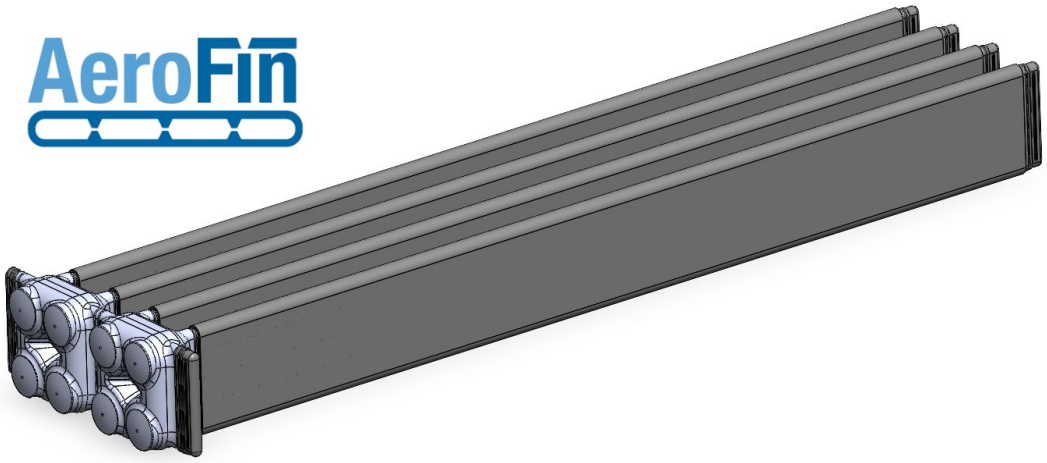
INFILTRATOR®
water technologies

Idaho

Infiltrator AeroFin™

DESIGN AND INSTALLATION MANUAL



The purpose of this manual is to provide the minimum specifications for design and installation of the Infiltrator AeroFin™ in Idaho. All state and local, ordinances, requirements, and procedures must be followed. Each revised version of this manual supersedes the previous version.

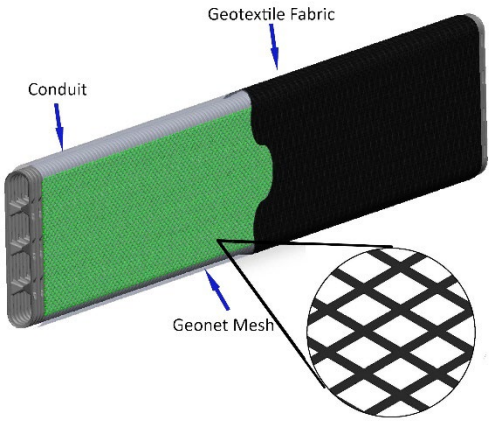
The configurations presented in this document are common designs and are provided for illustrative purposes. They are not intended to restrict the use of other configurations, which may be utilized provided the design conforms to state and local regulations, as applicable.

For more detailed design and installation information, please contact Infiltrator Water Technologies at 1-800-221-4436.

Table of Contents

The Infiltrator AeroFin™

The Infiltrator AeroFin™ (AeroFin) is a proprietary system consisting of four components. The first three components are fabricated in modules called "fins" that are installed within the fourth component, a tightly specified sand called "system sand". Effluent is dispersed, filtered, and treated by the components of the system through a combination of biological, physical, and chemical processes. The system operates as a media network to support colonized bacteria that treat organic waste.



After exiting the septic tank or treatment unit, effluent progresses through each component as follows:

- 12.75-inch-tall conduit;
- Geonet mesh (pictured in green for contrast);
- Geotextile fabric; and
- Minimum 6-inch (in)- layer of system sand.

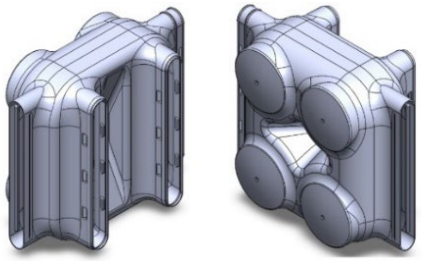
The AeroFin system produces 30-day average TSS and CBOD levels below 5 mg/L when tested in accordance with the NSF/ANSI 40 protocol. The AeroFin system is approved for use in the State of Idaho as a Proprietary Wastewater Treatment Product (PWTP) by the Water Quality Division of the Idaho Department of Environmental Quality (DEQ) in accordance with Section 1.4.2.4 of the Technical Guidance Manual (TGM) and IDAPA 58.01.03 (the Rules). The DEQ approval allows for design and installation of the AeroFin system in the State of Idaho with residential-strength effluent (Table 3-1 of the TGM) in accordance with the specifications and instructions in this manual. Relevant requirements in the current edition of the TGM shall be applicable.

AeroFin Laterals

The AeroFin laterals (fins) are produced in 8-foot (ft) segments for ease of transport and installation. Individual segments connect to one another using the built-in snap-lock feature to create fin lengths as required by the system design. This snap-lock feature also connects the fins to the AeroFin Manifold and the AeroFin Endcaps.

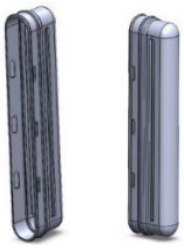
AeroFin Manifold

The AeroFin Manifold is installed at the head of the fin rows and provides equal distribution of effluent into the system. The AeroFin manifold is comprised of individual AeroFin manifold units, connected in series. Each AeroFin manifold unit includes a snap-lock feature which facilitates interconnecting individual manifold units with other manifold units in series as well as connecting the manifold to the fin rows. AeroFin manifold units may also be installed at the distal end of individual fin rows when venting is specified or for serial distribution.



AeroFin Endcap

AeroFin Endcaps are custom molded parts which function to stop flow in three places in the system: at the end of individual fin rows; on one of the two openings on a manifold unit if it is not in use in a given design (e.g. the number of fin rows is uneven); and at each end of the manifold.



System Sand

"System sand" is the term used to describe the specified sand material that is placed between, beside and below and the AeroFin conduits. Acceptable system sand is manufactured material that conforms with the description of "medium sand" in the TGM.

The following minimum system sand dimensions are required for all AeroFin configurations:

- a minimum of 12 in below the fin rows;
- a minimum of 6 in between the fin rows; and
- a minimum of 6 in on each side of the outermost fin rows; and
- a minimum of 6 in on each end of the fin rows.

No system sand is required over the system.

Upon exiting the system sand, the treated wastewater is absorbed into the native soils. Typical AeroFin layouts for level and sloped sites are portrayed in the system layouts section of this Infiltrator AeroFin Design and Installation Manual (Manual).

Information Specific to the Use of the AeroFin System in Idaho

- The minimum sizing requirement for AeroFin systems is one bedroom.
- System sand bed area cannot exceed 1,500 sf per field.
- Maximum site slope per IDAPA 58.01.03 rules (the Rules).
- In addition to the system sand specifications above, additional critical system design specifications include the following:
    - Minimum center-to-center fin spacing is 8.25 in to accommodate minimum 6 in system sand between fin rows.
    - Maximum width of the system sand extending from each end of the fin rows is 3 ft.
- Each row shall be installed level to within +/- ½ in (total of 1 in) of the specified elevation and preferably should be parallel to the contour of the site.
- It is most convenient if fin-row lengths are designed in 8 ft increments to accommodate the length of the product as manufactured. However, individual fin segments can be cut to any length.

