

Unit 1 - Design Criteria

1-1 General Specifications and Disposal Area Options

1-2 Filter Requirements, Sand Specifications, and Installation Requirements

1-3 Construction of the Sand Filter

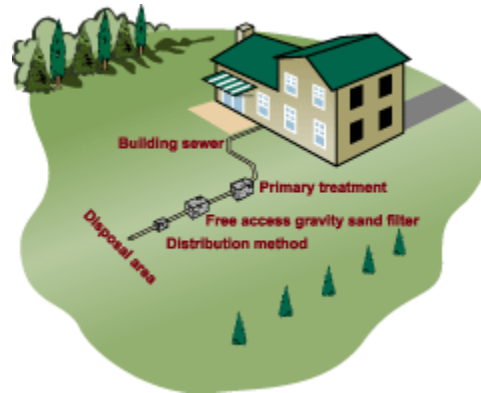
Unit 2 - Maintenance

2-1 Maintenance Recommendations

What You Will Learn in This Lesson

In this lesson, you will learn that the free access gravity sand filter provides secondary treatment. You will also learn about the general design criteria for this filter system, as specified in the DEP Alternate Systems Guidance (guidance), including:

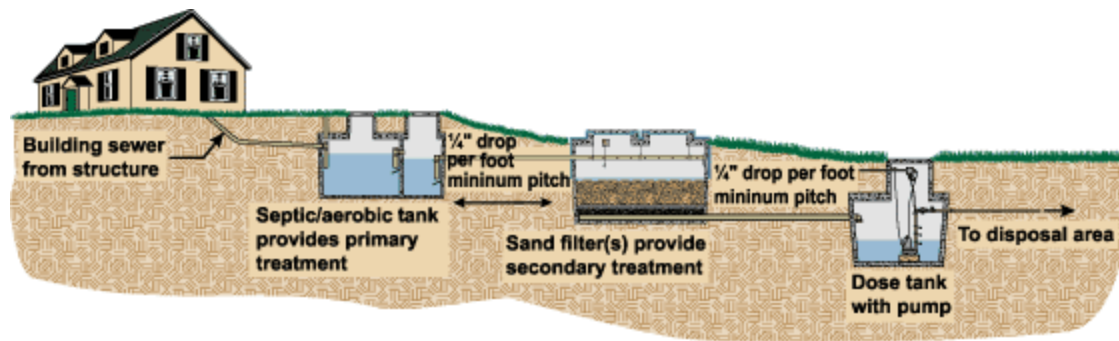
- 1) Sewage flows,
- 2) Primary treatment options and treatment tank specifications, and
- 3) Disposal area options.



Free Access Gravity Sand Filter

The free access gravity sand filter provides secondary treatment for waste with residential flow characteristics. This means the effluent has gone through primary treatment in a septic tank(s) or an aerobic tank before it goes through the sand filter for further treatment (secondary treatment). The filter provides an environment for biological renovation, which allows aerobic bacteria to grow and renovate the wastewater prior to release into the disposal area.

The diagram below shows a free access gravity sand filter used as secondary treatment for an onlot septic system.



Free Access Gravity Sand Filter

The free access gravity sand filter may be used as secondary treatment with the alternate at-grade absorption area or the alternate drip irrigation system. Additionally, the free access gravity sand filter may be used as secondary treatment with any onlot system as described in Chapter 73 of the regulations. In any of these cases, the use of a free access gravity sand filter would be classified as an alternate system for permit issuance.

General Design Criteria

Now we are going to discuss the general design criteria for the sand filter. The items below will be covered in the lesson.

- 1) Sewage flows,**
- 2) Primary treatment options and treatment tank specifications, and**
- 3) Disposal area options.**

1) Sewage Flows

To use a free access gravity sand filter, the guidance requires a structure to have residential flow characteristics. Please take a moment now to review criteria for this type of flow in the "Residential Flow Characteristics" job aid from the link below. This document can also be found in job aids under "Residential Flow Characteristics" and in the glossary.

[Click here to open and print the "Residential Flow Characteristics" job aid.](#)

Note: If the proposed structure is not residential, but the flow from the structure has the same characteristics as residential flow, a free access gravity sand filter may be used on the site. The only exception is with the IRSIS, as it can only be used with flows from a single family residential dwelling.



2) Primary Treatment Options

According to the guidance, primary treatment may be provided by either an aerobic tank or septic tank(s).

AEROBIC TANK

If an [aerobic tank](#) is used as the primary treatment tank, it must comply with the regulations that specify standards for aerobic treatment tanks.



Section 73.32

To review the standards for aerobic treatment tanks, see Section 73.32 of the regulations.



Section 4.C.3

Note: No reduction in the size of the absorption area is allowed when an aerobic tank is used with a free access gravity sand filter.

2) Primary Treatment Options

SEPTIC TANK(S)

If a septic tank(s) is used as the primary treatment with the free access gravity sand filter system, the tank(s) must meet all the regulations regarding septic treatment tank(s).



Section 73.31

To review the standards for septic treatment tanks, see Section 73.31 of the regulations.



Section 4.B.1

The guidance further requires the septic treatment tank be either a multiple-compartmented rectangular tank or two rectangular tanks in a series.



2) Primary Treatment Options

SEPTIC TANK(S)

OPTIONAL EFFLUENT FILTER ON OUTLET OF SEPTIC TANK

There are several types of **optional** effluent filters that may be placed on the outlet of a septic tank. This filter helps prevent solid particles from leaving the septic tank.

The photo to the right shows one type of effluent filter that may be used on the outlet of a septic tank.



2) Primary Treatment Options

SEPTIC TANK(S)

REQUIRED SOLIDS RETAINER



Section 73.31.c.5

The regulations **REQUIRE** a solids retainer at the outlet baffle or vented tee at the last compartment of the septic tank, and define a solids retainer as a deflection device designed to deflect buoyed solids from escaping the tank.

The optional effluent filter may not always replace the solids retainer. However, many effluent filters meet the requirements of a solids retainer. If this is the case, the effluent filter may serve as both the effluent filter and the solids retainer.

Please take a moment now to review the four diagrams in the "Solids Retainers" job aid from the link below. This document can also be found in job aids under "Solids Retainers."

[Click here to open and print the "Solids Retainers" job aid.](#)

Review

An SEO was reviewing a design with the items listed below.



If all other items were correct on the permit, would any of the items listed below cause the SEO to deny the permit application for a free access gravity flow sand filter?

Click on the item, if any, that would cause the SEO to deny the permit.

