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Septic tank installation and construction

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Quick Facts

- When laying out a septic tank-leachfield system, the septic tank should be located so it is accessible from the driveway to the home; this facilitates servicing the tank later.
- Poor construction practices affect the ability of the soil in an absorption field (using trenches) or in a seepage bed to accept wastewater.
- Excavation for a septic tank-leachfield system should not take place if the soil moisture content is too high and the surfaces of the soil being excavated will be smeared considerably.
- Obtaining a natural soil condition in the trench or seepage bed is difficult when using heavy construction equipment; it requires extra concern on the part of excavating personnel.
- After construction is completed, the landscaping should be designed to prevent heavy vehicular and livestock traffic in the area of the leachfield.

would be required. Landscaping may have to be modified to accommodate a pump truck.

Trenches versus Seepage Beds

Poor construction practices mainly affect the ability of the soil in an absorption field (using trenches) or in a seepage bed to accept the wastewater. At the time of the percolation test, the site normally is undisturbed. During construction of the home, the area designated for the leachfield (or seepage bed) should not be disturbed. Heavy equipment should definitely not be permitted on the leachfield area as this compacts the soil. Such compaction tends to reduce the ability of the soil to accept wastewater and may cause the system to eventually overload and fail.

Construction practices may influence whether a trench or a seepage bed type of leachfield is chosen. Since a trench usually is not over three feet (.9 meter) wide, it is dug without having heavy equipment down in the trench. A seepage bed, on the other hand, generally is large enough to permit excavation equipment to operate on the bed. If a seepage bed is used, heavy equipment should not be permitted on the bottom of the bed even though it is easier to excavate with the equipment on the bed.

In addition to the above construction problems with seepage beds, it has been recognized that seepage beds do not have the sidewall area that trenches do. The sidewall area has been found useful in the absorption process, thus making trench type leaching fields more desirable. This fact has been recognized in recent proposed changes in the state guidelines for septic tank-absorption field regulations.

Normally, a homeowner contracts to have an on-site sewage disposal system installed. The majority of contractors installing systems perform good work; however, it always is wise to be certain that your system is installed according to standard, accepted practices. This Service in Action sheet will briefly review some major construction considerations of which a homeowner should be aware. This will assure the proper installation of an on-site system and, therefore, minimize future problems with the system.

Soil Moisture During Construction

Excavation should not take place if a handful of the soil can be rolled easily into a wire or thread between your hands. This indicates the soil moisture content is too high and the surfaces of the soil being excavated will be smeared considerably. A surface smeared during construction tends to seal itself and will not permit water to be absorbed as planned in the design.

Construction practices vary widely from state to state and even between communities in a state. Thus, the following comments deal with general aspects of construction and not specific details.

Septic Tank Location

When laying out the septic tank-leachfield system, the septic tank should be located so it is accessible from the driveway to the home. This is desirable from the standpoint of servicing (pumping) the septic tank after the landscaping is completed. Pump trucks do have hoses that can reach a considerable distance away from the driveway and if it is not possible to locate the system near the driveway, a homeowner may want to check with a local pumper to see how much distance

If soil is friable or dry, it will fall apart when you attempt to roll it. In this case, the soil is suitable for construction. The argument often is given that it is okay to construct in wet soil since subsequent freezing and thawing will reestablish pore spaces. Soil at the bottom of a leachfield trench or seepage bed will not

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freeze and, consequently, once smeared or compacted it will remain in that condition.

Excavation

The bottom of the soil treatment area (trenches or seepage bed) must be excavated level across the width and throughout the length. The soil surfaces—bottom and sidewalls—that are to be exposed to the crushed rock or gravel fill should be in as natural a condition as possible. Avoid smearing excavated vertical trench walls. The natural condition has the sidewalls rough with the natural soil profile exposed.

Obtaining a natural soil condition in the trench or seepage bed is difficult when using heavy construction equipment. To achieve the natural condition requires extra concern on the part of the excavating personnel.

Gravel Base

After the trench is completed, clean rock or gravel fill ranging in size from $\frac{1}{2}$ inch to $2\frac{1}{2}$ inches (1.3 to 6.4 centimeters) is placed in contact with the bottom and sidewalls of the soil treatment area. The depth of rock varies with local regulations, however, 9 to 12 inches (22 to 30 cm) generally is recommended. The rock fill permits the water to reach the entire soil surface in the trench and helps prevent root growth in the distribution pipe.

The distribution pipe—four-inch (10-cm) perforated plastic pipe with holes at least one-half inch (1.3 cm) in diameter—is placed on the gravel fill and then covered with two inches (5 cm) of additional gravel. The gravel fill is then covered with straw or untreated building paper to prevent fine soil from clogging the gravel pores.

Final Cover

The final fill in the trenches is made with soil to a depth of at least eight inches (20 cm), and no more than 24 inches (61 cm) is recommended. The depth of cover soil should be adequate to protect against physical damage to the system, to protect against freezing and to provide opportunity for evaporation and transpiration.

The amount of backfill should be sufficient to account for future settling. There should not be any low areas over the trench as this will allow surface water to stand and overload the absorption area.

After the construction of a system is completed, the landscaping should be designed to prevent heavy vehicular and livestock traffic in the area of the leachfield system.

Summary and Conclusions

On-site home sewage disposal construction practices vary among installers; however, there are some basic considerations that all home builders, installers and homeowners should observe. The leachfield site should not be disturbed prior to installation. The installer should not use construction practices that tend to compact the soil or smear soil surfaces (the exposed soils surfaces should be left natural). The trench (or bed) bottoms should be level and the gravel and piping installed according to county regulations. The septic tank should be accessible to pumping equipment and the entire system should be properly covered and protected.

A discussion of the above points with the installer before construction begins may help reduce potential problems.