plastic ty-raps marked "Premier Tech Aqua" (22).

Don't forget the inspections required by the Nova Scotia Regulations.

Check points following installation:

- ☐ Never cover or bury the lid;
- ☐ Never install the absorption bed of an **Ecoflo® Biofilter** within 2 m (6.5') of a tree;
- ☐ Never enter the biofilter after installation without prior written authorization;
- ☐ Never drive vehicles or place objects weighing over 225 kg (500 lbs) within 3 m (10') of the lid, and make sure you advise those involved so they don't damage your septic system (landscaper, snow blower);
- ☐ Do not shovel or blow snow so it accumulates on top of the septic system. The overload could cause damage;
- ☐ For an installation with a pumping station located upstream of the **Ecoflo® Biofilter**, the airflow duct must be connected from the pumping station to the **Ecoflo® Biofilter**.
- ☐ Homes must be equipped with an air vent that is in proper working order and complies with the applicable standards; **PTA** recommends the use of a 100 mm (4") Ø pipe;
- ☐ Give the owner the plastic bag containing the Owner's Manual and the Maintenance Agreement;
- ☐ Tell the customer to fill out and sign the Maintenance Agreement. He must keep the white copy, send the yellow copy to the authorized distributor and the pink copy to Premier Tech Aqua.

**For any problem, question or comment, do not hesitate to contact
our customer service at 1 800 632-6356**

3. Shipping and handling instructions

3.1 Shipping from the dealer to the installation site

- Use a vehicle with loading space large enough for the **Ecoflo® Biofilter** to fit in completely.
- Secure the Biofilter to the vehicle with appropriate straps.
- The carrier is responsible for any damages and for observance of traffic regulations.
- As much as possible, use the anchor rings to load the Biofilter onto the vehicle.

3.2 Handling

- Handle with care to avoid damages.
- Use the anchor rings to unload the Biofilter (especially for assembled Biofilter). Make sure that the forks used are long enough to reach completely across the Biofilter.
- The material handler is responsible for any damages that may occur.

3.3 Loading configuration

- The loading configuration depends on the type of vehicle used to transport the Biofilter(s) to the installation site.
- The loading area must be at least 4.2 m x 2.4 m for the **Ecoflo® Biofilter** to fit inside completely.
- The carrier must keep enough space to carry the filtering media bags (bags can be taken off the pallet). A pallet of filtering media measures about 1.4 m x 1.1 m.

B) Ecoflo® Biofilter with Collecting Bottom – Polyethylene Shell

1. Polyethylene Ecoflo® Biofilter Component Description

PLEASE CONSULT THE ILLUSTRATION ON FOLLOWING PAGE

Lids

- Access port for maintenance and inspection – main and secondary access;
- Air intake from the main lid provides proper air flow through the system;
- Secure both openings with bolted assemblies.

Insulating boards

- Thermally insulate the system;
- Guides airflow into the shell's air ducts (main access);
- Seals the system (main access).

Shell

- Encloses the system's components;
- Allows connection of water and air pipes;
- Collects the treated effluent (STB models).

Central support

- Supports the tipping bucket and one end of the distribution plates;
- Allows air circulation between bottom and top of the filtering media.

Support rails

- Support the other end of the distribution plates.

Tipping bucket

- Evenly distributes the wastewater on both sides of the filtering media;
- Creates hydraulic events required for proper distribution of the wastewater on the distribution plates and, at the same time, contributes to the self-cleaning of the plates.

Distribution plates

- Allow even distribution of the influent on the surface of the filtering media.

Filtering media

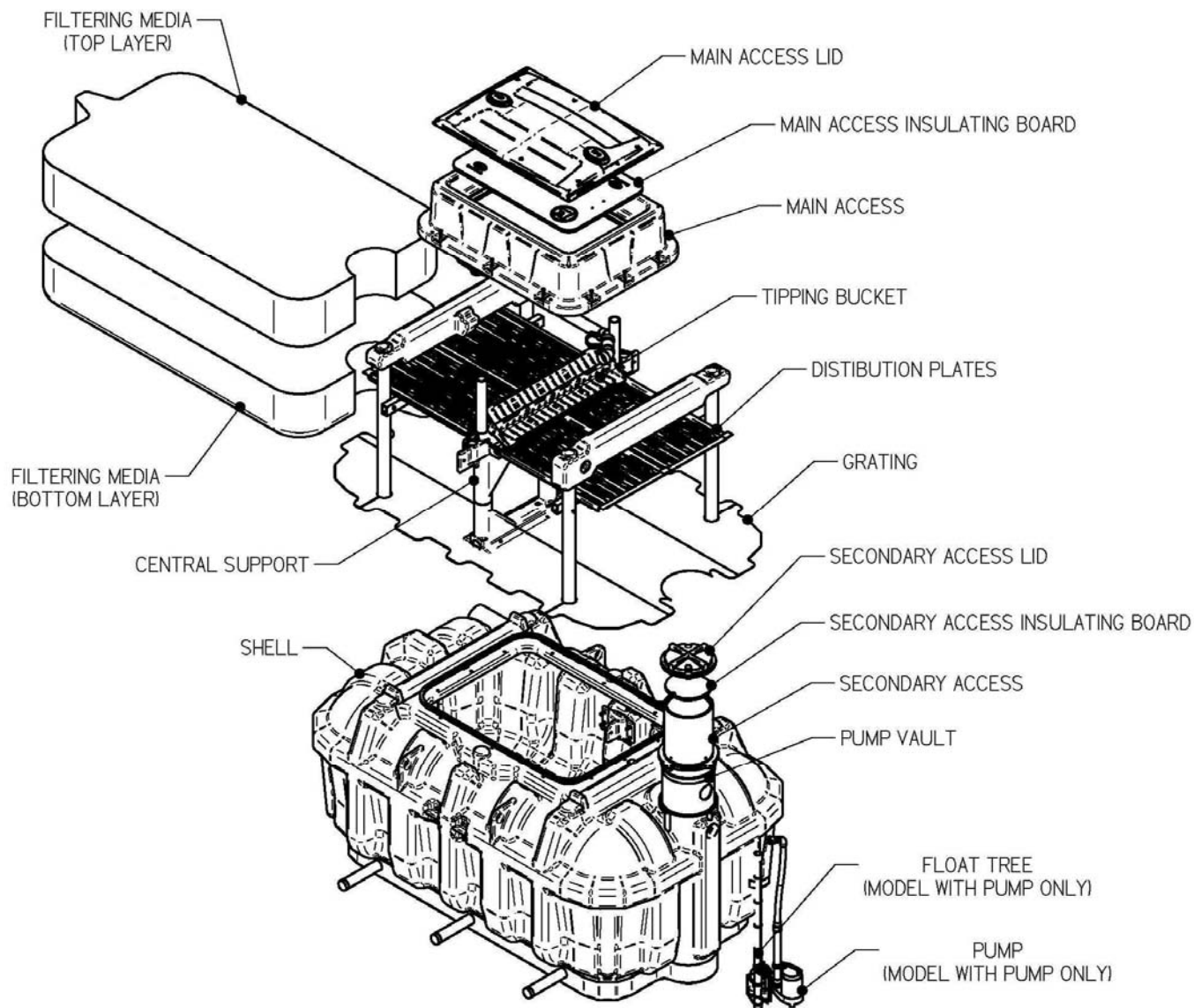
- Consists of a natural fibre-based filtering media;
- Promotes good biomass growth which is essential to biological treatment of the wastewater;
- Physically filters the solids contained in the influent;
- Maintains adequate humidity level required for biomass viability when there is no water going through the system for a certain amount of time.

