

3.2.7 Drainfield Cover

Drainfield cover consists of two components. These are the soil barrier and the soil placed over the soil barrier as final cover. There are several elements to consider for both components that are discussed below.

3.2.7.1 Soil Barrier

IDAPA 58.01.03.008.07 requires that drainfield aggregate must be covered throughout the drainfield by a soil barrier. For standard subsurface sewage disposal systems, standard absorption beds, and seepage pits the soil barrier may consist of untreated building paper, synthetic filter fabric (geotextile), or a 3 inch layer of straw or other acceptable permeable material. Other permeable materials proposed for use as a soil barrier will be considered on a case-by-case basis and must be approved by the health district prior to installation in the standard subsurface sewage disposal system. Although straw and untreated building paper may be used to cover ~~drainfield~~ drainfield aggregate, geotextiles of greater than 1 ounce per square yard weight are recommended. These materials are particularly recommended in soils that may flow when wet, such as uniform fine sands or silts ~~and in pressure distribution systems.~~

Soil barriers used for all basic and complex alternative systems not listed within IDAPA 58.01.03.008 should use geotextile filter fabric to cover the drainfield aggregate. Additionally, all large soil absorption systems shall also utilize geotextile filter fabric as the soil barrier (IDAPA 58.01.03.013.04.i). Some approved gravelless trench components used for drainfield aggregate replacement may not need to be covered with a soil barrier. The soil barrier requirements for each gravelless trench component should be based on the product manufacturer's recommendations.

3.2.7.2 Soil Cover

Every drainfield must have a soil cover installed after the system's installation and subsequent final inspection by the health district. The minimum depth of soil that must be placed over the top of a drainfield is 12 inches (IDAPA 58.01.03.008.04). The maximum depth of soil that may be placed over the top of a drainfield is 36 inches (IDAPA 58.01.03.008.04). These depths are intended to keep effluent from reaching the ground surface through the drainfield, mitigate the rise of nuisance odors from the drainfield, and allow oxygen to reach the drainfield and its surrounding soils.

Soil used to cover the drainfield should be the same as or one soil group finer than that of the native site material around and above the drainfield. Cover soil should be consistent with one of the approved soil design groups provided in Table 2-4. No soil finer than clay loam should be used as cover over the drainfield. All soil used as cover shall be free of debris, stones, frozen clods, and ice or snow.

Care should be taken to account for settling of the cover soil. Extra cover may be necessary to achieve the desired fill depth after the cover soil settles. All cover placed over the drainfield should be placed in a manner that prevents the blockage and accumulation of surface runoff over the drainfield. Cover that is placed above grade should not exceed a 3:1 slope. Mechanical compaction of the drainfield cover is not allowed and shall not be covered by any impermeable surface barriers (IDAPA 58.01.03.008.09).

3.2.8 Drainfield Excavation Backfilling Materials and Alternative System Construction Media

Installation of a drainfield or construction of several alternative systems requires that the drainfield excavation or alternative system be constructed with some type of media or aggregate. For any media used in a basic or alternative system it is important that the media or aggregate meet certain size and cleanliness specifications to ensure the system's functionality and longevity. To ensure proper media or aggregate sizing and material cleanliness it is necessary for the health districts to verify and inspect the media or aggregate installed in subsurface sewage disposal systems. Media and aggregate inspection and approval processes are discussed further below.

Upon excavation, native site soils are considered the same as fill material. For subsurface sewage disposal systems, excavation is considered any disturbance of the native site soils that causes the soil to lose its original compaction. Native site soils excavated for any portion of a subsurface sewage disposal system shall not be left in place or backfilled below a drainfield unless the material has successfully completed the evaluation process outlined in section 2.4. Scarification of soils as described in certain alternative system guidance is the only excavated native soil that is approved to be left below a drainfield. Scarification should only occur for the approved alternative systems in this manual that it is specified for. Manual raking of a drainfield excavation to alleviate soil smearing is not considered scarification.

3.2.8.1 Drainfield Aggregate and Construction Media Approval Process

Drainfield aggregate is any crushed rock or gravel that is durable, inert, free of fines, and has an effective diameter of ½ to 2 ½ inches (IDAPA 58.01.03.008.08). Construction media is considered any earthen material specified for use in the construction of an alternative system. The following construction media is currently specified for use in alternative systems:

- Medium sand (also referred to as ASTM C-33 sand)
- Pea gravel
- Pit run material (consisting of clean sand and gravel)

Aggregate and construction media must come from an approved source before installation in any subsurface sewage disposal system. To become an approved source a supplier (typically a material pit or storage yard) shall submit an annual sieve analysis for each source of drainfield aggregate or construction media that they would like to obtain approval for the purpose of installation in a standard or alternative subsurface sewage disposal system. The sieve analysis verifies compliance with material sizing and cleanliness specifications as specified in IDAPA 58.01.03.008.08 or verifies compliance with the recommendations for an approved alternative system (IDAPA 58.01.03.004.10). The sieve analyses from each source shall be submitted to the local health district for review and aggregate or construction media approval. Each health district shall maintain an approved source and materials list for their district and will provide a copy of this list to DEQ.

Health district approval of an aggregate or construction media source only provides verification that the source is capable of producing these materials in conformance with the material specifications. The health district may still disapprove drainfield aggregate or construction media

if it becomes contaminated during processing, loading, transport, storage, or installation either at the source location or at a subsurface sewage disposal installation site. It is the responsibility of those processing, providing, transporting, storing, or installing the aggregate or media to ensure the drainfield aggregate or construction media maintains its approved characteristics (i.e., size and cleanliness).