- A) 400 gpd with residential sewage flows
- B) Rectangular septic tanks
- C) Septic solids retainer on the outlet of the last septic tank
- D) Effluent filter not used
- E) All the items above meet the guidance requirements

Submit

3) Disposal Area Options

When using a free access gravity sand filter as secondary treatment, the guidance allows final treatment and disposal of effluent in one of the following disposal areas:

- A conventional system as described in Chapter 73
- An alternate at-grade absorption area
- An alternate drip irrigation system disposal area

3) Disposal Area Options

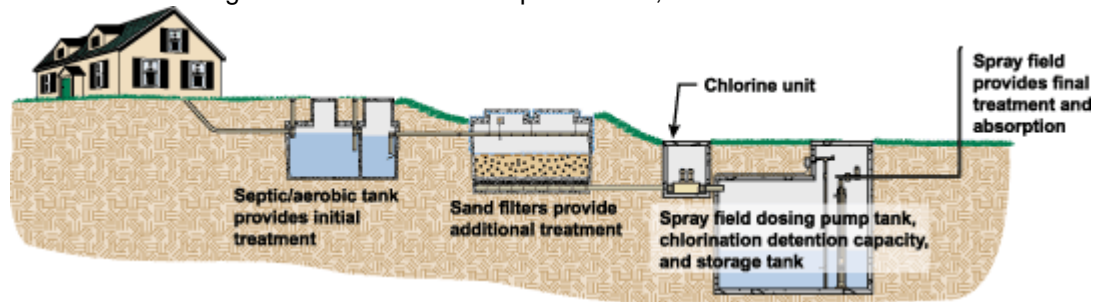
A) A CONVENTIONAL SYSTEM AS DESCRIBED IN CHAPTER 73



Section 73.162

A common way to use the free access gravity sand filter with a conventional system is to replace the intermittent sand filters in an individual residential spray irrigation system (IRSIS) with the free access gravity flow sand filter. The free access gravity sand filter may be used as a 1:1 replacement for the intermittent sand filter described in Section 73.162 of the regulations for IRSIS permitted by the local agency. The filter could also be used with other conventional systems to provide secondary treatment.

Change: *The free access gravity sand filter may be used as a 1:1 replacement for the intermittent sand filter described in Section 73.162 of the regulations for IRSIS permitted by the local agency.* The 1:1 was added to the guidance released on September 20, 2003.



3) Disposal Area Options

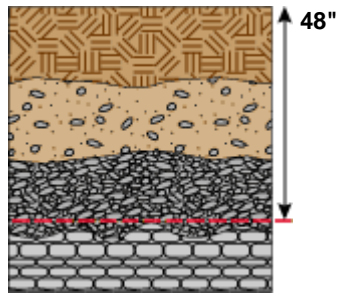
B) AN ALTERNATE AT-GRADE BED ABSORPTION AREA



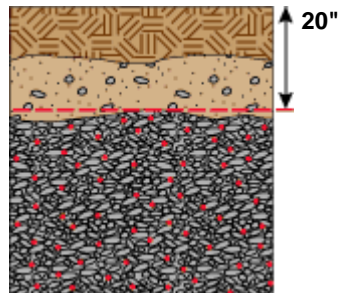
Section 4.C.5

The guidance also allows a free access gravity sand filter to be used as the secondary treatment option for an alternate at-grade bed absorption area. To use the at-grade bed and gravity sand filter there must be a minimum of 20 inches of suitable soil between the bottom of the proposed absorption area aggregate and the limiting zone.

The alternate at-grade bed absorption area without the use of the sand filter requires a minimum of 48 inches of suitable soil.



- At-grade bed **without** the sand filter.
- Minimum 48 inches of suitable soil.



- At-grade bed **with** the sand filter.
- Minimum 20 inches of suitable soil.

Note: For more information about the at-grade system, review the course # 329, "At-Grade Bed Systems," at www.seotraining.org.

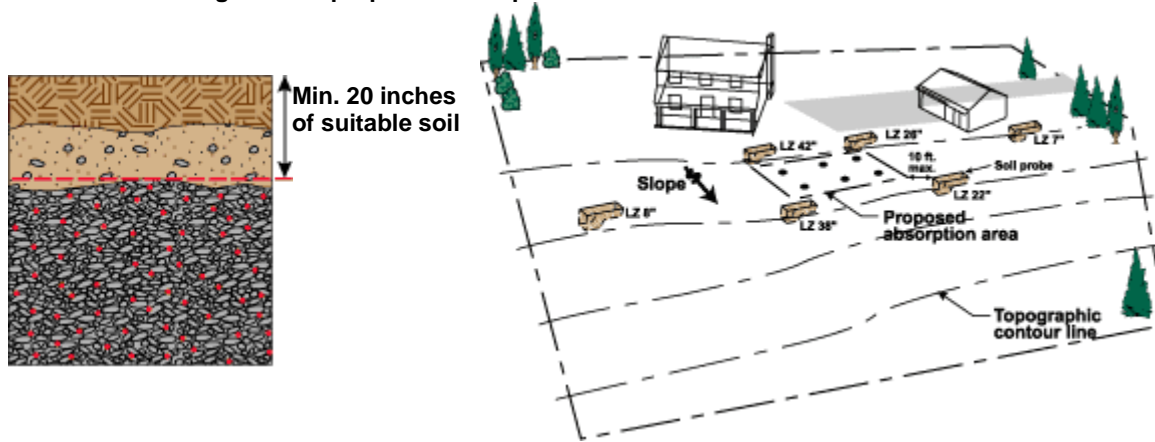
3) Disposal Area Options

B) AN ALTERNATE AT-GRADE BED ABSORPTION AREA



Section 4.C.2

When the at-grade bed absorption area is being proposed, [sufficient soil profiles](#) and [hand auger evaluations](#) must be done. The tests are needed to assure that there is a **minimum of 20 inches of suitable soil** throughout the proposed absorption area.



3) Disposal Area Options

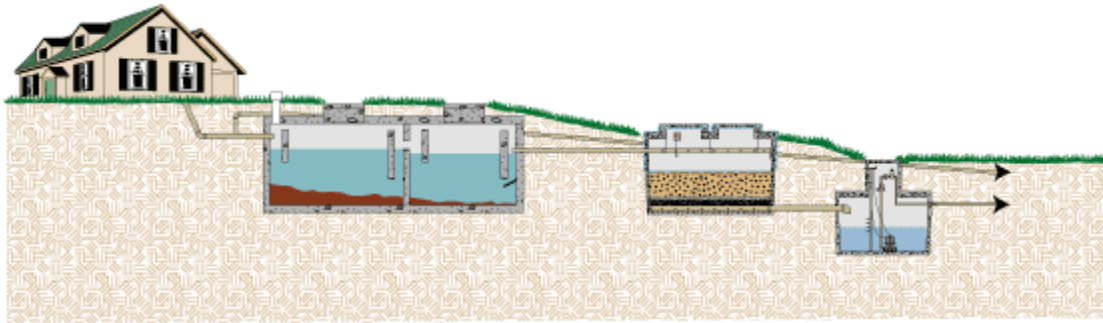
C) AN ALTERNATE DRIP IRRIGATION SYSTEM

The free access gravity sand filter option may be used with an alternate drip irrigation system that is designed in accordance with Section 12 of the guidance. The gravity sand filter would replace the intermittent sand filters described in Chapter 73, Section 73.162 of the regulations.