Treated effluent collection area

- Allows proper drainage of the treated effluent;
- Allows air to circulate under the filtering media.

Pump vault / secondary access (if applicable)

- Allows air circulation between bottom and top of the filtering media;
- Allows access to the base of the system to collect a sample of the treated effluent;
- Encloses the following pumping equipment: pump, On/Off float and alarm float (models with integrated pump);
- Allows treated effluent to be sent towards the available disposal method (models with integrated pump).



Exploded view of the Polyethylene Ecoflo® Biofilter

**If you have a problem, or a part is defective or missing, do not hesitate
To contact our customer service department at 1 800 632-6356.**

2. Installation Sequence

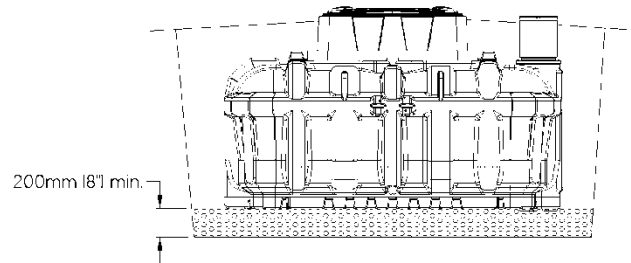
NOTE: The installer is responsible for the implementation of safety measures throughout the installation (i.e. wearing a hard hat, gloves, boots, safety glasses, a mask, etc).

2.1a Excavation, bedding and placing of the perforated bottom Ecoflo® Biofilter (ST models)

- Excavate and prepare the absorption bed according to the standards specified in the applicable Design Guide.
 - Use clean 15 to 60 mm (½" to 2") diameter gravel. It is highly recommended to use a 20 mm (¾") diameter clean crushed stone.
 - Minimum thickness of the bed: 200 mm (8").

NOTE:

- Never install the absorption bed of the Ecoflo® Biofilter within 2 m (6,5') of a tree.
- There are no risers available for polyethylene Ecoflo® Biofilter models**, this is important to take into consideration when determining the absorption bed's depth.



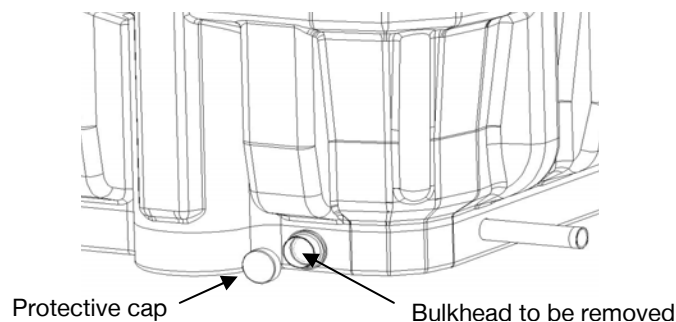
Center the shell onto the absorption bed area. Make sure the shell is levelled and rests on all points of the previously levelled bed.

Place a geotextile (material permeable to air and water) on top of the crushed stone **around the shell only** to protect the crushed stone from contamination or obstruction by objects or particles. **There should not be any geotextile on the crushed stone under the Ecoflo® Biofilter.**

2.1b Excavation, bedding and placing of the watertight bottom Ecoflo® Biofilter (STB models)

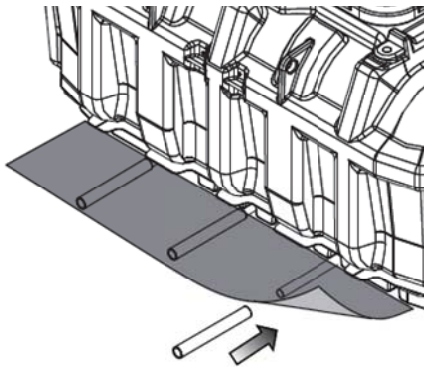
Excavate an area of approximately 3.0 m x 4.5 m (10' x 15'). Depending on soil conditions, it might be necessary to add a layer of 150 mm (6") of either 0 to 20 mm (0 to ¾") diameter gravel void of any plant material or clean 20 mm (¾") diameter gravel surrounded by geotextile (over the excavated area). Place the shell in the center of the excavated area. Check that the height of the installation is adequate. **There are no risers available for polyethylene Ecoflo® Biofilter models.** Make sure the shell is levelled and rests on all points of the previously levelled and compacted bed.