Environmental Standards and Technical Support

All AeroFin systems shall be designed and installed in compliance with the procedures and specifications detailed in this Manual and in the product's state approval. This Manual is to be used in conjunction with the Rules. In the event of contradictions between this Manual and the Rules, Infiltrator should be contacted for technical assistance at (800) 221-4436.

Training and Certification Requirements

Designers and installers are required to attend a training/certification course on AeroFin presented by Infiltrator or its authorized representative. Infiltrator recommends that professionals involved in the review of AeroFin system designs and inspection of installed systems also become trained and certified.

AeroFin Conduit Requirement

Residential applications require 80 linear feet of AeroFin conduit per bedroom for the first 3 bedrooms then 40 ft per bedroom for each additional bedroom. Commercial applications require 1.88 linear feet of conduit for each gallon of daily design flow (DDF ÷ 1.88).

Daily Design Flow

Residential daily design flow for AES systems is calculated in accordance with the Rules. Systems servicing more than two residences shall use the commercial specifications detailed in the sizing tables. In accordance with the Rules, the daily design flow for any single-family residential system in Idaho is 150 gpd for the first bedroom and 50 gpd for each additional bedroom. When daily design flow is determined by empirical wastewater flow data for commercial systems, refer to the Rules.

Effluent (Wastewater) Strength

The minimum total fin length required is based on use with residential strength effluent that has received primary treatment in a septic tank. When designing a system for use with higher strength wastewater, such as commercial systems, contact Infiltrator for technical assistance at (800) 221-4456.

Septic Tank

AeroFin is designed for use following a septic tank and/or an advanced treatment system. All septic tanks and/or advanced treatment systems shall meet and be sized according to the Rules.

Water Purification Systems

Water purification systems and water softeners should not discharge into AeroFin. This “backwash” does not require treatment and the additional flow may overload the system. The Rules may allow for alternative means of disposal. If there is no alternative means of disposing of this backwash other than in the AeroFin, then the system size shall be increased. Contact Infiltrator for technical assistance at (800) 221-4456.

Separation Distances (Horizontal and Vertical)

Separation distances to the seasonal high-water table (SHWT) or other restrictive features are measured from the outermost edge of the system sand bed for horizontal separations and the sand/soil interface for vertical separations. Vertical separation distances shall meet the specifications detailed in TGM Table 4-19.

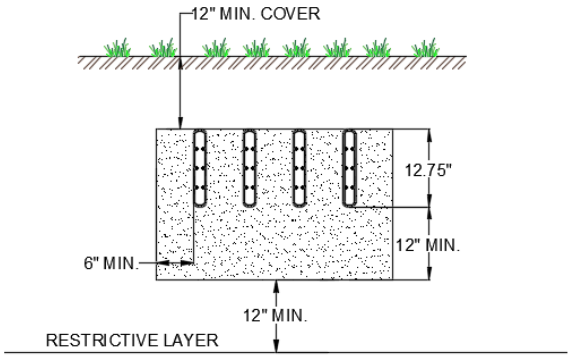


Table 1: AeroFin System Vertical Separation to Limiting Layers (ft)

Limiting Layer	Flow < 2,500 gpd All Soil Types
Impermeable layer	2
Fractured rock or very porous layer	1
Normal high ground water	1
Seasonal high ground water	1

System Soil Cover Material

A minimum of 12 in of suitable earth cover (topsoil or loam), with a texture similar to the soil at the site and capable of sustaining plant growth, must be placed above the installed system. The addition of filtration fabric on top of the AeroFin system is not required before placing cover material.

AeroFin in Trenches

AeroFin must be designed and installed in trench configurations whenever the site conditions allow. Critical design and installation considerations include but are not limited to the following:

- Trench systems may be placed on level or sloping terrain in accordance with the Rules.
- Maximum width of the system sand extending from the side of the outermost fin rows is 3 ft.
- Maximum trench width is 6 ft wide per the Rules.
- Trench separation shall be in accordance with the Rules.

Capping Fill Systems

Critical design and installation considerations include but are not limited to the following. Please consult the TGM for more detailed information.

- If any aspect of the capping soil system is above grade, the natural soil must be scarified to a depth of 6-8 inches.
- Materials used for the cap must meet the requirements of the TGM.
- Compaction of the scarified area must be prevented.

For additional details on design of the AeroFin system, including the capping fill system applications, please go to https://www.infiltratorwater.com/locations/Idaho and reference the “Quick Reference Guide” for the AeroFin system.

AeroFin in Beds

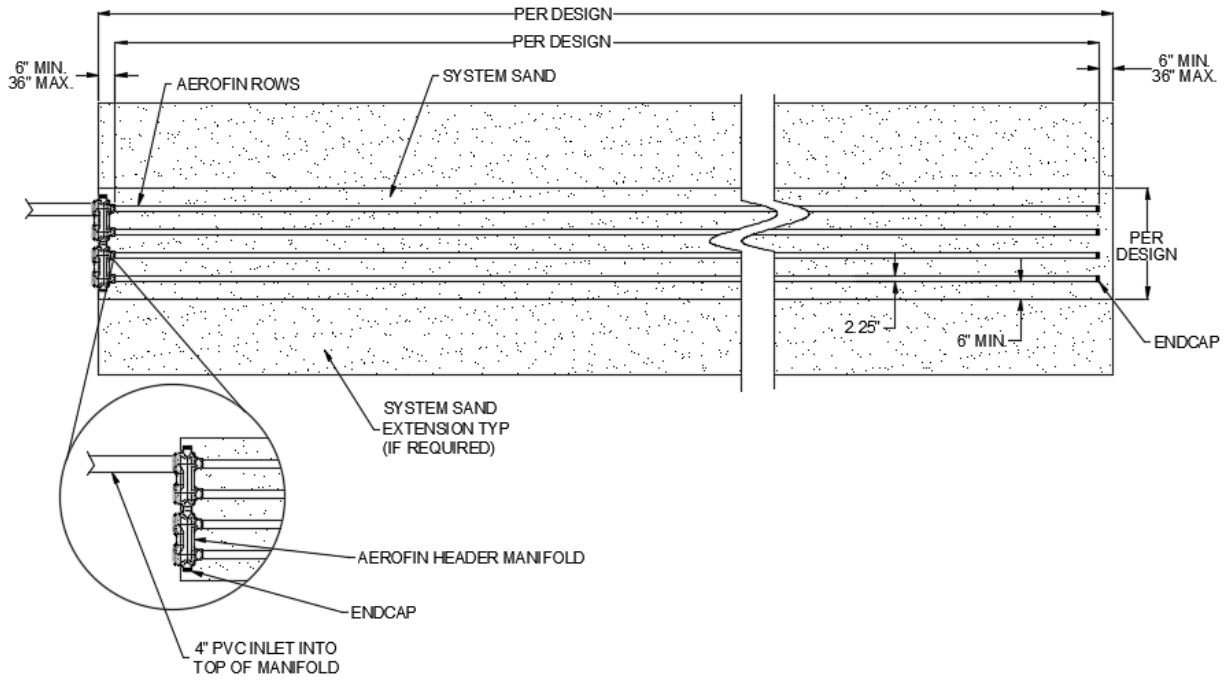
Bed configurations are only allowed when the site will not accommodate trench systems. All beds must be constructed level. Beds may not be placed on terrain with slopes in excess of 8%. All absorption beds must be approved to be used by the permitting health district prior to design or installation. A recommended design procedure, which shows equal spacing, is provided on page 14 of this Manual.