Click on the links below to view each filter option.

[Intermittent filter option](#)

[Gravity sand filter option](#)



Review



When may an alternate free access gravity sand filter be used? With a(n) _____.
Click on all that apply.

- A) Conventional IRSIS
- B) Alternate at-grade absorption area
- C) Alternate drip irrigation

Submit

Reset

General Disposal Area Specifications

When an alternate free access gravity sand filter is used, three additional requirements apply:



Section 4.C.3

1) No size reduction may be taken in the absorption area if an aerobic tank or [leaching chambers](#) are being used.



Section 4.C.4

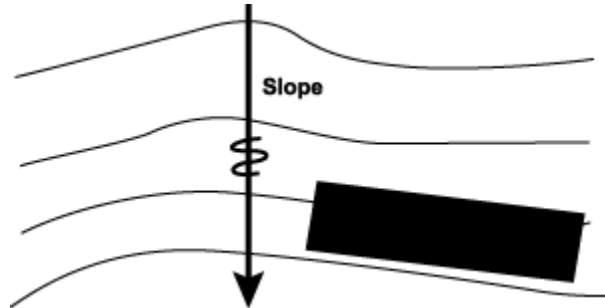
2) For repair situations, the square footage of the absorption area must be as close to the sizing of a full-sized system as possible.

General Disposal Area Specifications



Section 4.C.6

3) If an absorption area bed is used, the length of the bed must be parallel to contours. This is to keep the [horizontal linear load](#) as low as possible.



Lesson Summary

In this lesson, you learned:

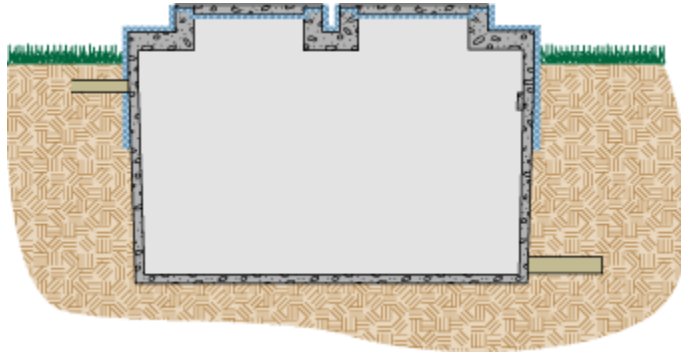
- 1) The alternate free access gravity sand filter is a treatment option.
- 2) The system option may only be used to treat sewage having sewage flow characteristics.
- 3) An aerobic or tank(s) may be used for primary treatment.
- 4) An alternate free access gravity sand filter may be used with a system as described in Chapter 73 of the regulations, an alternate at-grade bed absorption area, or an alternate disposal area.
- 5) No reduction in the absorption area may be taken when an aerobic tank or leaching chambers are used with the alternative free access gravity sand filter. In a repair situation, however, size reduction may be altered, but the disposal area should be as as possible up to the size of the full sized system.
- 6) The length of the disposal area bed must be placed along .

What You Will Learn in This Lesson

In this lesson, you will learn about some of the DEP Alternate Systems Guidance (guidance) requirements for the free access gravity sand filter. The following items will be covered in this lesson:

- 1) Sand filter
- 2) Sand used in the filter
- 3) Installation of the filter

This illustration shows an alternate free access gravity sand filter tank.



Sand Filter-Sizing

SINGLE-FAMILY DWELLING



Section 4.B.2.a

The guidance specifies the surface area of the sand filter must be at least **40 square feet for a single-family dwelling with three bedrooms or less**. Ten square feet must be added for each additional bedroom over three.

Using these specifications, the following sand filter tank determinations can be made:

3-bedroom dwelling = 40 square feet of sand filter surface area (minimum)

5-bedroom dwelling = 60 square feet of sand filter surface area (minimum)

Sand Filter-Sizing

OTHER STRUCTURES

Other structures not used as single-family dwellings employ the same sizing criteria to calculate the size of the filter. The filter tank must be at least 40 square feet, and 10 square feet must be added for every 100 gallons per day (gpd) over 400 gpd. Always round up to the nearest 100 gpd.

Note: The sand filter tank may be oversized. If the filter tank is oversized to accommodate future growth, do not forget to oversize the disposal area as well.

Note: The IRSIS may only be used for single-family dwellings.

Sand Filter-Sizing

OTHER STRUCTURES

To determine the size of the filter tank, you will need to calculate the daily flow. Use Section 73.17 of the regulations to determine the daily flow. For every 100 gpd of daily sewage flow over 400 gpd, add 10 square feet to the minimum 40 square feet of sand filter surface area.

Warehouse with residential flow characteristics and 15 employees.

To calculate the daily sewage flow for a warehouse, the regulations state that you must use 35 gallons per day per employee.

Start calculation

Sand Filter-Sizing

EXAMPLE:

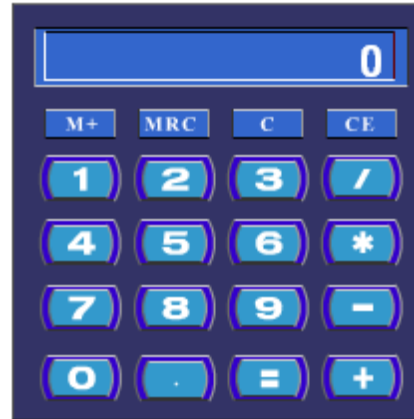


An office with eight employees has a daily sewage flow of 10 gpd per person, requiring an alternate free access gravity sand filter with a minimum of _____ square feet of surface area.

Use the calculator to determine the minimum surface area size of the filter in square feet.

- A) 40
- B) 50
- C) 60
- D) 70

Submit



Sand Filter-Construction

Along with sizing specifications, the guidance also provides some specifications for the filter tank construction. The following pages will discuss the items listed below.

- 1) Overall tank
- 2) Wall thickness
- 3) Filter tank depth



Section 4.B.2.b, c, and e

To examine these specifications in the guidance, review Section 4.B.2.b, c, and e.

Sand Filter-Construction

1) OVERALL TANK



Section 4.B.2.b

The filter tank must be watertight and made of sound, durable material not subject to excessive corrosion or decay.

If ground or surface water infiltrates into the filter tank, the system could become [hydraulically overloaded](#), and the filter or disposal area may malfunction. The filter tank must also be durable and non-corrosive as the environment is conducive to corrosion. Over time corrosion or decay could cause water infiltration in areas where it may not be seen or noticed until it becomes a problem.