If you are installing a gravity discharge watertight bottom Ecoflo® Biofilter model, before going any further with the installation, connect the effluent discharge pipe using a flexible, watertight outlet adaptor. Remove the protective cap and punch the bulkhead of the outlet adaptor. No debris resulting from that operation must be left in the Ecoflo® Biofilter.



Connect the pipe to the Ecoflo® Biofilter. The pipe must have a constant downward slope until it reaches the disposal area. The soil under the pipes must be properly compacted.

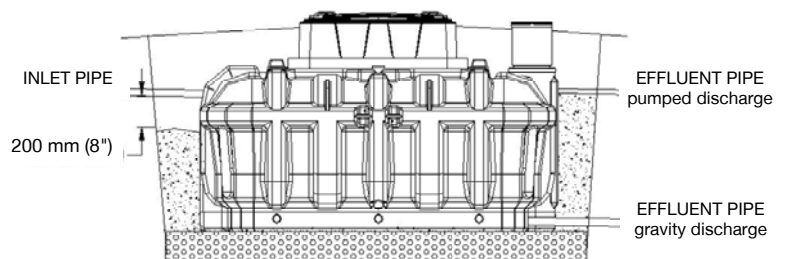
2.2 Extension pipe and membrane installation (STB models)



To ensure a maximum of stability, install the six (6) pipe extensions on the existing pipes assembled on the shell. Lay the membrane on the protruding pipes on both sides of the shell. Spread and level the fill material over and under the membranes.

2.3 Initial backfill of the shell

Place backfill material around the shell up to 200 mm (8") underneath the invert of the inlet pipe. Start with the long sides and finish with the short sides. The backfill material must be placed with care and not dumped (do not compact with bulldozer).

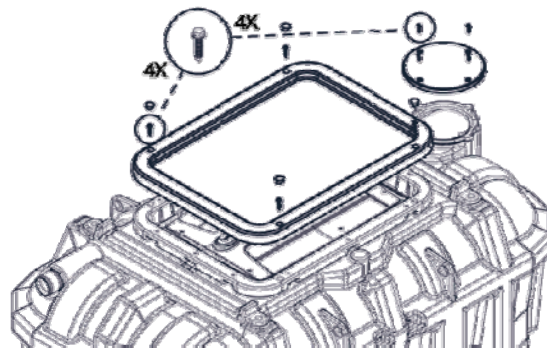


The backfill material must be sandy, with no rocks or stones.

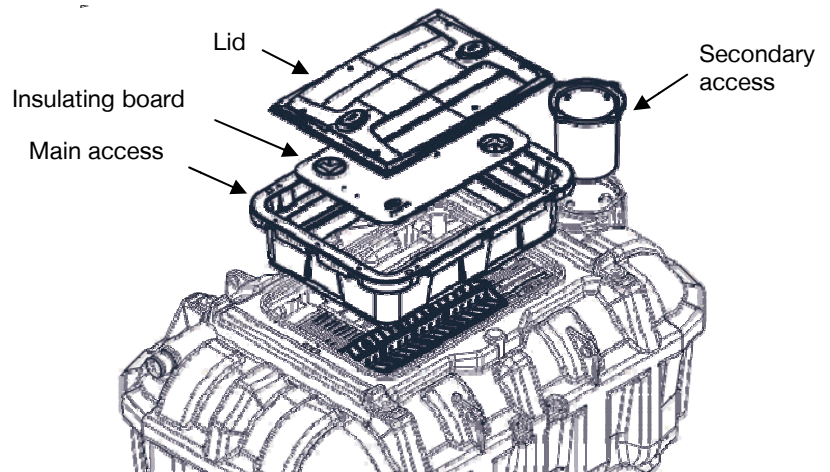
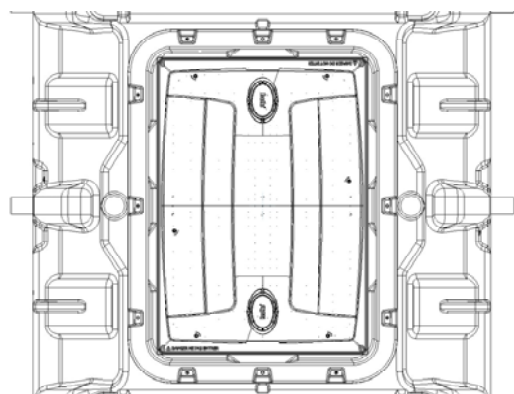
CAUTION: Make sure the backfill material stays out of the shell during the backfill operation.

2.4 On site assembly

- Unscrew and remove the protective shipping material found on the main and secondary access.

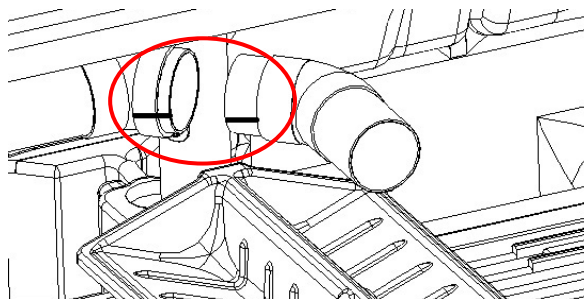


- Remove the main and the secondary access. The main access assembly includes the lid and the insulating board. To remove the lid, unscrew the four lag screws in the four corners of the lid.