- Minimum center-to-center spacing of the AeroFin conduit rows is 8.25 in to accommodate minimum 6 in system sand between fin rows.
- Maximum center-to-center spacing of AeroFin conduit rows within the bed is 3 feet.

In this document minimum “system sand footprint area” refers to the surface onto which the fin rows are placed and the 6 in of system sand between and around the fins. Maintaining this minimum “system sand footprint area” is required to ensure adequate treatment. Minimum “bottom surface area” required refers to the minimum bottom surface area required based upon the soil loading rate for a given DDF. Maintaining this “bottom surface area” is required to ensure long-term hydraulic performance. “System sand extension” refers to the 6 in system sand layer(s) added to the “system sand footprint area” to make up the difference in area required between the minimum “system sand footprint area” and the minimum ”bottom surface area”. See next page for illustrations. Note: Not all systems will require ”system sand extensions”.

Parallel Distribution

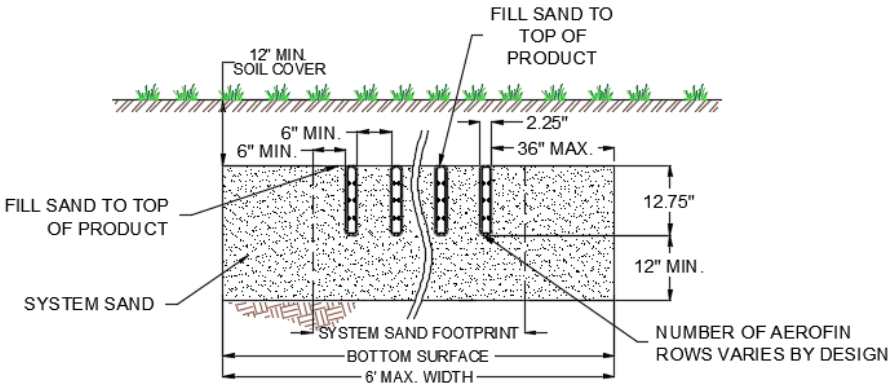
AeroFin systems may be designed using parallel distribution by interconnecting AeroFin Manifolds as shown below.



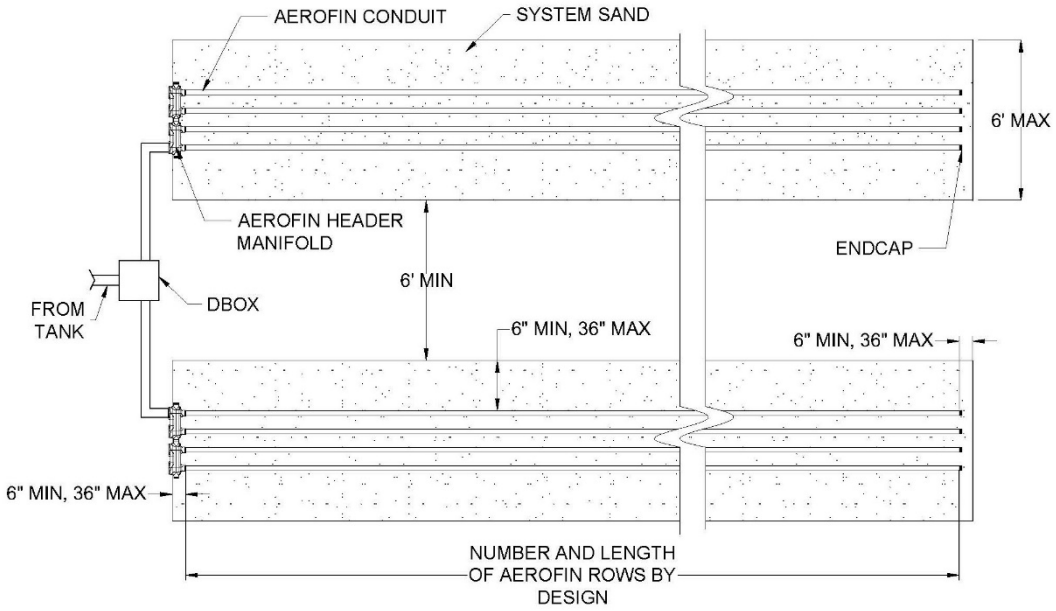
The system layouts presented in this section of the Manual are intended as general guidance. These designs are in no way intended to restrict design flexibility.

Trench Systems

Cross-Section View



Plan View

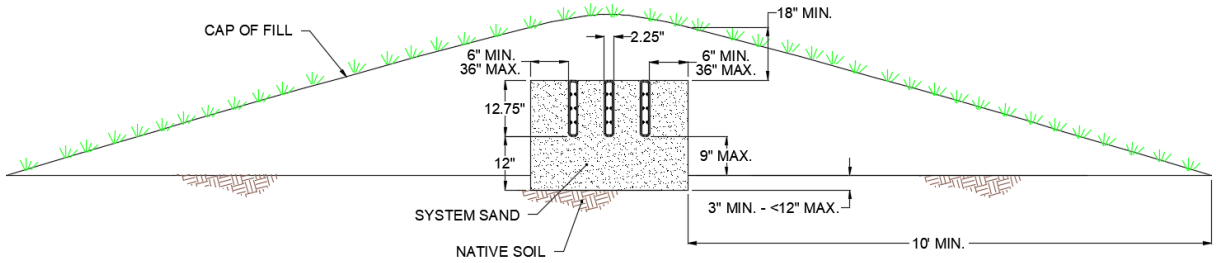


NOTES:

1. Number and length of fin rows shall be per the design.
2. Maximum trench width is 6 ft. Minimum trench width is 22.5 inches.
3. See Table 4 for minimum trench width required per number of conduit rows.
4. AeroFin rows shall be centered in trench.
5. Minimum of 6 in and maximum of 36 in sand required between trench walls and AeroFin conduit.
6. Minimum 6 inches sand required between conduit rows.
7. Pumping to the manifold is not permitted. Systems that require pumping or dosing must pump to a D-box then use gravity flow into the manifold.