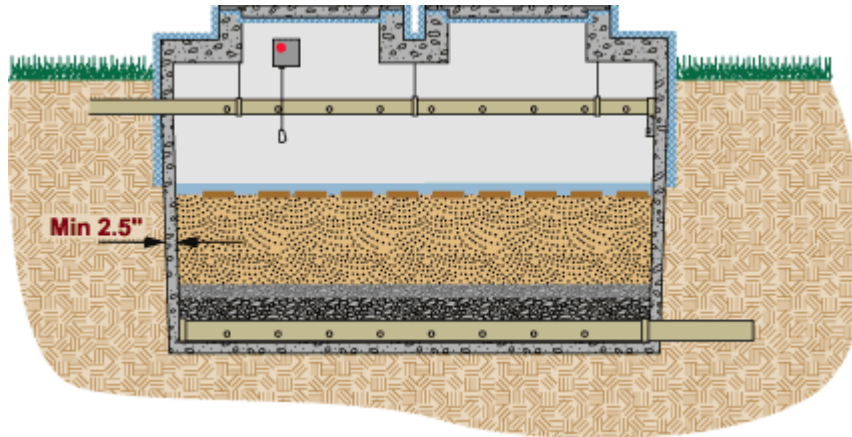
Sand Filter-Construction

2) WALL THICKNESS



Section 4.B.2.c

Concrete tanks must have a minimum wall thickness of **2 1/2 inches** and be adequately reinforced.



Sand Filter-Construction

3) FILTER TANK DEPTH



Section 4.B.2.e

The filter tank must be designed and constructed so that the depth from the cover to the top of the sand layer provides sufficient [freeboard](#) to allow for maintenance of the sand surface. The depth of materials in the filter will be discussed in Lesson 1-3.

There must be enough room between the sand and the top of the filter tank to be able to physically rake the sand. Access is crucial since the sand should be raked every three to four months to maintain the sand surface. The photo shows a person raking the sand in a filter. Further maintenance requirements will be covered in Lesson 2-1.



Sand Filter-Construction



Jake Wilson, an SEO, was conducting a final inspection of an alternate free access gravity sand filter system. Upon closer inspection of the filter tank, he found that the tank had the following characteristics. Which, if any, of the characteristics would *not* meet the guidance specifications?

- A) Made of durable non-corrosive materials and is watertight.
- B) Constructed of 2-inch-thick reinforced concrete walls.
- C) The depth from the cover to the top of the sand surface allows for maintenance.
- D) All the characteristics meet the guidance specifications.

Submit

Sand Filter-Construction

ACCESS LIDS

The guidance provides some specifications for the access lids to the filter. The following pages will discuss these items listed below.

- 1) Precast slabs as tank tops
- 2) Opening size
- 3) Security



Section 4.B.2.d, f, and h

To examine the specifications in the guidance, review Section 4.B.2. d, f, and h of the guidance.

Sand Filter-Construction

ACCESS LIDS



Section 4.B.2.d

1) Precast Slabs as Tank Tops

If precast slabs are used as tank tops to support the access covers, the slabs must be at least **three** inches thick and adequately reinforced.



Sand Filter-Construction

ACCESS LIDS

1) Precast Slabs as Tank Tops

There must be a seal between the slab tank top and the tank. The picture below shows a [mastic seal](#) between the two layers. The purpose of this seal is to prevent water infiltration into the filter. Make sure the seal is in contact with both pieces of concrete all the way around the filter to assure the filter tank is watertight.



Sand Filter-Construction

ACCESS LIDS



Section 4.B.2.f

2) Opening Size

There must be a minimum of two 36- by 36-inch openings or one opening that is greater than or equal to 36 inches that provides access to the entire surface of the filter. The openings can be round, square, or rectangular. If two openings are used, the distance between the openings cannot exceed 36 inches.

Change: The explanation that one opening can be used and the additional requirement that two openings cannot be greater than 36 inches apart was added to the guidance released on February 6, 2004.



The photo shows one of the 36- by 36-inch access lids on the filter.

Sand Filter-Construction

ACCESS LIDS



Section 4.B.2.h

3) Security

The access covers must be constructed of sturdy, lightweight materials that facilitate easy removal or manual repositioning to allow for routine maintenance of the filter. It must also be secured against unauthorized access.

Change: *The access covers must be constructed of sturdy, lightweight materials that facilitate easy removal or manual repositioning to allow for routine maintenance of the filter.* The requirement for the access covers to be constructed with sturdy, lightweight materials and that they must facilitate manual reposition was added to the guidance released on September 20, 2003.

Sand Filter

REVIEW



While performing the same final inspection of the alternate free access gravity sand filter, Jake Wilson was examining the access lids of the filter tank. Would any of the characteristics listed below *not* meet the guidance specifications?

- A) A 3-inch-thick precast slab tank top that is adequately reinforced
- B) Seal between the filter wall and the tank top, which is in contact with both the filter wall and the tank top around the entire filter.
- C) Constructed with two 36-by-36 inch openings, which provide access to the entire sand surface area.
- D) Access covers secured against unauthorized access.
- E) All the characteristics meet the guidance specifications.

Submit

Sand Media Specifications

To ensure the correct sand is being used in the filter, the guidance requires the sand to be delivered with a certificate to certify that the sand in the filter meets the guidance requirements.

This certification must include the following:

- Name of the supplier
- Testing results and testing date
- Amount of material purchased
- Delivery date

The SEO must verify the sand certificate and make sure the correct sand is being used in the filter.



Section 4.B.3 and 4

You can find media (sand) requirements in Section 4.B.3 of the guidance and certification requirements in Section 4.B.4 of the guidance.

Sand Media Specifications



Section 4.B.3

Sand that meets the specifications below may be used in a free access gravity sand filter. This sand is finer than the sand in an elevated sand mound.

The certificate must show the sand has test results that meet the guidance requirements. **The list below shows the required test results:**

- An effective size of between 0.3 and 0.6 mm
- An uniformity coefficient of 3.5 or less
- Less than four percent of the coarse aggregate passing the #100 sieve
- Does not contain more than 15 percent [deleterious material](#) by weight

Sand Media Specifications



Section 4.B.3

The tests used to determine if the sand meets the guidance requirements are all Department of Transportation tests. The test numbers are listed below with the corresponding test.

Sieve Analysis--PTM #616

Uniformity Coefficient--PTM #149

Deleterious Material--PTM #510

Sand Media Specifications

This picture shows elevated sand mound sand in the left hand and sand filter sand in the right hand. Note the difference in the particle size of the sand. The sand for the filter is like fine sand from a beach.

It is important to use the correct sand, because the sand surface area of a filter is much smaller than the area of an elevated sand mound.