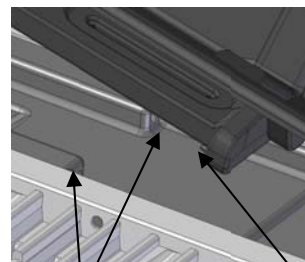
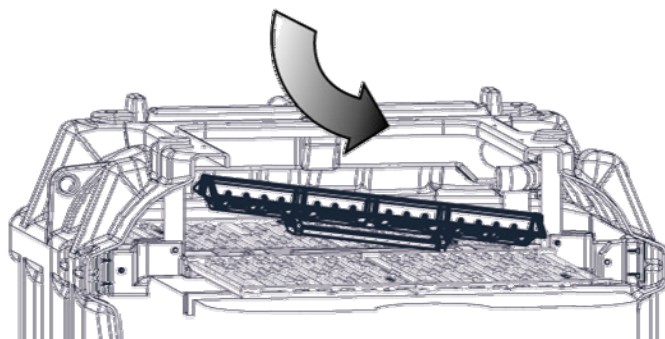


- Glue in place the elbow assembly on the water inlet pipe. Align marks to ensure that the elbow assembly is correctly positioned. Once in place the inlet pipe must be centered with the tipping bucket. The elbow assembly is packaged in the components box. This box is shipped with the biofilter and is located in the main access.

CAUTION: Do not reverse the elbow. The water inlet would then be off center.



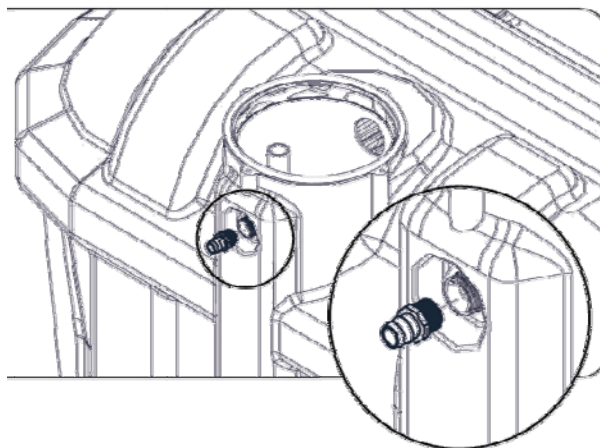
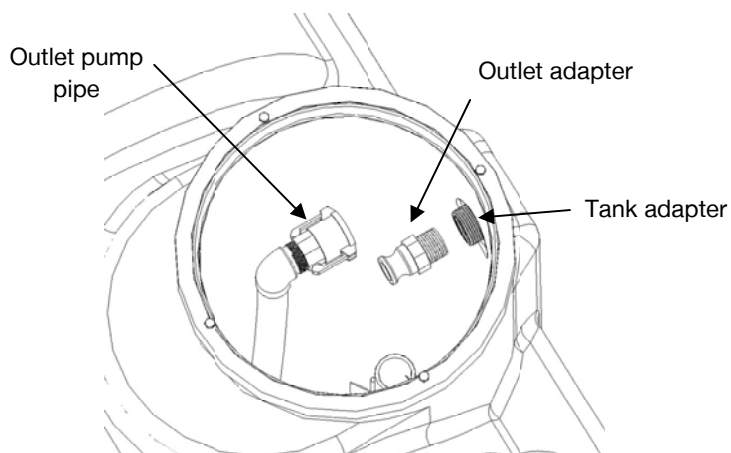
- Attach the tipping bucket to the central support by inserting the two (2) locking catches into the central support's anchor slots. Bring down the opposite end to make sure the tipping bucket stays in place. Check the state of the tipping bucket by moving it from left to right to make sure nothing is blocking its movement.



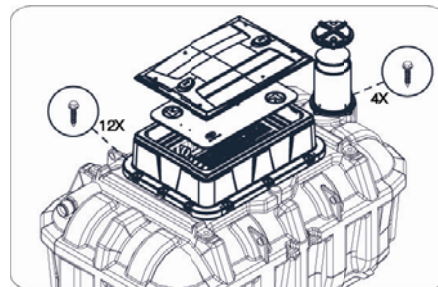
Anchor slots

Locking catch

- **Make sure that:**
 - The distribution plates are properly installed;
 - The float tree and the pump are correctly positioned (models with integrated pump);
 - The tipping bucket tilts correctly on both sides.
- Screw in the pump outlet adapters (models with integrated pump). These adapters can be found in the components box (shipped within the main access of the biofilter).

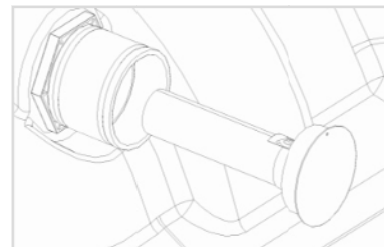


- Screw in place the main and the secondary access with the supplied lag screws and place the insulating boards and lids. Secure the lid of the main access with the four lag screws and the lid of the secondary access with the two quarter turns. The secondary access lid and insulating board are packaged in the components box (shipped within the main access of the biofilter).



2.5 Pipe connections (water intake and pumped discharge)

- Connect the supply line from the septic tank to the water intake of the Ecoflo® Biofilter, making sure that the entire length of the pipe is on a constant downwards slope that slants towards the Ecoflo® Biofilter. Note that the soil under the pipe must be properly compacted. The Ecoflo® Biofilter is equipped with a standard flexible intake adaptor. Use a regular pipe clamp to make the connection. Remove the protective cap before connecting the inlet pipe. Do not discard the documents wrapped under the cap: they must be handed over to the owner.