Capping Fill Systems

Cross-Section View

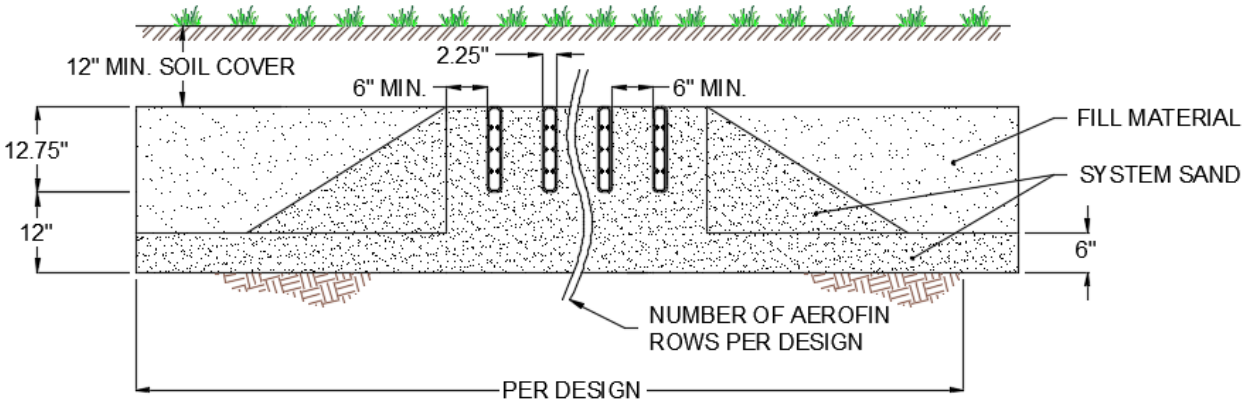


NOTES:

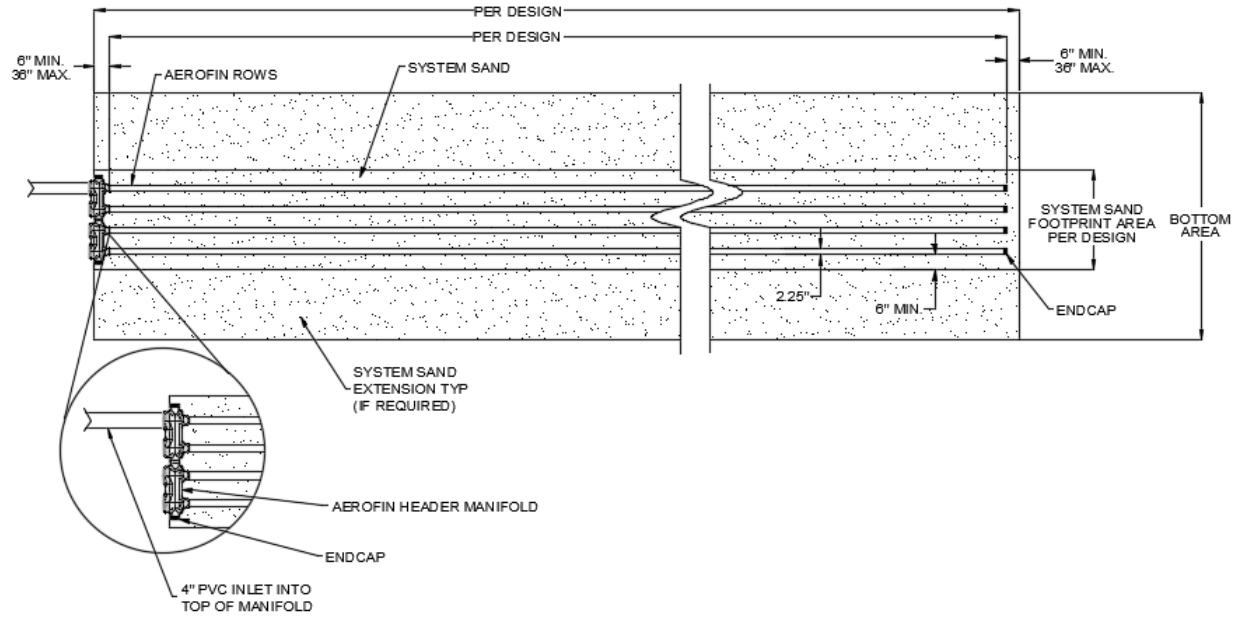
1. Minimum separation distances must be maintained between excavation bottom and limiting layer.
2. All aspects of Section 4.3.3 Above-Grade Capping Fill System in the TGM are applicable to design and installation.
3. Number and length of fin rows as per the design.
4. Maximum site slope of 20% for below grade or 12% for above grade capping fill system.
5. Minimum cover required for below grade capping fill system is 12 inches, minimum cover for above grade capping fill is 18 inches.
6. Pumping to the manifold is not permitted. Systems that require pumping or dosing must pump to a D-box then use gravity flow into the manifold.

Subsurface Bed Systems

Cross-Section View



Plan View



NOTES:

1. Number and length of fin rows shall be per the design.
2. Venting is not required but is optional at the discretion of the designer. Contact Infiltrator for technical assistance at (800) 221-4456.
3. Pumping to the manifold is not permitted. Systems that require pumping or dosing must pump to a D-box then use gravity flow into the manifold.

Trench Design Procedure

The AeroFin system can be designed in five simple steps. The sizing tables and design procedure are provided below, followed by several design examples for typical system configurations.

Step 1: Determine Daily Design Flow (DDF)

Determine the DDF in accordance with the Rule based on 150 gpd for the first bedroom and 50 gpd per bedroom for each additional bedroom for residential applications. For commercial applications, calculate DDF in accordance with Appendix D Table I of the Rule.

Step 2: Determine Minimum Length of Conduit Required

Determine the minimum length of conduit required from Table 2 based on the number of bedrooms. For commercial applications treating residential strength effluent, calculate the minimum length of conduit required at 1.88 gal/ft (DDF ÷ 1.88). Round up to an even number. When designing a system for use with higher strength wastewater contact Infiltrator for technical assistance at (800) 221-4456.

Table 2: Minimum total AeroFin conduit length

Number of Bedrooms	Minimum Total AeroFin Conduit Length (ft)
1	80
2	160
3	240
4	280
5	320
Each Add'l	40

Step 3: Determine the Minimum Bottom Surface Area Required

Using common practice and in accordance with the Rules, determine the soil type for the site. Given the soil type and the number of bedrooms in the design, determine the minimum area of bottom surface using Table 3. For commercial applications, calculate the minimum bottom surface area by dividing the DDF by the soil application rate (DDF ÷ SLR) from Table 3 below.

Table 3: Minimum area of bottom surface required (sf)

Bedrooms	Minimum Area of Bottom Surface Required (sf)						
	Application Rate (gpd/sf) / Soil Design Subgroup						
	1.7 / A-1	1.2 / A-2a	1.0 / A-2b	0.8 / B-1	0.6 / B-2	0.4 / C-1	0.3 / C-2
1	89	125	150	188	250	375	500
2	118	167	200	250	334	500	667
3	148	209	250	313	417	625	834
4	177	250	300	375	500	750	1000
5	206	292	350	438	584	875	1167
Each Add'l	30	42	50	63	84	125	167

NOTES: 1. Soil application rates used in calculating required bottom surface area taken from table 4-20 of the TGM for secondary biological treatment system hydraulic application rates.
2. Bottom surface area is calculated as DDF ÷ SLR.

Step 4: Design the System Sand Footprint Area (Configuration)

Determine the minimum system sand footprint area using the minimum length of conduit required as determined from Step 2 and the number of conduit rows into which the minimum length of conduit required will be divided. Consider the following for system sand footprint area design:

- Determine the conduit row length that best fits the site. Selected row length shall provide equal lengths of conduit. Maximum conduit row length is 100 ft.
- Determine the number of conduit rows required to meet the minimum length of conduit from Step 2.
- Use Table 2 to determine minimum trench or system sand bed width based on the number of conduit rows needed.

NOTE: Maximum trench width is 6 feet which will accommodate 8 fin rows. Systems requiring more than 8 fin rows will require multiple trenches or be designed in a bed configuration.