Sand Media Specifications



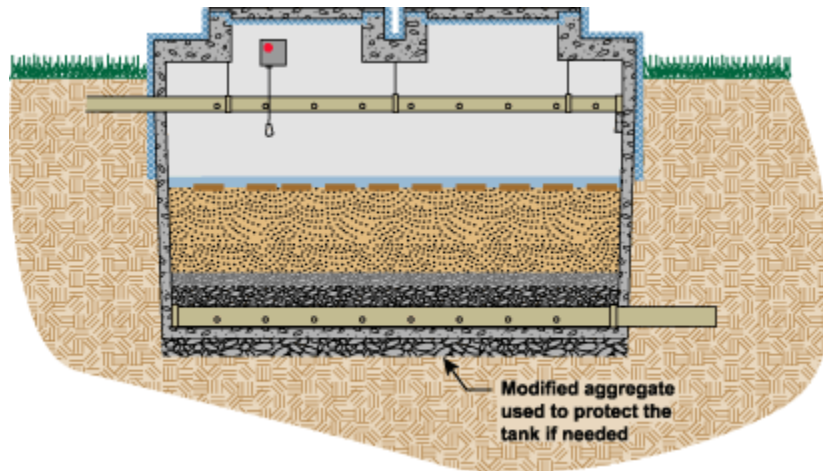
Which part of the sand specification listed below must be changed to meet the guidance requirements?

- **Effective size between 0.3 to 0.6 mm**
 - **A uniformity coefficient of 4.5 or less**
 - **Less than four percent of the coarse aggregate passing the #100 sieve**
-
- A) The effective size should be between 0.6 to 0.9.
 - B) The uniformity coefficient should be 3.5 or less.
 - C) The sieve should be #200.

Submit

Filter Tank Installation

The filter should be installed on a firm level base of compacted dirt or modified aggregate. These steps are taken because a rock under the filter tank could cause it to crack and liquid to infiltrate into or leak out of the filter.



Filter Tank Installation



Sections 4.B.2.f and 4.B.2.g

According to the guidance, the filter wall must be installed to extend a minimum of **six inches** above final grade. This extension helps to prevent water infiltration and provides for ease of access for periodic maintenance. If the tank access openings are at least 1,600 square inches, the tank may be set to a maximum of 12 inches below final grade. Even though the tank is below final grade, the access opening must still be six inches above final grade.

Change: *If the tank access openings are at least 1,600 square inches, the tank may be set to a maximum of 12 inches below final grade.*



Sand Filter Installation

REVIEW

While nearing the end of the same final inspection of the alternate free access gravity sand filter, Jake Wilson discovered the filter tank installation had the following characteristics:

- Situated on a firm base of compacted soil
- Tank wall extended a minimum of six inches above the final grade



Does the filter tank in this situation meet the guidance specifications?

- A) Yes
- B) No

Submit

Lesson Summary

In this lesson, you learned the alternate guidance requirements for the following components of a free access gravity sand filter:

1) Sand filter tank

- Minimum square feet of sand filter surface area and add 10 square feet for every 100 gallons per day (gpd) over 400 gpd.
- Filter tank must be watertight.
- Wall thickness must be inches minimum.
- Filter depth must be deep enough to provide room for .
- Precast slabs as filter tops must be watertight and inches thick minimum.
- Opening size of the access lid per filter must be a minimum of inches.
- The access lids must be secured against unauthorized access.

Lesson Summary Continued

2) Sand used in the filter must meet the following criteria:

- An effective size of between 0.3 and 0.6 mm
- An uniformity coefficient of 3.5 or less
- Less than four percent of the coarse aggregate passing the #100 sieve
- Not contain more than 15 percent by weight

3) Installation

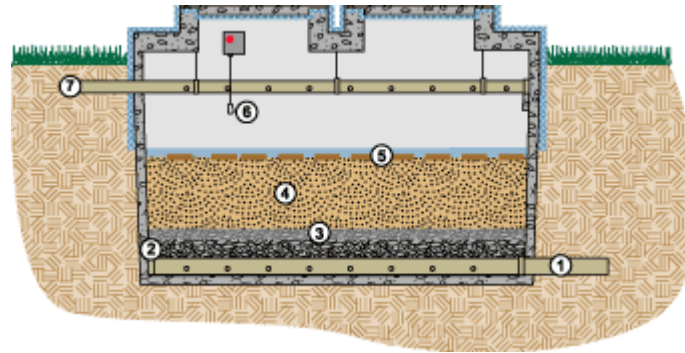
- The filter should be installed on a firm base and the access openings must extend a minimum of inches above final grade.

What You Will Learn in This Lesson

In this lesson, you will learn how the inside of a free access gravity sand filter must be constructed to meet the requirements of the DEP Alternate Systems Guidance (guidance).

In this lesson we will cover the requirements for the following:

- 1) Underdrain Pipe
- 2) First Layer of Aggregate
- 3) Second Layer of Aggregate
- 4) Sand
- 5) Splash Plates
- 6) High Water Alarm
- 7) Central Distribution Pipe



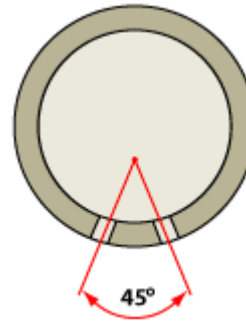
To help explain how the inside of the filter is constructed, we are going to use a set of diagrams to build the inside of the filter starting with the bottom and working toward the top.

1) Underdrain Pipe

The underdrain pipe collects the effluent after it has gone through the sand filter. This pipe must be **four** inches in diameter and have a minimum 2,500-pound crush test specification. The pipe will be placed at the bottom of the tank, so it must be strong enough to withstand the weight of the aggregate and sand. The pound crush test information is printed right on the pipe.

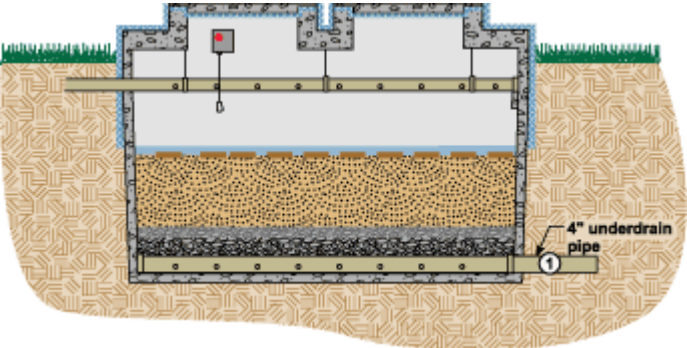
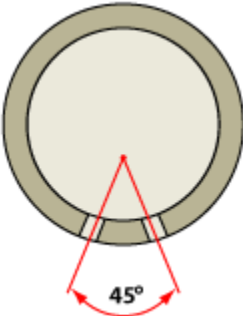
The pipe must have two rows of holes with diameters between 1/2 and 3/4 inch placed at six-inch intervals.

