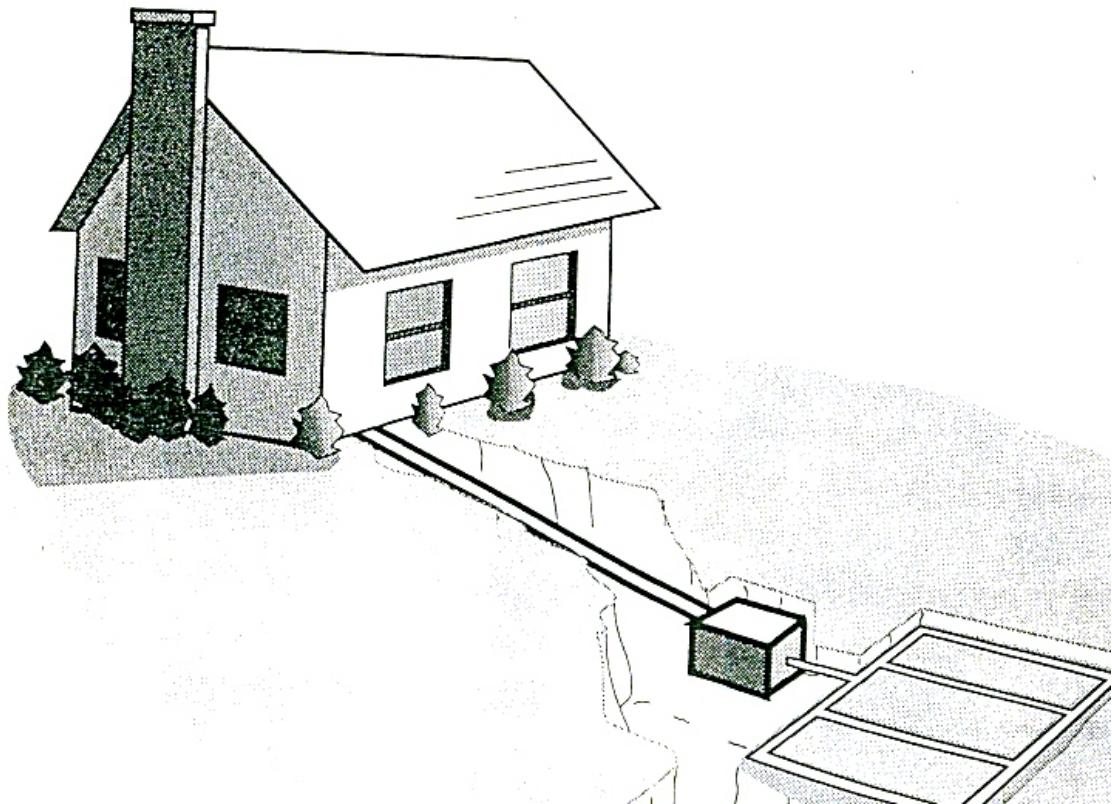


INSTALLING A SEPTIC SYSTEM IN LIVINGSTON COUNTY



INSTALLING A SEPTIC SYSTEM

IN LIVINGSTON COUNTY

LIVINGSTON COUNTY PUBLIC HEALTH DEPARTMENT

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Figures taken from the
1986 Private Sewage Disposal Licensing Act and Code
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If you are planning to install a septic system in Livingston County there are some things that you should know about the construction, governing laws, inspection process and maintenance. You should be aware of the different types of systems and how big they should be to handle the amount of sewage that will be generated. You should also be aware of the laws governing private sewage disposal and your responsibility to the environment. Hopefully, we will answer your questions about all phases of private sewage disposal.

First and foremost you will need to know that the system you plan to install is regulated by state law. The Illinois Department of Public Health sponsors these regulations as stated in the *Private Sewage Disposal Licensing Act and Code* and the Livingston County Public Health Department enforces the laws in this area. Only the homeowner or a licensed contractor is authorized to install a private septic system with the assistance of the county health department.