Table 4: Minimum System Sand Footprint Width

Minimum Width Per Number of Conduit Rows													
Trenches or Beds									**Beds Only**				
Number of Fin Rows	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Each Additional**
Minimum Width (ft)	1.19	1.88	2.57	**3.25**	3.94	4.63	5.32	6.00	6.69	7.38	8.07	8.75	0.69
Minimum Width (in)	14.25	22.5	30.8	39.0	47.2	55.5	63.8	72.0	80.2	88.5	96.8	105.0	8.3

Step 5: Make area adjustments, as necessary.

The minimum areas determined in Steps 3 and 4 cannot be reduced. These areas must be maintained to ensure adequate area for placement of the AeroFin system and infiltration of treated effluent into the native soil.

Area adjustments may be necessary as follows:

- If the minimum bottom surface area determined using Table 3 (Step 3) is smaller than the area of the system sand footprint determined in Step 4, no area adjustments are necessary.
- If the minimum bottom surface area determined using Table 3 (Step 3) is larger than the area of the system sand footprint determined in Step 4, the system sand footprint must be increased by widening or lengthening the trench or by splitting the design into multiple trenches.

In most instances, the width of the system sand component is widened to increase the system sand footprint. Conduit rows may be a maximum of 100 ft long for a 101 ft long trench to accommodate minimum 6 in sand on ends. If additional area is needed to meet the minimum bottom surface area determined in Step 3, the 6 inches of sand on the ends of the trench may be increased up to 3 ft.

NOTE: *The conduit must be no greater than 3-foot from the end of the trench. If necessary, additional conduit may be required.*

Design Example

System sample specifications:
4-bedroom home
Soil: B-1; 0.8 gpd/sf hydraulic application rate

Step 1: Determine Daily Design Flow (DDF)
Residential design is for a 4-bedroom home. DDF for 4 bedrooms is 150 gpd for br #1 and 50 gpd for each additional br: 150 + (50 x 3) = 300 gpd.

Step 2 Determine Minimum Length of Conduit Required
For a 4-bedroom home, the minimum conduit length required is 280 ft per Table 2.

Number of Bedrooms	Minimum Total AeroFin Conduit Length (ft)
1	80
2	160
3	240
4	**280**
5	320
Each Add'l	40

Table 2: Minimum total AeroFin conduit length

Step 3: Determine the Minimum Bottom Surface Area Required
Per Table 3, the minimum bottom surface area required for a 4-bedroom design on a site with B-1 soils and a 0.8 application rate is 375 sf.

	Minimum Area of Bottom Surface Required (sf)						
	Application Rate (gpd/sf) / Soil Design Subgroup						
Bedrooms	**1.7 / A-1**	**1.2 / A-2a**	**1.0 / A-2b**	**0.8 / B-1**	**0.6 / B-2**	**0.4 / C-1**	**0.3 / C-2**
1	89	125	150	188	250	375	500
2	118	167	200	250	334	500	667
3	148	209	250	313	417	625	834
4	177	250	300	**375**	500	750	1000
5	206	292	350	438	584	875	1167
Each Add'l	30	42	50	63	84	125	167

Table 3: Minimum area of bottom surface required (sf)

Step 4: Design the System Sand Configuration
Considering the site, a row length of 72 ft is selected to eliminate cutting. 72 ft-long rows will require 4 rows of conduit providing 288 total ft of conduit. This meets the 280 ft minimum length requirement from Step 2. Referencing Table 2, the minimum system sand bed width required for 4 conduit rows is 3.25 ft (39 in).

Minimum Width Per Number of Conduit Rows													
	Trenches or Beds								Beds Only				
Number of Fin Rows	1	2	3	4	5	6	7	8	9	10	11	12	Each Additional
Minimum Width (ft)	1.19	1.88	2.57	**3.25**	3.94	4.63	5.32	6.00	6.69	7.38	8.07	8.75	0.69
Minimum Width (in)	14.25	22.5	30.8	39.0	47.2	55.5	63.8	72.0	80.2	88.5	96.8	105.0	8.3

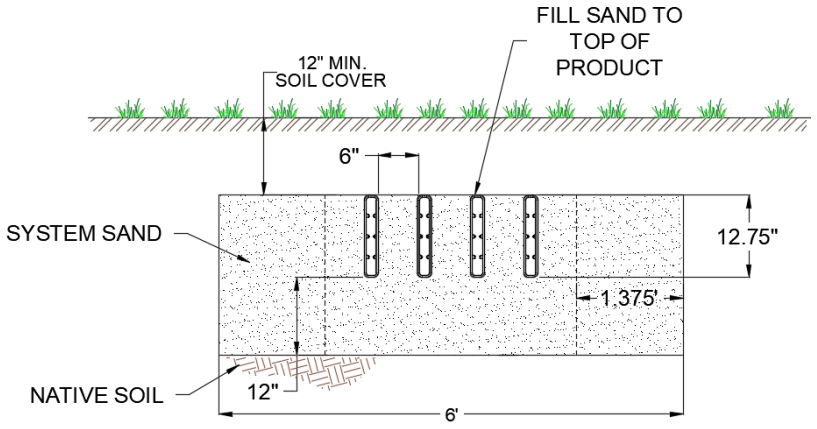
Table 4: Minimum System Sand Footprint Width

Step 5: Make area adjustments, as necessary.

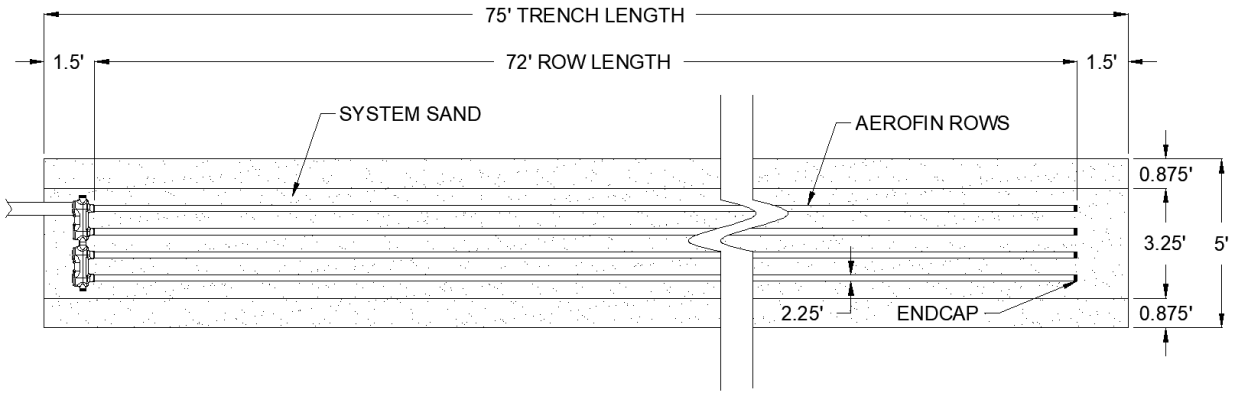
From Step 3 the system sand configuration is 4 rows 72 ft long and a trench dimension of 3.25 ft wide by 73 ft long, which results in a total system sand footprint of 237.25 sf (3.25 ft x 73 ft = 237.25 sf).

