

4.12 Gravelless Trench System

Revision: October 23, 2012

4.12.1 Description

A gravelless trench system meets all the requirements of a standard trench system except that the drainrock is replaced by an approved gravelless trench component (section 5.7). Typical components include gravelless chambers, large diameter nylon fabric wrapped piping of varying dimensions, and drainrock substitution systems. Gravelless trench systems are allowed a reduction in trench bottom square footage due to the reduced masking of infiltrative surface. The reduction is only allowed in trench designs up to 36 inches in width. No reduction is allowed for installation widths greater than 36 inches, or for installation in sand mound designs.

4.12.2 Approval Conditions

1. Unless otherwise noted, the system must be installed according to the gravelless trench component manufacturer's recommendations.
2. An approved septic tank effluent filter (section 5.9), based on manufacturer's recommendations may be installed at the septic tank outlet for basic drainfield applications (pump chamber and extended treatment system applications are exempt from this approval condition).
- ~~3.~~ Reduction in square footage cannot be in addition to other allowable disposal area reductions (i.e., drainfield reductions due to increased application rates for treatment).

4.12.3 Design

1. Length of pipe-gravelless trench product needed should be calculated on the following basis:
 - a. 8-inch diameter pipe = 2-ft²-effective area Disposal trench length is determined by the application rating for each product (section 5.7, table 5-5, rating column).

Example (large diameter pipe):

- i. Product selected has a rating (square feet of application area per linear foot) of 1.33 ft²/ft. based on one pipe per trench installation (see Section 5.7, table 5-6, for application rates based on the installed width of the product such as two pipes per trench).
- ii. 3 bedroom home (250 GPD) in soil design subgroup B-1 soils (application rate of 0.6 gallons per day/square foot)
- ~~i-iii.~~ ([250 GPD]/[0.6 GPD/ft²])/(1.33 ft²/ft.) = 314 linear feet of gravelless trench product

Example (gravelless chamber):

- i. Product selected has a rating (square feet of application area per linear foot) of 4.0 ft²/ft

- ii. 3 bedroom home (250 GPD) in soil design subgroup B-1 soils (application rate of 0.6 gallons per day/square foot)
- ~~i.iii.~~ $([250 \text{ GPD}]/[0.6 \text{ GPD}/\text{ft}^2])/(4.0 \text{ ft}^2/\text{ft}) = 105 \text{ linear feet of gravelless trench product}$

b. 10-inch diameter pipe = 3 ft-effective-area Disposal trench length is calculated the same way for both gravelless pipe and gravelless chamber products (attention must be paid to specific product application ratings). Gravelless pipe application rate will increase if installed in a side-by-side application (refer to Section 5.7, table 5-6, rating column based on installed product width).

~~b.c.~~ Width of trench is dependent upon the manufacturer's installation requirements for each approved product.

~~2. Effective area is equivalent to trench bottom area.~~

Example: ~~A three-bedroom home (250 GPD) on a site with sandy loam soil (soil design subgroup B-1, 0.6 GPD/ft²) would require 209 linear feet of 8-inch pipe ($[250/0.6]/2$) or 139 linear feet of 10-inch pipe ($[250/0.6]/3$).~~

- 2. Individual lines in soil design group C soils should be as long as possible, not exceeding the 100-foot maximum.
- 4. ~~An inspection port/sludge sump should be installed at the end of each line.~~

4.12.4 Construction

- 1. The trench should follow the contour of the land, ~~and the pipe should be installed between 18 and 36 inches below the surface.~~
- 2. Trench excavations should not be less than ~~18~~12 inches wide and no more than 36 inches wide. Width dimensions will be dependent upon the manufacturer's installation instructions.
- 3. Pipe must be installed level with an allowable variation of not more than one-half inch per 100 feet. A transit, engineer's level, or surveying station is required.
- 4. An inspection port/sludge sump should be installed at the end of each line.
- 5. Large diameter gravelless pipe products should be covered with geotextile fabric, untreated building paper, or a 3 inch layer of straw unless the product has a built in filter fabric in the design.
 - a. Gravelless chambers are not required to be covered with geotextile fabric, untreated building paper, or straw unless specifically required by the manufacturer.
- 6. Care must be taken not to over-excavate trench width wider than the product width
 - a. If over-excavation is unavoidable hand backfilling of trench should be performed up to the product height and fill should be walked in to ensure sidewall support of the product.

~~*Note: Gravelless domed chamber systems are awarded a 25% reduction in size if arranged in trenches. No reduction is allowed for bed or sand mound designs.*~~