A permit application must be obtained from the Livingston County Public Health Department for the installation, repair, any additional construction or extra load applied to a system. Subsurface seepage fields shall be sized on the number of bedrooms in the residence and the permeability of the soil. Soil permeability shall be determined by a soil investigation conducted by a licensed soil classifier. Application rates shall be determined by using the chart which is part of the permit application.

The number of bedrooms in a home (or the estimated usage per employee in gallons per day for commercial establishments) will be the determining factor for tank size. If the system will contain a garbage disposal the tank must be larger or two tanks in a series is recommended.

A sanitarian will help you fill out the application, explain the procedure and if necessary assist with the percolation test and planning of the system.

Now that the application has been obtained and you, as a homeowner and county resident know your responsibility, it is time to choose the type of system that will meet your needs. There are many different designs for differences in soil types, in topography and the amount and type of sewage that will be generated.

HOW IT WORKS

A septic tank contains two major components: the septic tank and the absorption field. The septic tank is usually made of concrete, fiberglass, or plastic and is buried and watertight. All septic tanks should have baffles (internal slabs or tees) at the inlet and outlet to insure proper flow patterns. Most septic tanks are single compartment, but a number of states require multi-compartment tanks or two tanks in a series.

The size of the tank varies depending upon the number of bedrooms in the home. The primary purpose of the septic tank is to separate the solids from the liquids and to promote partial breakdown of contaminants by bacteria. The solids, in the form of sludge that collects on the bottom of the tank, and scum, which floats on the top of the water, remain in the tank and are pumped out periodically.

The wastewater is passed on to the absorption field through a connecting pipe. The absorption field is also known as the soil drainfield, the disposal field, or the leachfield. The absorption field contains a series of underground perforated pipes that are commonly, but not always, connected in a closed loop system.

The wastewater is distributed to the entire absorption field through the perforated pipes. The absorption field, which is located in the unsaturated zone of the soil, treats the wastewater through an aerobic (oxygenated) digestion process and filters the remaining impurities (germs and chemicals) before the wastewater returns to the groundwater.

The wastewater (effluent) coming out of the septic tank is a cloudy liquid that still contains many disease-causing germs and pollutants. When this water flows into the perforated pipe in the absorption field, the effluent exits through the holes in the pipe and trickles throughout the rock or gravel where it is stored until it is absorbed by the soil. In some systems, subsurface chambers store the effluent. As the effluent enters and flows through the unsaturated soil, many of the bacteria that can cause diseases are filtered out. Some of the smaller germs, such as viruses, are trapped and held by the soil molecules (absorbed) until they die. The soil can retain certain nutrients such as phosphorus and some forms of nitrogen.