The pipe must be placed so that the holes face downward and the rows of holes are at approximately 45-degree angles from each other.



1) Underdrain pipe

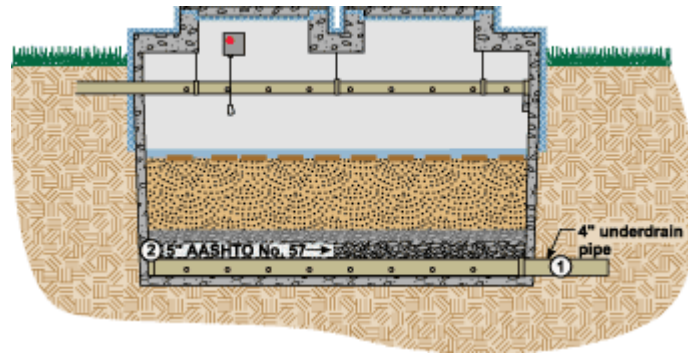
The diagram below shows the underdrain pipe inside of the filter. Note the location of the holes in the underdrain pipe. There is another set of identical holes on the other side of the pipe. All holes must be six inches apart on center.



2) First Layer of Aggregate

Let's continue to build the inside of the filter by adding the first layer of aggregate, **type B, AASHTO No. 57**. This is the same aggregate used in a conventional absorption area.

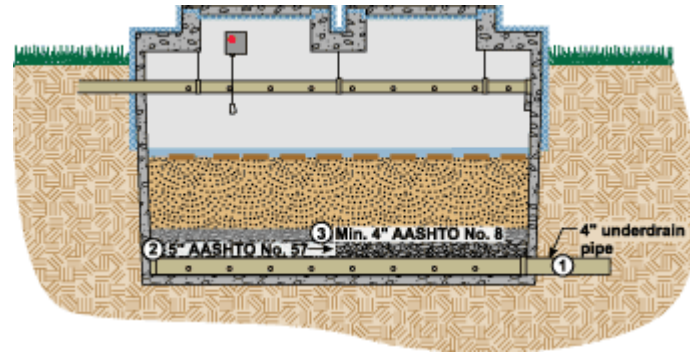
The aggregate must be placed around the underdrain pipe to a total depth of exactly **five** inches from the bottom of the tank. This means there will be one inch of aggregate above the pipe.



3) Second Layer of Aggregate

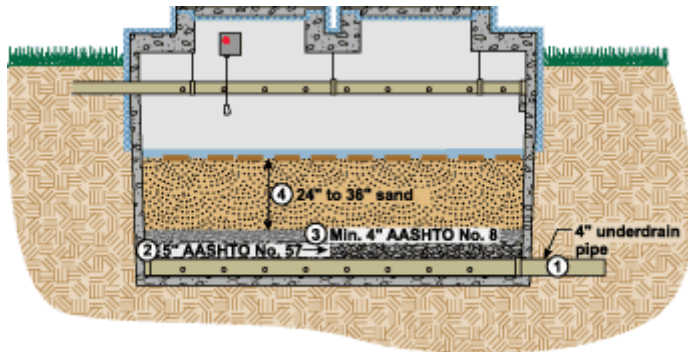
The second layer of aggregate must be **type B, AASHTO No. 8**. This aggregate is finer than the ASASHTO No. 57 and coarser than the sand. It provides a transition layer between the sand and the coarse aggregate.

The AASHTO No. 8 must be a minimum of **four inches** deep.



4) Sand

The sand is placed on top of the AASHTO No. 8 aggregate. It must meet the guidance requirements that were discussed in Lesson 1-2, and it must be at least **24** inches but not more than **36** inches deep.



5) Splash Plates

A splash plate made of concrete or another suitable material must be located under the central distribution pipe to prevent [scouring](#) of the sand surface when the effluent drops from the distribution pipe.

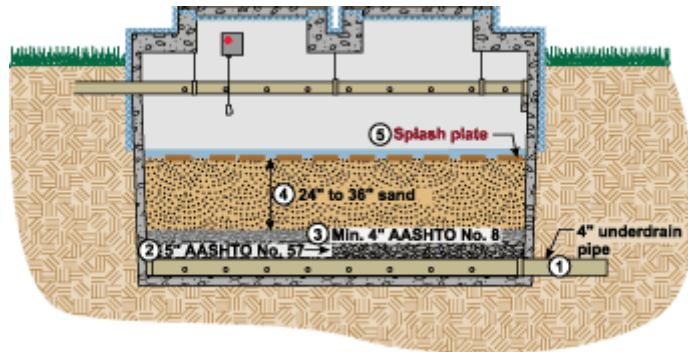
Another suitable material for the splash plates would be pressure-treated boards.

This picture shows pressure-treated boards being used as splash plates. The cement blocks hold the boards under the pipe, so they do not float out of place.



5) Splash Plates

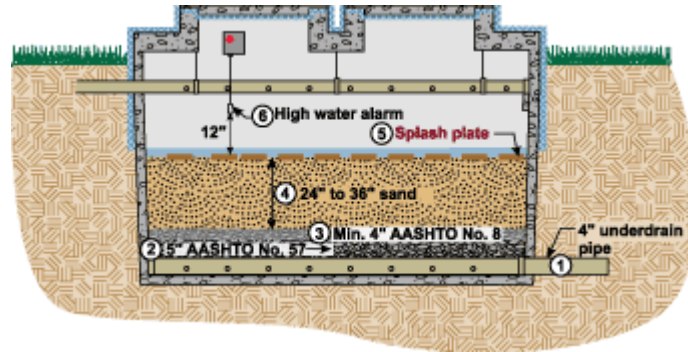
The splash plates sit on top of the sand and help prevent scouring of the sand surface.



6) High Water Alarm

A high water alarm must be installed in the filter to notify someone whenever there is a problem with the filter. The alarm must produce an audible and visual signal when effluent backs up in the filter 12 inches above the surface of the sand.

The alarm signal must be placed somewhere that people would see or hear it on a frequent basis.

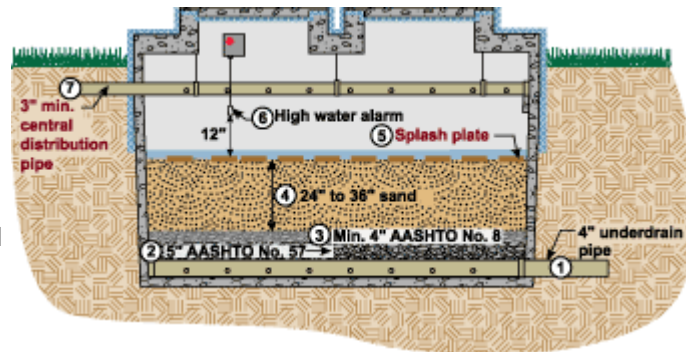


7) Central Distribution Pipe

The central distribution pipe carries the effluent over the sand surface. Effluent from the primary treatment tank enters the pipe where it fills up to the height of the holes before it is dispersed through the holes over the length of the center of the sand surface.

