

## Mound and Area Fill Study Guide

This study guide was written to supplement the information in the On-Site Sewage Management System Manual concerning mounds and area fill systems. It does not replace the manual. Therefore, it is necessary to study the information in the manual in order to do well on the certification test. [page B-1 paragraph 4A, pages F-13 through F-32, page H-1, pages H-7 through H-10 and Appendix O-II page 1-7]. The certification test will not cover how to design the piping layout for a pressure dosed system. However, you should read this section in order to get a general idea of how pressure dosing works.

There are two basic types of systems that use fill materials; the Wisconsin Mound Soil Absorption System [mound system] and the area fill system. Both are similar in design and installation; however the main differences are noted below.

### Wisconsin Mound System

1. Sewage must be distributed into the mound by a pressure dosing system only.
- 2A. The side slope of the mound system must be a minimum of 3 to 1. [For every foot of height in the mound the fill must taper out three feet.
- 2B. The fill must be sloped at a 3 to 1 ratio starting at the absorption area out.
3. The design loading rate of 1.0 gallon per day per square foot (1.0 gpd/ft<sup>2</sup>), which assumes a coarse grain sand, is used to size the absorption area.
4. The mound's absorption area can consist of either a gravel bed or trenches.

### The Area Fill System

1. Sewage can be distributed into the area fill either by gravity or by a pressure dosing system.
- 2A. The side slope of the area fill system must be a minimum of 5 to 1. [For every foot of height in the area fill system the fill must extend out 5 feet].
- 2B. The absorption line must be at least 5 feet off the shoulder of the sloped area.
3. Sizing of the absorption area in the area fill system is based on the most restrictive texture encountered within the top twelve inches of original soil.
4. The area fill system's absorption area must consist of trenches. A gravel bed can not be used.

**The main similarities between the mound system and the area fill system are noted below.**

1. Both systems' fill material must meet ASTM C-33 specifications for fine aggregate with less than five percent passing a number two hundred sieve. This is coarse sand so no loams or clays can be used. Even using sandy fill material that has excessive amounts of silt and clay can cause failure of the systems.

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2. Fill materials other than ASTM C-33 sands may be acceptable provided they pass the falling head permeability test procedure found in the manual or other Department approved ASTM testing procedures.
3. Care must be used to construct both the mound system and the area fill system. If the site is not properly plowed to prevent formation of a barrier between the fill and natural soil or the natural soil becomes compacted then either system could experience failure.
4. Both systems must comply with all set backs from wells, bodies of water and other features as do conventional gravel septic systems.
5. Both systems have similar restrictions on the use of absorption trenches. [see page H-1 Table HT-1]

**Some causes of failures of both mound systems and area fill systems are noted below.**

1. Overloading of the systems due to excessive water use or ground water infiltration.
2. Overestimating the infiltration rate and hydraulic conductivity of the natural soil during design.
3. The natural soil being compacted during construction or not being plowed properly.
4. The use of fill sand that has excessive amounts of silt and clay.