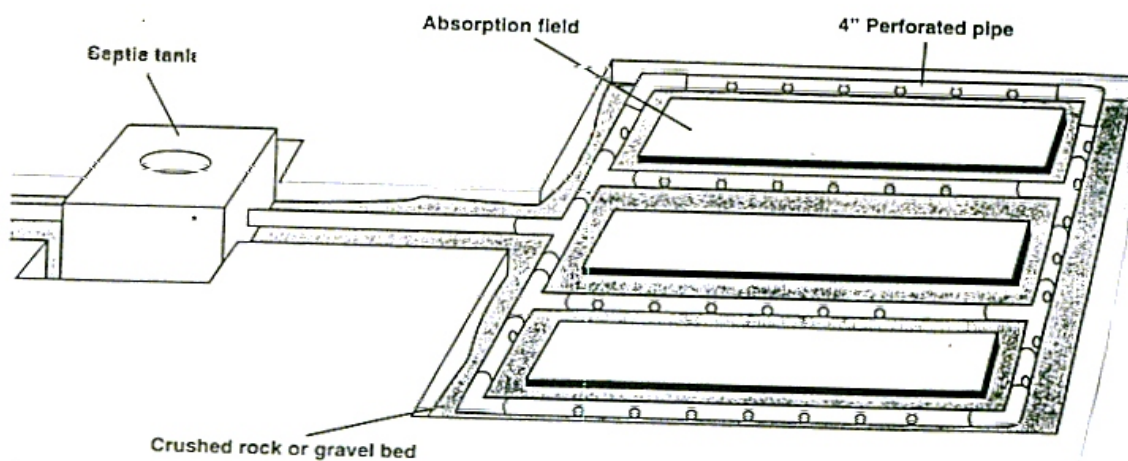
SUBSURFACE SEEPAGE SYSTEMS

CONVENTIONAL GRAVEL SYSTEM

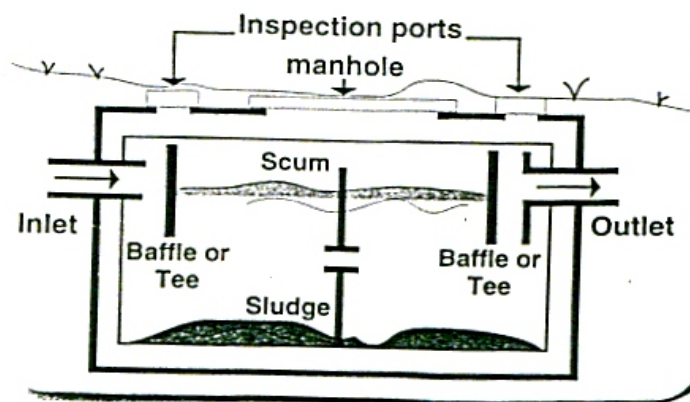
This is the most common system used on level land with adequate soil depth above the water table. Liquid flows from the septic tank through a closed pipe into a perforated pipe and into trenches where it seeps into the soil.

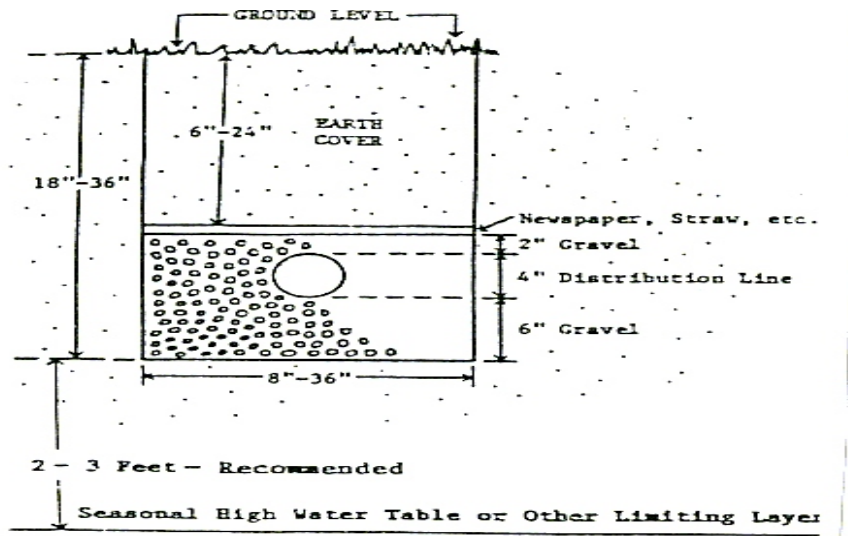
This system uses trenches containing a perforated tile surrounded by gravel and topped with a layer of porous material such as newspaper, building paper or straw before backfilling. This helps keep the soil from clogging the spaces between the rocks which are needed for effluent.

Following is an illustration of a typical conventional gravel system and the minimum dimensions required by law.