- From Step 4 the system requires a minimum bottom surface area of 375 sf. 375 sf is greater than the 237.25 sf system sand footprint. Therefore, adjustments to the size of the system sand footprint are necessary. This can be accomplished by widening and/or lengthening the trench.
  - Select a trench width suitable for the site. Using the maximum 5 ft wide trench will provide 365 sf (73 ft x 5 ft = 365 sf) of bottom surface area which does not meet the minimum 375 sf. Additional adjustments will be required.
  - To maintain the use of one 5 ft-wide trench, the trench length must be increased to meet the 375 sf minimum. 375 ft ÷ 5 ft = 75 ft. Providing conduit rows of 72 ft and 1.5 ft of sand on each end).
- The width of the 3.25 ft-wide system sand footprint must be increased to 5.0 ft and the length of the trench must be increased to 75 ft. Final trench dimensions are 75 ft x 5 ft for a total bottom surface area of 375 sf.

Cross-Section:



Plan View:



Bed Design Procedure

Designing an AeroFin system in a bed design consists of a five-step process. A bed system exceeds the 6-foot maximum width of a trench and utilizes system sand extensions to meet the required bed bottom area. The process is the same as the trench design process except for the 5th and final step where the need for system sand extensions is addressed. Bed designs use the same sizing tables as trenches provided above.

Step 1: Determine Daily Design Flow (DDF)
Determine the DDF in accordance with the Rule based on 150 gpd for the first bedroom and 50 gpd per bedroom for each additional bedroom for residential applications. For commercial applications, calculate DDF in accordance with Appendix D Table I of the Rule.

Step 2: Determine Minimum Length of Conduit Required
Determine the minimum length of conduit required from Table 2 based on the number of bedrooms. For commercial applications treating residential strength effluent, calculate the minimum length of conduit required at 1.88 gal/ft (DDF ÷ 1.88). Round up to an even number. When designing a system for use with higher strength wastewater contact Infiltrator for technical assistance at (800) 221-4456.

Step 3: Determine the Minimum Bottom Surface Area Required
Using common practice and in accordance with the Rules, determine the soil type for the site. Given the soil type and the number of bedrooms in the design, determine the minimum bottom surface area required using Table 3. For commercial applications, calculate the minimum surface bottom area by dividing the DDF by the soil application rate from Table 3 below.

Step 4: Design the System Configuration
Determine the minimum system sand footprint area using the minimum length of conduit required as determined from Step 2 and the number of conduit rows into which the minimum length of conduit required will be divided. Consider the following for system sand footprint area design:

- Determine the conduit row length that best fits the site.
- Determine the number of conduit rows required to meet the minimum length of conduit from Step 2.
- Use Table 2 to determine the minimum system sand bed width based on the number of conduit rows needed.

Step 5: Make area adjustments, as necessary.
The minimum areas determined in Steps 3 and 4 cannot be reduced. These areas must be maintained to ensure adequate area for placement of the AeroFin system and infiltration of treated effluent into the native soil.

Area adjustments may be necessary as follows:

- If the minimum bottom surface area required determined using Table 3 (Step 3) is smaller than the area of the system sand footprint determined in Step 4, no area adjustments are necessary.
- If the minimum SSBA determined using Table 3 (Step 3) is larger than the area of the system sand footprint determined in Step 4, the system sand footprint must be increased by widening and/or lengthening the bed.

In most instances, the width of the system sand component is widened by including 6 in deep system sand extensions (SSEs) to increase the system sand footprint. When making adjustments to the width of the system sand footprint:

- In level system applications, additional width shall be evenly divided on each side of the AeroFin minimum basal area.
- In sloped system applications, additional width shall be entirely placed on the downslope side of the AeroFin minimum basal area.

NOTE: *Conduit rows may be a maximum of 100 ft long for a 101 ft long bed to accommodate minimum 6 in sand on ends. If additional area is needed to meet the minimum bottom surface area determined in Step 3, the 6 inches of sand on the ends of the trench may be increased up to 3 ft. The conduit must be no greater than 3-foot from the end of the trench. If necessary, additional conduit may be required.*

Design Example

System sample specifications:
3-bedroom home
Soil: C-2; 0.3 gpd/sf hydraulic application rate

Step 1: Determine Daily Design Flow (DDF)
Residential design is for a 3-bedroom home for a DDF of 3 bedrooms is 150 gpd for br #1 and 50 gpd for each additional br 150 + (50 x 2) = 250 gpd.

Number of Bedrooms	Minimum Total AeroFin Conduit Length (ft)
1	80
2	160
3	**240**
4	280
5	320
Each Add'l	40

Table 2: Minimum total AeroFin conduit length

Step 2 Determine Minimum Length of Conduit Required
For a 3-bedroom home, the minimum conduit length required is 240 ft, per Table 2.

Step 3: Determine the Minimum System Sand Bed Area (SSBA)
Per Table 3, the minimum SSBA required for a 3-bedroom design on a site with C-2 soils and a 0.3 application rate is 834 sf.

	Minimum Area of Bottom Surface Required (sf)						
	Application Rate (gpd/sf) / Soil Design Subgroup						
Bedrooms	**1.7 / A-1**	**1.2 / A-2a**	**1.0 / A-2b**	**0.8 / B-1**	**0.6 / B-2**	**0.4 / C-1**	**0.3 / C-2**
1	89	125	150	188	250	375	500
2	118	167	200	250	334	500	667
3	148	209	250	313	417	625	**834**
4	177	250	300	375	500	750	1000
5	206	292	350	438	584	875	1167
Each Additional	30	42	50	63	84	125	167

Table 3: Minimum area of bottom surface required (sf)

Step 4: Design the System Sand Configuration

Considering the site, a row length of 80 ft is selected. 80 ft-long rows will require 3 rows of conduit providing 240 total ft of conduit. This meets the 240 ft minimum length requirement from Step 2. Referencing Table 4, the system sand bed width required for 3 conduit rows is 2.57 ft (30.8 in).

Number of Fin Rows	*Minimum Width Per Number of Conduit Rows*												
	Trenches or Beds								Beds Only				
	1	2	3	4	5	6	7	8	9	10	11	12	Each Additional
Minimum Width (ft)	~~1.19~~	~~1.88~~	**2.57**	3.25	3.94	4.63	5.32	6.00	6.69	7.38	8.07	8.75	0.69
Minimum Width (in)	14.25	22.5	30.8	39.0	47.2	55.5	63.8	72.0	80.2	88.5	96.8	105.0	8.3

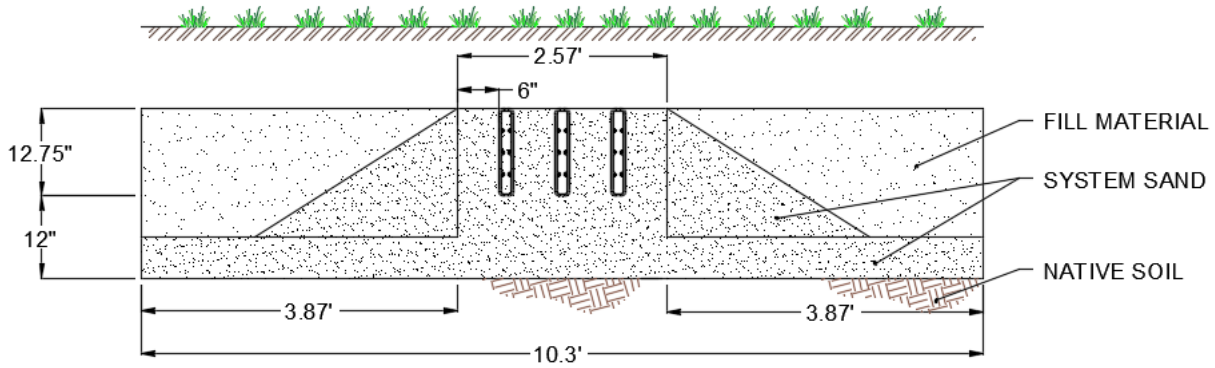
Table 4: Minimum System Sand Footprint Width

Step 5: Make area adjustments, as necessary.

