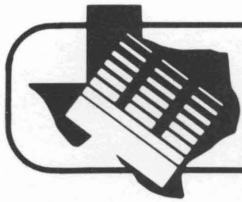


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Texas Agricultural Extension Service

Septic Tank-Soil Absorption Systems

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Households not served by community public sewers often depend on septic tank-soil absorption systems to treat and dispose of wastewater. The septic tank removes most settleable and floatable solids from the wastewater; the soil absorption system filters and treats the clarified septic tank effluent. By removing most solids, the septic tank protects the soil absorption system from clogging and premature failure. To work properly, the septic tank needs periodic maintenance.

In Texas, soil absorption systems can be used in areas where the percolation rate of the soil is between 5 and 60 minutes per inch (soil permeability between 1 and 12 inches per hour), and there is at least 4 feet of suitable soil to provide adequate treatment of the septic tank effluent. The soil absorption system must be at least 150 feet from a water well, and 10 feet from the property line, right-of-ways, and the house. Septic systems cannot be placed on the flood plain and are limited to areas with less than a 30 percent slope.

Septic Tank

A septic tank is a watertight container constructed of a sound, durable material resistant to corrosion or decay. Septic tanks must have two compartments or use two single chamber tanks in series.

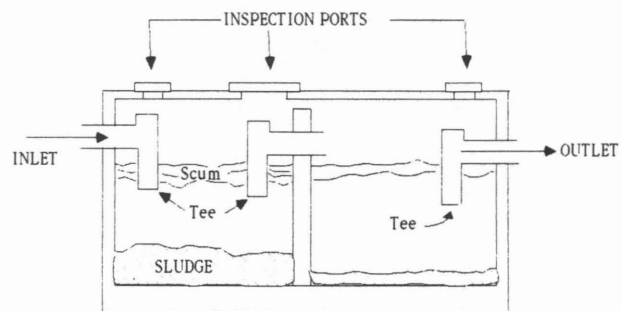
Among the most important components of a septic tank are the baffles or "Tee" fittings. The inlet baffles force wastewater down into the tank, preventing short-circuiting across the top. The outlet baffle keeps the scum layer from moving out of the tank and into the soil absorption system. Septic tanks have inspection ports for checking the condition of the baffles and a manhole for cleaning the tank.

The selection of the capacity of the septic tank is based on the size of the house. In Texas, a 750-gallon

tank is required for a home with one or two bedrooms. For a three-bedroom home a 1000-gallon tank is required. A 1250-gallon tank is required for 4 bedrooms and 250 gallons of tank capacity are required for each additional bedroom.

Soil Absorption System

The soil absorption system receives effluent from the septic tank and filters and treats the effluent before it enters the groundwater. At least 4 feet of unsaturated soil is needed above a limiting layer. A limiting layer may be bedrock, an impervious soil layer, a seasonally high water table (grey soil or mottles), or permanent water table.



Cross Section of Two Compartment Septic Tank

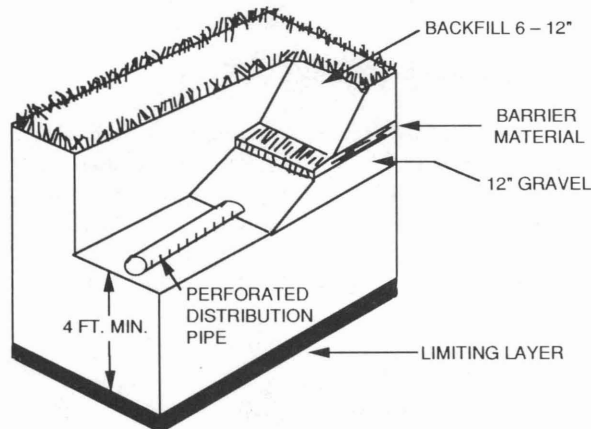
The soil absorption system is a bed or a set of trenches 18 to 36 inches deep, with trenches 12 to 36 inches wide, and placed at least 3 trench widths apart. The maximum length of a bed or trench is 75 feet. The bottom of the bed or trenches must be level and constructed to follow the contours of the lot.

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Lateral distribution lines in soil absorption systems should have a diameter of 3 to 10 inches in the case of perforated pipe (used in gravity systems) or 2 inches with drilled holes (used in pumped or pressure-dosed systems). The latter distribution pipe should be placed inside a gravel envelope of 12-inch thickness. The top of the gravel is covered with geotextile fabric or another approved barrier before the system is backfilled with native cover soil. This prevents the soil particles from moving down into the gravel. The cover soil should be mounded to account for settling. The area should be graded to avoid ponding of rainwater, and seeded with grass to prevent erosion.

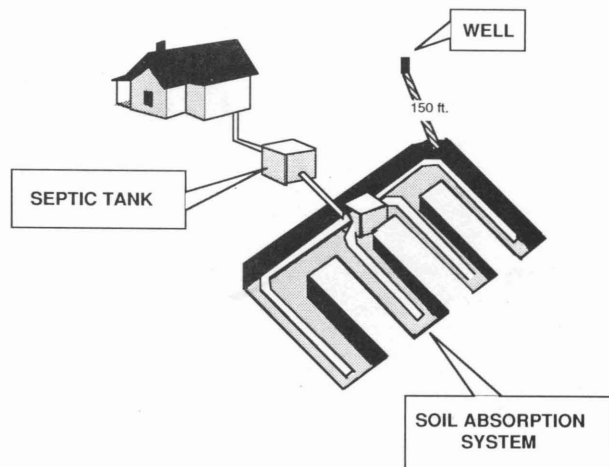
The size of a soil absorption system is based on the size of the house and the percolation rate of the soil. For a three-bedroom home the yard area needed for the absorption trench or bed could range from 2,000 ft² for a soil percolation rate of 5 minutes per inch to nearly 7,500 ft² for a percolation rate of 60 minutes per inch. This provides only the minimum area for the soil absorption system. The set-backs from the water well and lot lines must also be taken into account.



Trench Soil Absorption System

Wastewater Distribution

In Texas, septic tank effluent may flow by gravity to the soil absorption system or it may be pumped. While pumped systems have been shown to have a longer life, the pump and pump chamber must be purchased and maintained. Serial distribution systems are usually used with gravity fed units on sloping ground.



Schematic diagram of a septic tank-soil absorption system

State Standards

Standards for construction of on-site sewage treatment systems have been adopted by the Texas Department of Health, which is involved in enforcing these standards in counties that have not adopted a septic tank ordinance.

Things To Watch Out For

- Keep heavy equipment off the soil absorption system area both before and after construction. Soil compaction can result in premature failure of the system.
- Divert rainwater from building roofs and paved areas away from the soil absorption system. This surface water will increase the amount of water the soil has to absorb and cause premature failure.
- Make sure the perforated pipes are level to provide even distribution of the septic tank effluent. If settling and frost action cause shifting, part of the soil absorption system may be overloaded.
- Avoid installing the septic tank and soil absorption system when the soil is wet. Construction in wet soil can cause puddling, smearing and increased soil compaction. This can greatly reduce soil permeability and shorten the life of a system.
- Install water-saving devices. Water conservation can greatly reduce the amount of water going into the soil absorption system and extend its useful life.
- Have the septic tank pumped and inspected regularly.

For more information on septic tank soil absorption systems contact the local health department or your county Extension office.

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