The central distribution pipe must be:

- 1) A minimum of 3 inches in diameter.
- 2) Installed level.
- 3) Placed high enough above the sand surface that a splash plate may be installed under the distribution pipe.

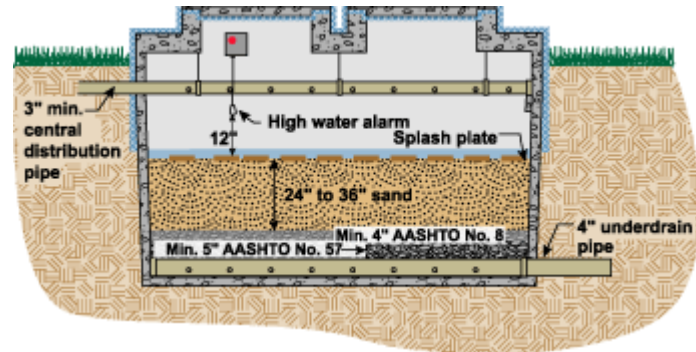


Review



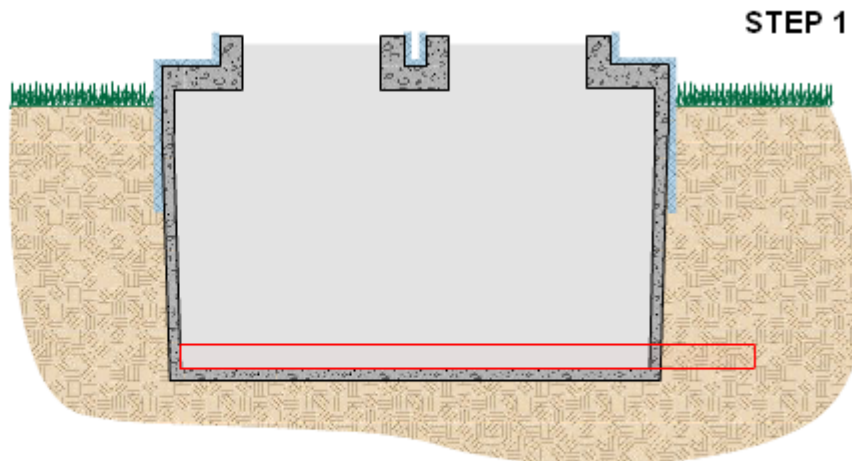
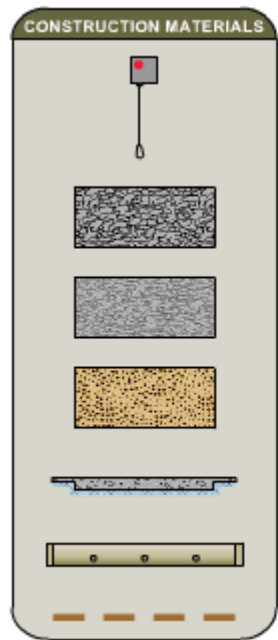
What is wrong in the diagram below?

- A) 24 to 36 inches of sand
- B) Min. 4 inches of AASHTO No. 8
- 8
- C) Min. 5 inches of AASHTO No. 57
- D) 4-inch diameter perforated underdrain pipe



Submit

Lesson Review

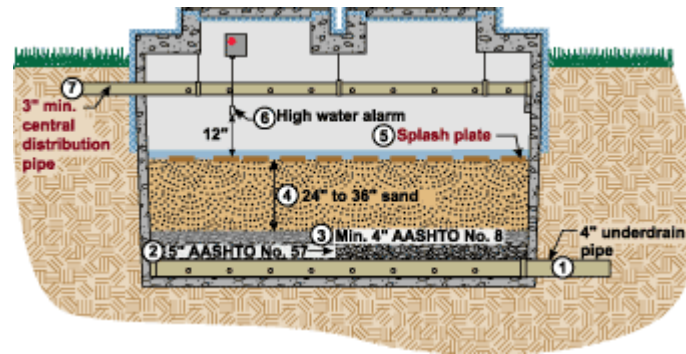


Drag and drop the appropriate construction materials from the toolbar area on the left to the correct position for each in the filter tank, building the free access gravity sand filter from the bottom to the top.

Lesson Summary

In this lesson, you learned how the inside of the sand filter must be constructed to meet the guidance requirements, specifically:

- 1) Underdrain Pipe - 4-inch diameter perforated
- 2) First Layer of Aggregate - exactly 5 inches of AASHTO No. 57
- 3) Second Layer of Aggregate - minimum 4 inches AASHTO No. 8



- 4) Sand - 24 to 36 inches
- 5) Splash Plates - made of concrete or other suitable material
- 6) High Water Alarm - engages 12 inches above sand surface
- 7) Central Distribution Pipe - 3-inch diameter minimum and level

What You Will Learn in This Lesson

In this lesson, you will learn about the six-month inspection that must be done on all systems using a free access sand filter. The lesson will also provide references to maintenance requirements for the individual residential spray irrigation system (IRSIS) and the alternate drip irrigation system using the sand filter.



Six-Month Inspection



Section 4.D

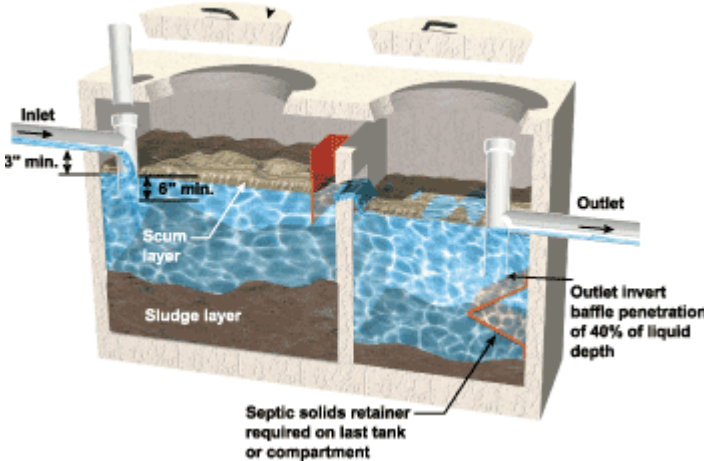
The six-month inspection must be done on all systems using the free access sand filter. The property owner or an entity responsible for doing the six-month inspection must check the structural integrity of the septic tanks, dosing tanks, lift pump tanks, and aerobic tanks. During the inspection, the items listed below must be inspected:

- 1) Inlet and outlet baffles
- 2) Solids retainer
- 3) Pumps and Siphons
- 4) Electrical connections

Six-Month Inspection

INLET AND OUTLET BAFFLES

During the 6-month inspection, the inlet and outlet baffles must be inspected to make sure they are not damaged.