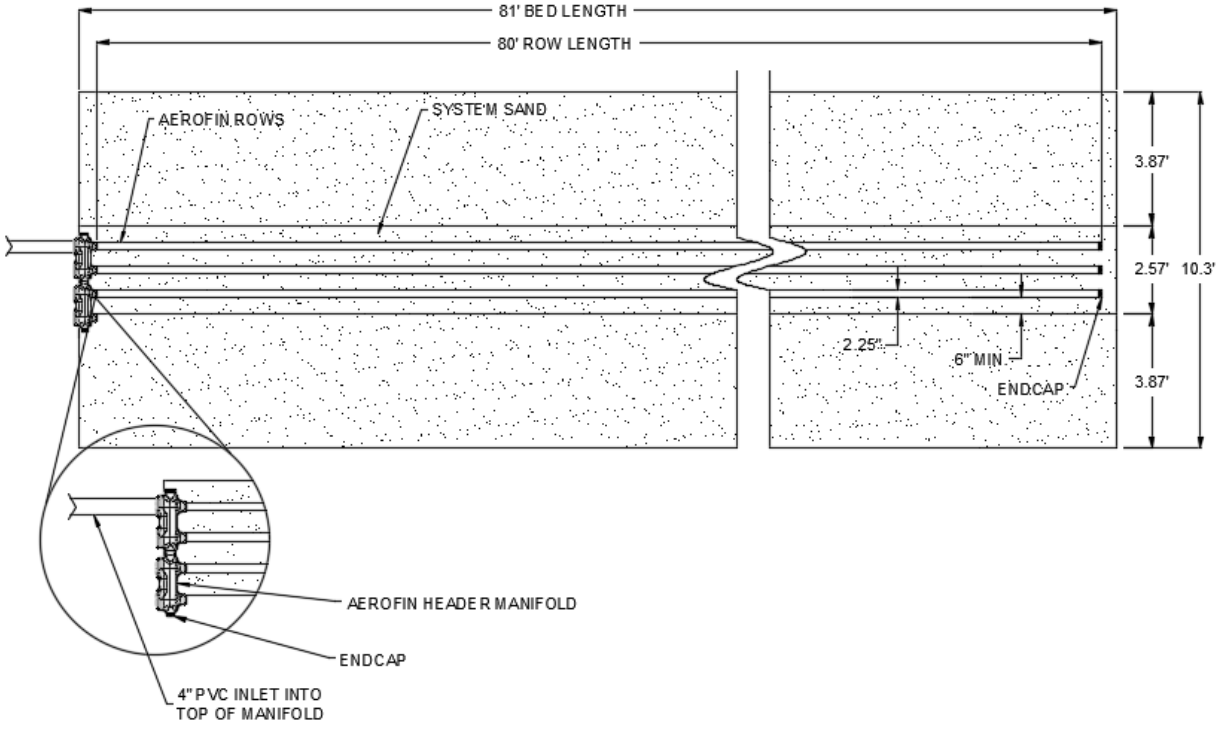
From Step 4 the system sand configuration is 3 rows 80 ft long and a bed dimension of 2.57 ft wide by 81 ft long, which results in a total system sand footprint of 208.17 sf.

- From Step 4 the system requires a minimum bottom surface area of 834 sf. 834 sf is greater than the 208.17 sf system sand footprint. Therefore, adjustments to the size of the system sand footprint are necessary by widening and/or lengthening the bed.
  - Select a bed width suitable for the site. To determine the minimum width needed to meet the minimum bottom surface area required, divide the required bottom surface area required (from Step 3) by the selected row length plus the sand on each end. 834 sf ÷ 81 ft = 10.3 ft.
- The width of the 2.57 ft-wide system sand footprint must be increased to 10.3 ft by adding system sand extensions to each side of the system sand footprint. (10.3 ft – 2.57 ft) ÷ 2 = 3.87 ft. Final bed dimensions are 81 ft x 10.3 ft (3.87 ft + 2.57 ft + 3.87 ft = 10.3 ft for a total bottom surface area of 834.3 sf.

Cross-Section:



Plan View:


81' BED LENGTH
80' ROW LENGTH
AEROFIN ROWS
SYSTEM SAND
3.87'
2.57'
10.3'
3.87'
2.25"
6" MIN
ENDCAP
AEROFIN HEADER MANIFOLD
ENDCAP
4" PVC INLET INTO
TOP OF MANIFOLD

Before You Begin

These installation instructions are for AeroFin. AeroFin may only be installed according to applicable state and local health permitting authority requirements.

If unsure of the installation requirements for a site, contact your permitting authority. If unsure of the applicability of AeroFin for a given site, contact Infiltrator Water Technologies. The soil and site evaluation and the design of the onsite system must be reviewed, approved and a construction permit obtained from the local permitting authority before installation.

Materials and Equipment Needed

- ☐ AeroFin
- ☐ AeroFin Manifold
- ☐ AeroFin Endcaps
- ☐ System sand
- ☐ AeroFin Row Spacer(s)
- ☐ PVC pipe and couplings
- ☐ Excavation equipment
- ☐ Laser, transit or level
- ☐ Shovel and rake
- ☐ 4-in inspection port and cap
- ☐ Tape measure

Common practices shall apply to the installation of AeroFin. These include, but are not limited to:

- ☐ avoid soil compaction on the infiltrative surface area, including all areas downslope of a sloped system;
- ☐ use a tracked vehicle for material installation if possible;
- ☐ avoid installation during wet periods; and
- ☐ install the AeroFin components and system sand on the same day that the system footprint is excavated/exposed.

Handling Instructions

Compression of the AeroFin components during transport, storage, or construction shall be avoided.

Excavating and Preparing the Site

NOTE: *Do not install the system during periods when the soil is sufficiently wet to exceed its plastic limit, as this causes construction machinery to smear the soil.*

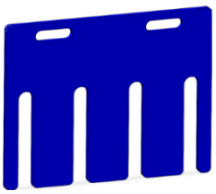
1. Stake out the locations of tank(s), pipes, and corners of the system to be tilled/excavated, per system design. Set the elevations as shown on the approved plan.
2. Install sedimentation and erosion control measures if required or needed.

   NOTE: *The installation of temporary drainage swales/berms (surface diversions) may be necessary to protect the site during rainfall events.*
3. Excavate the system area or till the ground as per the design.
4. Rake the bottom and sides (when applicable) of the excavation if smearing has occurred during excavation. Remove large stones and protruding roots.