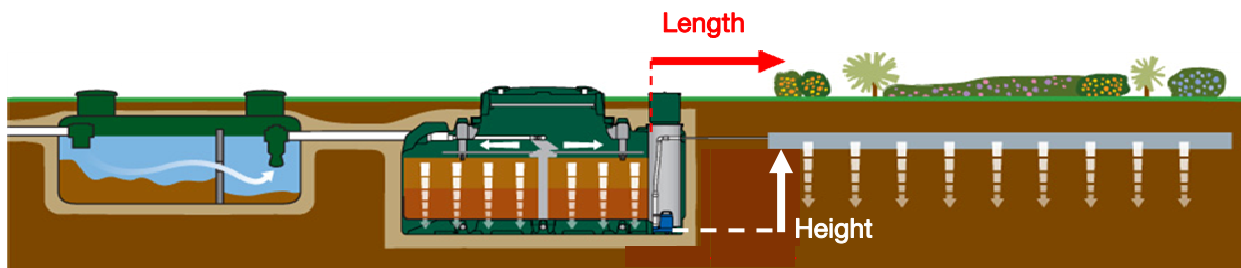
- The effluent pipe from the integrated pump model must be connected to the treated effluent disposal method (absorption disposal, watercourse, etc.) using a flexible 25 mm or 38 mm (1" or 1½") Ø pipe. This pipe must be capable to withstand a minimal pressure of 700 kPa (100 PSI) and must also be compatible with underground applications. A barbed 25 mm (1") Ø coupling (**Item A**) links this flexible pipe to the biofilter's outlet. If necessary, the other end of the pipe is connected to the pipes of the treated effluent disposal method via the coupling supplied for this purpose (**Item B**). Precautionary measures against freezing must be taken if the effluent is discharged into a watercourse. Both items can be found in the components box (shipped within the main access of the biofilter).



What you should know if you use PTA's integrated pump:

- The **maximum length of the pressurized pipe** (flexible pipe) from the pump's outlet, **using a 25 mm (1") Ø pipe**, depends on the head (difference in elevation between the base of the pump and the end of the pressurized pipe). The **maximum length of the pressurized pipe** (flexible pipe) from the pump's outlet, **using a 38 mm (1½") Ø pipe**, is limited by the volume of water that returns to the Ecoflo® Biofilter once the pump has stopped running. The following table presents the different allowable pipe lengths:

Head	7,5 m (25')	6 m (20')	4,5 m (15')	3 m (10')	1,5 m (5')
Maximum length of the Ø 25 mm (1") pipe	---	18 m (60')	21 m (70')	24 m (80')	27 m (90')
Maximum length of the Ø 38 mm (1½") pipe	30 m (100')	30 m (100')	30 m (100')	30 m (100')	30 m (100')



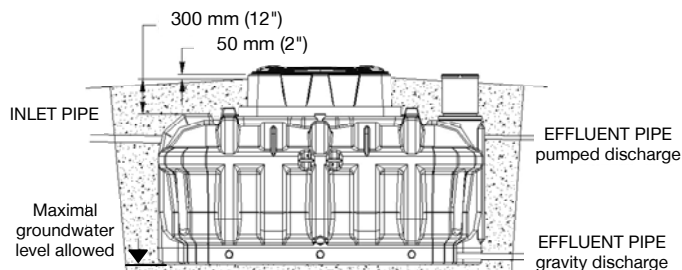
NOTE: The pipes must be installed in a way that they can drain properly.

ATTENTION: When there is a possibility of surface water accumulating on the lot, a drain pipe must be installed to evacuate the excess water and prevent any risk of infiltration.

2.6 Final backfill of the shell

Complete the backfill. The backfill material must be placed with care and not dumped (do not compact with bulldozer). The backfill material must be sandy with little or no rocks or stones. Allow space for ground cover and make sure the lids are at least 50 mm (2") above the surface of the landscaped lot.

Before the final backfill of the model with integrated pump, do not forget the electrical wiring (consult next section of the guide).



2.7 Pump verification and electrical wiring (models with integrated pump)

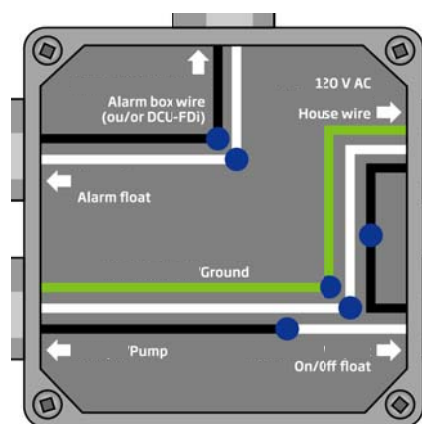
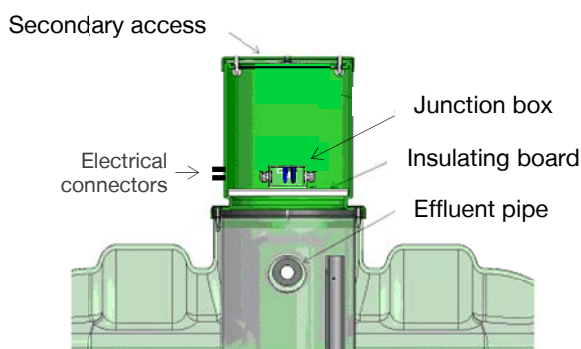
Step 1 Pump verification

Make sure there is no debris (sand, stone, gravel, tie-wrap, electrical components, tape, etc.) in the access well when the electrical wiring is complete. Visually inspect the components inside the access well (float tree, floats, pump) to make sure they are properly installed and will work as they should.