The size and cleanliness characteristics of drainfield aggregate and construction media shall be evaluated utilizing standard sieve analysis. The sieve sizing shall conform to the standards of the American Society for Testing and Materials (ASTM). The size and cleanliness characteristics for each material are provided below.

3.2.8.1.1 Drainfield Aggregate

Drainfield aggregate is commonly referred to as drainrock. The dimensions of this material are specified in IDAPA 58.01.03.008.08. The material is typically comprised of crushed rock or gravel and the rock or gravel is of a durable and inert type. Other materials meeting the size and cleanliness specifications may be considered for use as drainfield aggregate if it can be shown that the material is both durable and inert. Consideration of alternative drainfield aggregate sources will be made on a case by case basis. To determine if a drainfield aggregate is suitable it must be passed through a sieve to ensure that 100% passes a 2.5 inch sieve and that $\leq 2\%$ passes through a 0.5 inch sieve for size and less than 2% passes a #200 sieve for cleanliness (Table 3-3).

Table 3-3. Drainfield aggregate allowable particle size percent composition.

Sieve Size	Passing (%)
2.5 inch	100
0.5 inch	≤ 2
200	< 2

3.2.8.1.2 Medium Sand (will replace section 2.1.4)

The following definition may be used to determine if a soil texture construction media is a medium sand: the sand is passed through a sieve to ensure that it conforms to the gradation requirements of American Society for Testing and Materials (ASTM) C-33 for size and less than 2% passes a #200 sieve for cleanliness (Table 2-53-4).

A sand with a mean particle size (D_{50}) of no more than 0.5 millimeter (mm) and a coefficient of uniformity (C_u) of 8 or greater has been shown to sustain a biological mat and will be acceptable in systems under continual use.

Table 2-53-4. Modified ASTM C-33 medium-Medium sand (modified ASTM C-33) allowable particle size percent composition.

<u>Sieve Size</u>	<u>Passing (%)</u>
<u>4</u>	<u>95-100</u>
<u>8</u>	<u>80-100</u>
<u>16</u>	<u>50-85</u>
<u>30</u>	<u>26-60</u>
<u>50</u>	<u>10-30</u>
<u>100</u>	<u>2-10</u>
<u>200</u>	<u>≤ 2</u>

3.2.8.1.3 Pea Gravel

To determine if a construction media is pea gravel the media is passed through a sieve to ensure that it conforms to the gradation requirements of 100% passing the 1/8 inch sieve, less than 2% passing the #7 sieve, and that less than 1% passes the #50 sieve for size and cleanliness (Table 3-5). Additionally, the media must have a uniformity coefficient of less than 2.

Table 3-5. Pea gravel allowable particle size percent composition.

<u>Sieve Size</u>	<u>Passing (%)</u>
<u>1/8 inch</u>	<u>100</u>
<u>7</u>	<u>< 2</u>
<u>50</u>	<u>< 1</u>

Comment [TF1]: Call pits

3.2.8.1.4 Pit Run

Pit run construction media is composed of clean cobble, gravel, and sand. To determine if a construction media is suitable pit run it shall be passed through a sieve to ensure that it conforms to the gradation requirements of 100% passing a 10 inch sieve, 66-100% passing a #50 sieve and 2-10% passing a #100 sieve for size. Additionally, less than 2% shall pass a #200 sieve for cleanliness. See Table 3-6.

Table 3-6. Pit run allowable particle size percent composition.

<u>Sieve Size</u>	<u>Passing (%)</u>
<u>10 inch</u>	<u>100</u>
<u>50</u>	<u>66-100</u>
<u>100</u>	<u>2-10</u>
<u>200</u>	<u>< 2</u>

3.2.8.2 Substantiating Drainfield Aggregate and Construction Media Installation

After delivery of the drainfield aggregate or construction media to a subsurface sewage disposal system installation site the health district shall verify that the aggregate and/or media was obtained from an approved source as described in section 3.2.8.1. The permitted installer, property owner, or licensed public works contractor under the direction of a P.E. licensed in Idaho performing the subsurface sewage disposal system installation shall provide the drainfield

aggregate or construction media receipts to the health district for verification of source and volume (IDAPA 58.01.03.011.04). The health district shall record the volume of drainfield aggregate or construction media on the final inspection form for the installation permit. The volume of drainfield aggregate and construction media may also be used to verify the excavation depth of drainfield trenches.

Example (verification of excavation depth of an in-trench sand filter drainfield trench):

The drainfield covers a disposal area of 420 ft² and was installed with two 6 foot wide trenches that are each 35 feet long. The excavation depth of the system was required to be 7 feet with a drainfield installation of 4 feet. To meet the excavation depth and install the drainfield no deeper than 4 feet approximately 47 cubic yards of medium sand must be installed below the drainfield aggregate. Another 15.6 cubic yards of drainfield aggregate should be installed to ensure that a minimum of 12 inches of aggregate is in place and that it is installed no deeper than 4 feet. This is determined by:

Medium Sand Volume

$(420 \text{ ft}^2 \text{ of disposal area}) \times (3 \text{ ft. of medium sand}) = 1,260 \text{ ft}^3 \text{ of medium sand.}$

$(1,260 \text{ ft}^3 \text{ of medium sand}) / (27 \text{ ft}^3 / \text{yd}^3) = 46.67 \text{ yd}^3 \text{ of medium sand}$

Drainfield Aggregate

$(420 \text{ ft}^2 \text{ of disposal area}) \times (1 \text{ ft. of drainfield aggregate}) = 420 \text{ ft}^3 \text{ of drainfield aggregate.}$

$(420 \text{ ft}^3 \text{ of drainfield aggregate}) / (27 \text{ ft}^3 / \text{yd}^3) = 15.56 \text{ yd}^3 \text{ of drainfield aggregate}$