   NOTE*: Smearing does not occur in sandy soils, so raking is not necessary. In fine textured soils (silts and clays), avoid walking on the excavation bottom to prevent compaction and loss of soil structure.*
5. Verify that the system area is at the proper elevation and slope from side-to-side and from end-to-end using a level, transit, or laser.

Installing AeroFin

1. Install the 6 in deep system sand basal layer over the entire bed area as per the design. System sand should be leveled and stabilized prior to placement of the AeroFin system. Installer should retain records certifying that system sand meets ASTM C-33 requirements.
2. Assemble the AeroFin Manifold and place it in the proper location(s) on the system sand basal area.
3. Place AeroFin components on the surface of the system sand in the configuration shown on the system design. Using the snap-lock feature, snap the fins to the AeroFin Manifold, then connect fins end-to-end to create rows of the required length. Ensure that filter fabric from each fin unit mates tightly, without gaps which expose openings on the sidewalls, with fabric on the next fin unit.
4. Fin rows shall be installed level to within +/- ½ in (total 1 in tolerance) of the specified elevation. A laser level or transit is recommended to ensure proper alignment.
5. Fin rows shall be:
   - installed parallel to the contours; and
   - separated by a minimum of 6 in of system sand.



AeroFin Row Spacer

Infiltrator offers an installation aid for installing fin rows, ensuring the minimum 6 in of system sand between fin rows is maintained throughout the system and fins do not move during installation. The AeroFin row spacer is reusable and available where AeroFin components are sold.

6. Once the fins are placed on the surface of the system sand and the distal end manifold system and/or end caps are connected to the fins per design, additional system sand shall be ladled between and to the top of each of the fin rows and lightly compacted by walking in the sand after placement for fin stabilization and support. System sand shall also be installed on each side and at each end of the backfilled fin rows, per the design.
7. Remove AeroFin row spacers and store for next system installation.

Covering the System

NOTE: *Before backfilling, the system shall be inspected and approved by a representative of the local permitting authority, in compliance with state and local regulations and procedures.*

1. Material placed around the system sand and above the fins may be additional system sand or material meeting state and local requirements. However, the final 6 in placed above or adjacent to the fins shall be comprised of material that will sustain plant growth.
2. Backfill the system by pushing material over the AeroFin system. It is best to mound several extra inches of soil over the finish grade to allow for settling. This also ensures that runoff is diverted away from the system. Keep a minimum of 12 in of consolidated cover over the fins before driving over the system with tracked equipment. Do not drive over the system while backfilling in sand.
3. After the system is covered, the site should be seeded or sodded to mitigate the potential for erosion.

NOTE: *If the system is for new home construction, it is important to leave marking stakes along the boundary of the system. This will notify contractors of the system location so they will not cross it with equipment or vehicles. Vehicles and equipment should remain clear of the downslope side of the system.*

An AeroFin system may be out of sight, but it definitely should not be out of mind. With proper standard maintenance and by being more aware of daily living habits, AeroFin users will greatly improve the life and health of the system. Here are some guidelines to help you protect your investment.

Inside the Home

1. Large volumes of water over a short period of time will flush untreated solids out of the septic tank into the leachfield.
    - Practice conservation every day.
    - Space out heavy water-using activities such as washing clothes and taking showers.
    - Repair leaky faucets and valves. Consider replacing old fixtures with new low-flow fixtures.

2. Remember that an onsite wastewater treatment system uses natural biological processes so only biodegradable waste should go in it.
    - No cigarette butts, tissues, sanitary napkins, disposable diapers, cat litter, coffee grounds, or cotton swabs, etc.
    - No paints, oils, chemical drain cleaners, thinners, solvents, poisons, or pesticides. These toxic chemicals not only kill helpful bacteria but may contaminate the groundwater.
    - No grease or cooking oils. Grease may harden in the septic tank's scum layer and accumulate until it blocks the inlet or outlet. Hot grease poured down the drain may run through the septic tank and then harden, clogging the system.
    - Minimize garbage disposal use. A garbage disposal typically doubles the rate of solids buildup in the septic tank. To avoid frequent pump outs, compost your food scraps or put it in the trash.
    - Be cautious with household chemicals. Disinfectants, ammonia, bathroom cleaners, bleach, etc. can kill the bacteria the system needs to operate properly. Allow the system to dilute and neutralize them a little at a time.

Outside the Home

1. Have your tank checked for sludge and scum accumulation by a licensed contractor every two to three years. If you have high water usage or a garbage disposal, the inspections should be more frequent.
2. Keep surface water away from the AeroFin installation area. Divert downspouts, roof drainage, driveway runoff, and sump pump discharge away from the system. Landscape the yard to channel rainwater away.
3. Encourage the right plants. Remove trees such as willows that like "wet feet". Their roots may penetrate and damage the dispersal area. Grow grass or native ground cover over the system to prevent soil erosion.
4. Avoid physical damage. Don't drive over the system or compact the soil with heavy equipment. Don't dig in or build anything on the system.

Trouble Shooting

In the event of a system malfunction, contact a licensed contractor. Indications the system may need service include persistent septic odor; unusually wet area atop and/or around the system; "ponding" of effluent on the surface; or "breakout" of effluent along the side of a slope.

Repair

The licensed contractor shall be contacted when there are indications of malfunction with AeroFin. When visiting the site, the licensed contractor shall do the following:

- Assess the present condition of the AeroFin system, and the surrounding area
- Research the history of use, including:
    - water volume use
    - contaminants
- Evaluate site for groundwater intrusion and surface water drainage patterns
- Inspect septic tank
- Inspect the fins
- Check the home for leaks

Upon completion of the site visit, the licensed contractor can contact the Infiltrator Water Technologies Technical Services Department for assistance if necessary.

INFILTRATOR WATER TECHNOLOGIES STANDARD LIMITED WARRANTY

(a) The structural integrity of each unit, end cap and other accessory manufactured by Infiltrator (collectively referred to as "Units"), when installed and operated in an onsite wastewater system in accordance with Infiltrator's installation instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date upon which a septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required for the septic system by applicable law, the one (1) year warranty period will begin upon the date that installation of the septic system commences. In order to exercise its warranty rights, Holder must notify Infiltrator in writing at its corporate headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for those Units determined by Infiltrator to be defective and covered by this Limited Warranty. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

(c) This Limited Warranty shall be void if any part of the AeroFin system (unit, end cap or other accessory) is manufactured by anyone other than Infiltrator. The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage are damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper siting or improper sizing, excessive water usage, improper grease disposal, or improper operation; or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty.

Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change this Limited Warranty in any manner whatsoever, or to extend this Limited Warranty. No warranty applies to any party other than the original Holder.

The above represents the standard Limited Warranty offered by Infiltrator. A limited number of states and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's corporate headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.

INFILTRATOR® water technologies

4 Business Park Road
P.O. Box 768
Old Saybrook, CT 06475
860-577-7000 • Fax 860-577-7001
1-800-221-4436
www.infiltratorwater.com

Patents: https://www.infiltratorwater.com/patents/

Infiltrator Water technologies is a wholly owned subsidiary of Advanced Drainage Systems, Inc. (ADS).

 AF12 0323