



Septic Systems - How do they work ?

Septic systems are wastewater treatment systems that collect, treat, and dispose of wastewater generated by homes and businesses on site as opposed to public sanitary sewers which carry wastewater off site to be treated and disposed of. A conventional septic system consists of two main parts, a primary treatment unit (septic tank), which normally has a minimum capacity of 1000 gallons, and a soil absorption unit (lateral field) which consists of number of trenches for wastewater distribution. This type of septic system is the most widely used.

With the conventional system, wastewater from the home flows into the septic tank. As solids enter the tank they fall to the bottom where the bacteria in the tank begins the breakdown to a liquid called effluent. Approximately fifty percent of the solids are changed into liquids and gases. The effluent contains all of the liquid from your wastewater, which often includes bacteria, viruses, and other contaminants. The septic tank should have a minimum detention time of 24 hours for proper treatment of the wastewater. This treatment of effluent in the tank is called anaerobic treatment.

This breakdown causes the sewage to separate into three layers within the septic tank. The bottom layer consists of large solids or sludge which is slowly digested by bacteria. The middle layer consists of relatively clear water containing minute particles. The upper layer consists of floating solids or scum.

Baffles or tees within the tank cause the sludge and scum layers to be retained for future treatment and storage, while the middle layer, or clear zone, is discharged to the secondary treatment portion of the system. In the typical conventional system, this would be the lateral field.

Septic systems cannot dispose of all the material that enters the tank. Solids that are not broken down by bacteria begin to build up in the septic tank and eventually need to be removed. The most common reason for system failure is not having these solids removed on a regular basis.

A conventional system normally utilizes gravity to disburse the wastewater. When the effluent (liquid only) reaches the level of the outlet pipe it will flow from the septic tank where it enters a distribution box. The distribution box directs the effluent to the individual lateral lines. The distribution box is utilized to control the flow of the effluent being disbursed to each line. Once the effluent passes through the distribution box and into the lateral trench it is absorbed into the soil where it receives a secondary treatment by air and microorganisms. This form of treatment would be aerobic treatment. During times of excessive water usage by the household, the soil in the drain field can become waterlogged which reduces its capability to treat the effluent. If the soil is continuously over saturated, it will eventually cease to perform as a filtering and treatment element for the wastewater.

The lateral field is composed of several trenches, as determined by the original site evaluation performed on the property before the construction of the home or business. However, keep in mind that over time, additions and alteration to the system could have been installed. The laterals can be composed of gravel trenches with perforated piping, as is the case of rock laterals or can be of manufactured material such as polyolefin resins as in the case of chambers.

When site conditions are not suitable for a conventional system, alternate systems can be designed, engineered, permitted, and installed to handle the wastewater needs at most any location. Some of the alternate systems are mound, wetland, lagoon, or low-pressure. All of these systems utilize a septic tank, however, the secondary treatment and disbursement differ.

Other options may include an aeration system for spray or direct discharge. This type of system does not utilize the standard septic tank as it operates on an aerobic treatment (oxygen using) providing a more extensive treatment of wastewater than the typical anaerobic (no oxygen) septic tank.

As with any septic system, proper maintenance is a must to keep operation and function at its maximum performance