Step 2 Electrical wiring

The electrical wiring should be executed by an electrician. To wire the system to the residence, two (2) in-ground double strand supply cables are required. It is preferable to protect the wires with the appropriate piping before burying them. The wire rating must also be done by an electrician. One of the wires will be used for the power supply line while the other one will send the alarm float signal to the alarm box (**Item C**) or control panel (when required).

Waterproof electrical connectors (**Item E**) must be used to go through the secondary access.



IF YOUR LOCAL ELECTRIC CODE ALLOWS IT make the appropriate electrical connections using the supplied parts (junction box (**Item D**), waterproof screw-thread wire connectors and electrical connectors (**Item E**)) located in the components box. First, remove the connector plugs from the float and pump wires by cutting 5 cm (2") from the end. Make 2 holes of 2 cm (13/16") in diameter in one side of the secondary access well to pass the connectors through to the other side. Insert the wiring into the system through the 2 holes. The junction box is located in the secondary access on the insulating board. Identify and insert the wires into the junction box as shown in the diagram above. Use waterproof screw-thread wire connectors for the connections to ensure the water does not affect the electrical circuit. Follow the diagram's colour code. Since the white wire of the On/Off

float is connected to the pump's black wire (live wire), wrapping the white wire in black electrical tape is strongly recommended. Close the junction box. Pass the electrical wires from the pumping unit through the groove in the insulating board. Place the insulating board inside the access, install the junction box on top and close the lid of the secondary access.

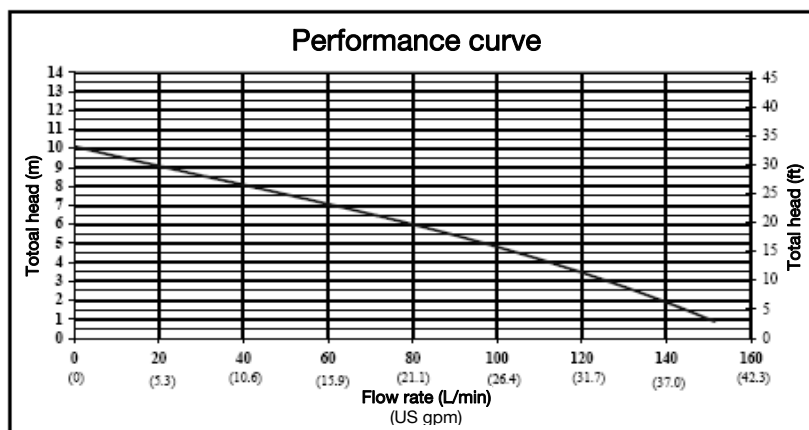
NOTE: Use two (2) separate circuit-breakers, one for the electrical power of the pump and the other for the alarm box connection. Do not connect anything else on these circuit-breakers (for example: household appliance). They must be used for the pump and the alarm box only.

The pumping unit uses 0.25 kWh per day.

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.

Pump characteristics:

- 0.3 HP
- 6.2 Amps
- 1 phase, 60 Hz, 115 V



2.8 System operation verification and warranty seals



After making sure the tipping bucket is fully operational and that the distribution plates are installed properly, install the insulating board inside the main access. Seal it shut by attaching the handle of the insulating board to the access of the **Ecoflo® Biofilter** using the two plastic fasteners. Finally, close the lid of the **Ecoflo® Biofilter**.

Don't forget the inspection permit, where applicable.

Check points following installation

- ☐ NEVER cover or bury the lids of your septic system with mulch, soil or a permanent structure. Always keep the lids accessible.
- ☐ The lids of your septic system must be at least 50 mm (2") above the surface of the landscaped lot.
- ☐ **NEVER install a riser on the access of a polyethylene Ecoflo® Biofilter.**
- ☐ NEVER plant a tree within 6 m (20') of the Ecoflo® Biofilter lid and within 2 m (6.5') of the absorption bed.
- ☐ NEVER open the lids or go inside the septic tank or biofilter.
- ☐ NEVER connect a drain pipe, roof gutter, sump pump or air conditioning drain to your septic system.
- ☐ NEVER operate a vehicle or place objects weighing over 225 kg (500 lbs) within 5 m (16.5') of the lid. Pass on this information to all those who have access to your system (landscaper, snow blower, etc.).
- ☐ NEVER let anything accumulate on top of your septic system (for example: compacted snow). The overload could damage the system.
- ☐ NEVER empty the backwash of a spa or pool into your septic system.
- ☐ NEVER empty wastewater of a recreational vehicle (camping trailer, caravan, etc.) into your septic system.
- ☐ NEVER use automatic toilet cleaners.
- ☐ If there is a delay in finishing the landscape after the initial installation of the system, place reference posts and protective fences to identify the location of the Ecoflo® Biofilter. This will prevent any circulation on the unit and help indicate the system's final level.
- ☐ If a pumping station is installed upstream of the Ecoflo® Biofilter, an airflow duct must be connected from the pumping station to the Ecoflo® Biofilter.
- ☐ Households must be equipped with an air vent that is in proper working condition and complies with the applicable standards. Premier Tech Aqua strongly recommends using a 100 mm (4") Ø pipe.
- ☐ Hand over the package containing the Owner's Manual and the Maintenance Agreement to the customer. This package is located inside the water intake protective cap.
- ☐ Remind the customer to fill out and sign the Maintenance Agreement. The customer must keep the white copy, give the yellow copy to the local regulatory body and send the pink copy to Premier Tech Aqua.