Six-Month Inspection

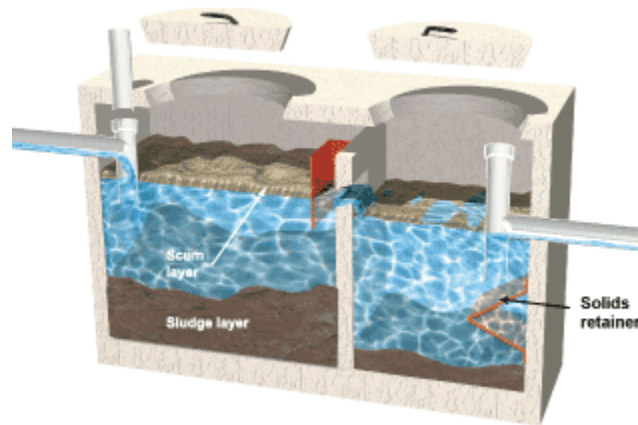
SOLIDS RETAINER

A solids retainer must be in place or the optional effluent filter may serve as the effluent filter and the solids retainer. If this is the case, the effluent filter must meet the definition of a solids retainer.



The optional effluent filter should be periodically cleaned as needed. Clean the filter according to the manufacturer's specifications.

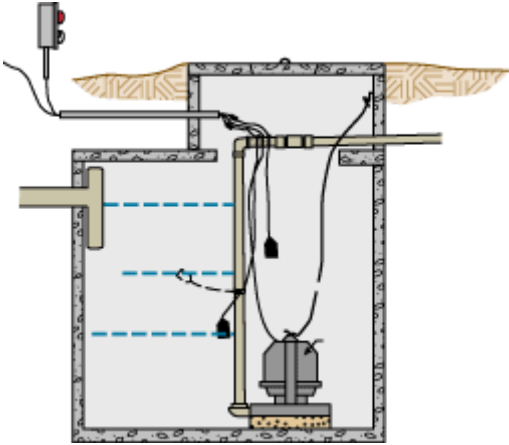
Click on the image below for a larger, more detailed view.



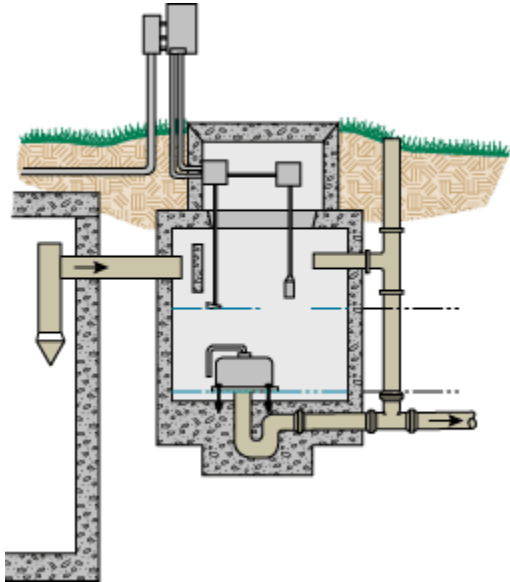
Six-Month Inspection

PUMPS AND SIPHONS

Check to make sure the pump or siphon is properly functioning. Manually run the pump or add water to the tank to check the siphon.



Pump



Siphon

Six-Month Inspection

ELECTRICAL CONNECTIONS

When inspecting the electrical connections, make sure the wires are sealed in a watertight environment and that no corrosion has occurred.

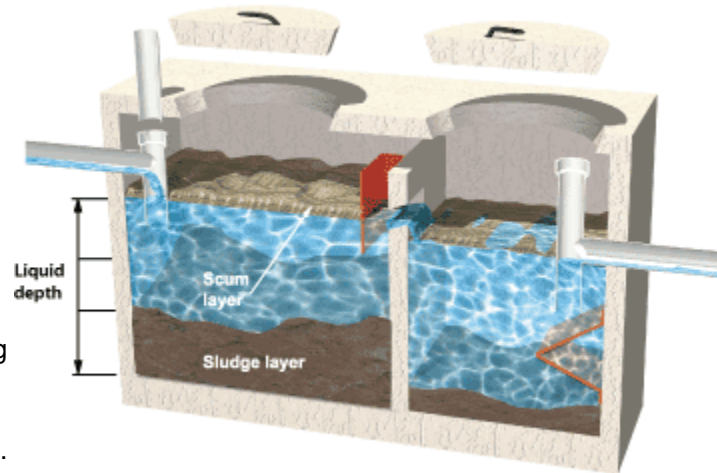
Six-Month Inspection

Aerobic Tank

The inspection and concurrent pumping of excess solids must be conducted in accordance with the manufacturer's and NSF requirements.

Septic Tank

The treatment tank(s) should be pumped on a regular basis. After a certain period of time, the [scum](#) and sludge layers become too thick and may allow solids to leave the tank. Solids that leave the tank may clog the sand filter and result in an excessive organic mat. Pumping the tank will remove these layers and prevent the solids from easily leaving the tank. Baffles and solids retainers should also be checked when the septic tank(s) is opened for pumping.



Six-Month Inspection

When the local agency has a maintenance program in place, the regulations require that the [septage](#) or other solids be removed from the treatment tank(s) once every **three years** or whenever an inspection program reveals that the treatment tanks are filled with solids or scum in excess of one-third of the liquid depth of the tank.

Even if the system is not part of a local agency's sewage management program, the DEP recommends that the tanks be pumped every **three years**.

IRSIS Maintenance



Section 73.167(2)(iii-vii)

Every month, the free access sand filter must be checked by the property owner and every six months, the system must be inspected by a maintenance entity when an IRSIS is being used. The inspection must cover the items listed in the regulations under Section 73.167(2)(iii-vii).

IRSIS Maintenance

MAINTENANCE ENTITY



Section 72.25(H)

The six-month inspection must be done by a maintenance entity established under Section 72.25 (h) of the regulations.

Drip Irrigation



Section 12.D

If a drip irrigation system is being proposed as the final treatment and disposal option with a free access sand filter, the operation and maintenance must comply with the applicable provisions of the DEP Alternate Systems Guidance Section 12.D.

Lesson Summary

In this lesson, you learned about the operation and maintenance requirements of the free access gravity sand filter.

- 1) A six-month inspection on all systems to check all the tanks in the system, including the filter tank.
- 2) A monthly and six-month inspection must be done when a free access sand filter is being used with an IRSIS. Refer to the regulations for maintenance specifications.

3) When a free access sand filter is being used with an Alternate Drip Irrigation system, refer to Section 12.D of the guidance for maintenance specifications.