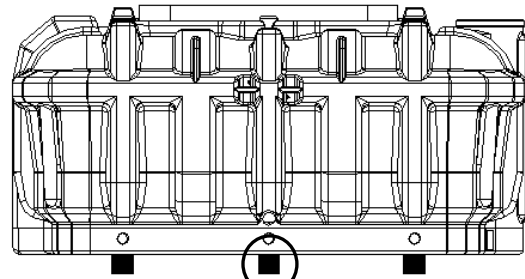
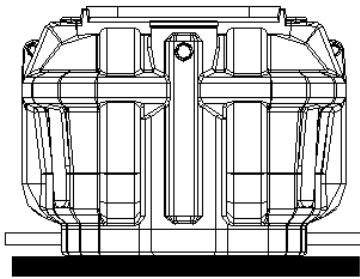
**If you have any problems, questions or comments, do not hesitate
to contact Premier Tech Aqua at 1 800 632-6356.**

3. Storage, handling and shipping

3.1 Storage

The Polyethylene Ecoflo® Biofilter:

- Comes fully assembled and includes all the necessary components to operate properly (tipping bucket, distribution plates, filtering media, etc.).
- Must rest on a flat, levelled and well drained surface.
- Can be stacked (two units maximum).
- The main and secondary access must be protected by a watertight device to prevent water from infiltrating into the system. If the protective devices should be damaged, they must be replaced immediately.
- Must be stored in a secure place, that is, a location in which there is no risk of impact, falling objects, landslides, rock avalanche, floods, etc.
- Must rest on at least two beams placed under the structural pipes. See diagram below.



Optional extra beam

3.2 Handling

3.2.1 Standard handling method

- Lifting rings should always be used unless a significant amount of water has infiltrated the system. In this case, refer to Section 3.2: *Handling systems in which water has infiltrated*.



- Lifting rings should always be used with lifting straps or shackles of appropriate size and capacity.

3.2.2 Handling systems in which water has infiltrated

If water has infiltrated the system during storage, it must be pumped out (refer to Section 5: *Pumping Procedure*). Lifting chains must be properly secured on the protruding galvanized pipes.



- Make sure the chains or lifting straps used to move the system are strong enough to withstand the water's additional weight. Even if the excess water is emptied from the shell, water absorbed by the filtering media still remains, please handle with care.
- Use equipment with adequate lifting capacity to handle the system. As specified above, the actual weight to be handled and the dry weight indicated on the first page of this document may differ significantly due to the amount of water in the system.

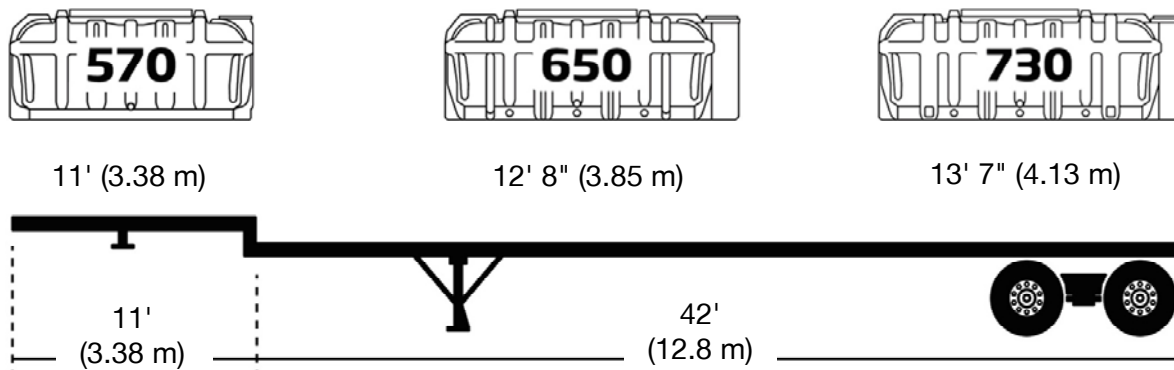
For both handling methods

- Always support the system with four (4) lifting points. Make sure the load is evenly distributed on the four (4) lifting points (lifting rings, galvanized pipes, etc).
- When handling the system, always keep it levelled to avoid movement of the components inside the shell.
- Carefully move the system making sure everyone keeps a safe distance from the system as well as the equipment on site.
- Handle the system gently and uniformly, sudden movements should be avoided.
- The handler is responsible for any damage caused to the system occurring while handling.
- Never handle more than one system at a time.

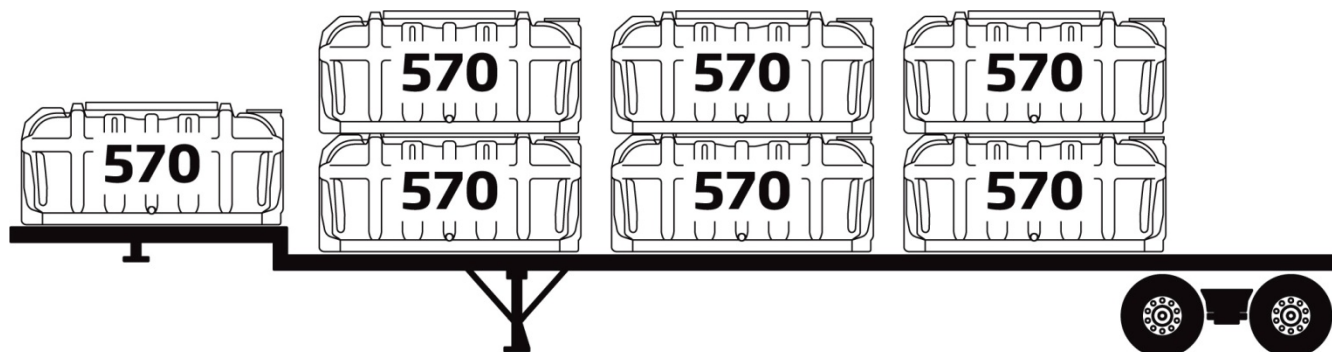
3.3 Shipping

3.3.1 Shipping Polyethylene Ecoflo® Biofilters from the manufacturer to the distributor

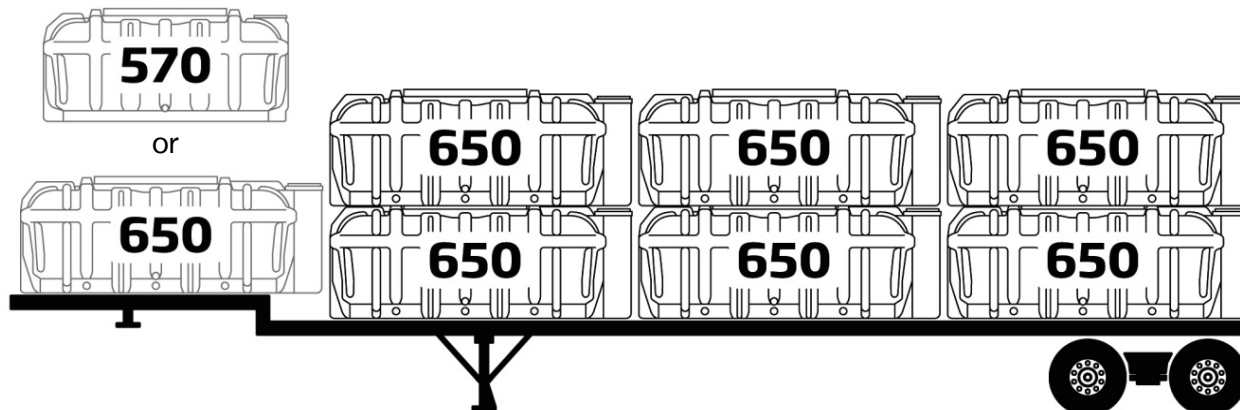
The load may vary depending on the type of trailer used. However, in order to maximize transportation, use a 53 ft drop-deck type trailer. The following image represents an example of the 570 series mounted on a drop-deck.



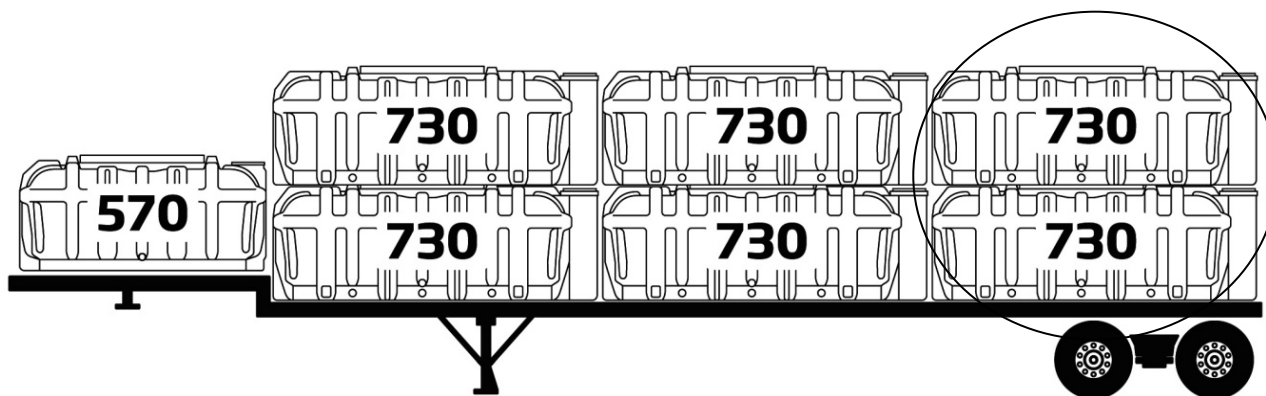
Length of 3 different Ecoflo® Polyethylene models and a low bed trailer



Typical configuration for 570 models

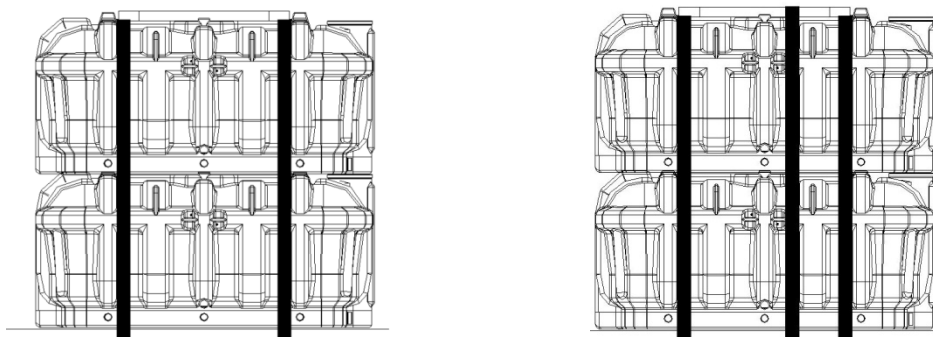


Typical configuration for 650 models



Typical configuration for 730 models

- Use two (2) straps per system or group of two (2) superposed systems.
- Use three (3) straps per system or group of two (2) superposed systems for the biofilters installed at the rear end of the trailer.
- Always position the straps according to the illustrations below.



- The systems must rest on a flat surface, free of any debris that can puncture or damage them.
- The carrier is responsible for complying with all laws and codes in effect.
- The carrier is responsible for any damage caused to the system occurring during shipment.

3.3.2 Shipping Polyethylene Ecoflo® Biofilters from the distributor to the installation site

- Use a trailer or vehicle with adequate loading space depending on the dimensions of the system.
- Use appropriate straps to support the systems properly and securely.
- The systems must rest on a flat surface, free of any debris that can puncture or damage them.
- The carrier is responsible for complying with all laws and codes in effect.
- The carrier is responsible for any damage caused to the system occurring during shipment.



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