Cross section of a two-compartment septic tank





STANDARDS FOR GRAVEL SEEPAGE FIELD CONSTRUCTION

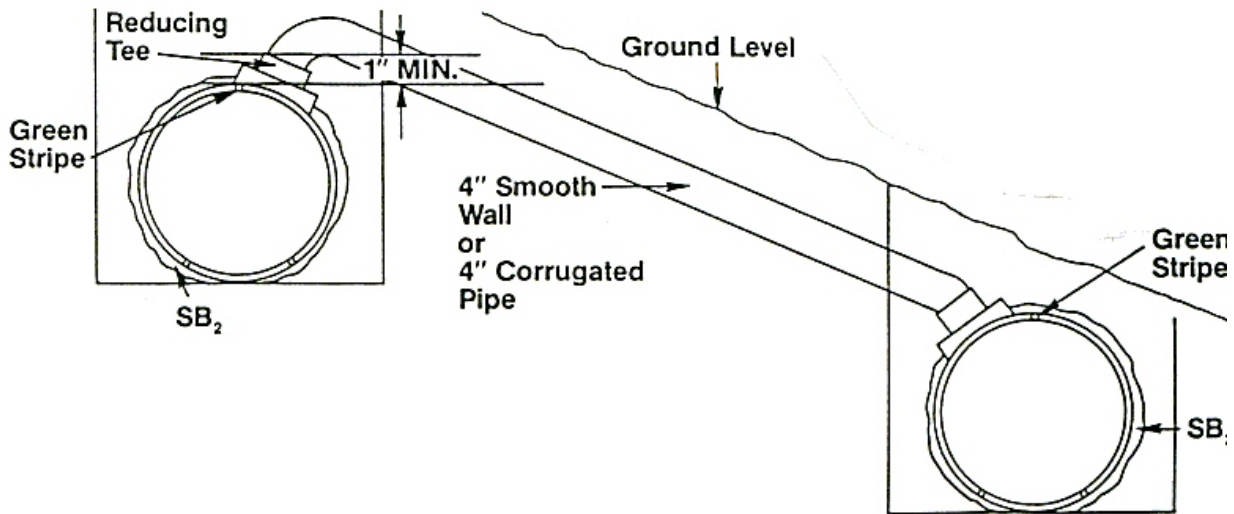
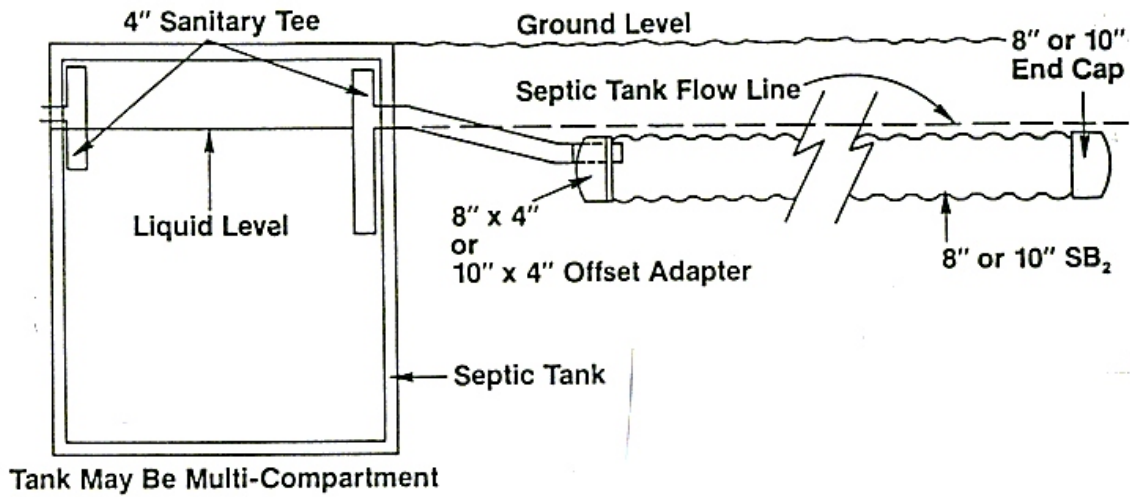
- Trench Length, maximum length 100 feet
(From point of discharge into seepage trench)
- Trench bottom, minimum width 8 in.
- Trench bottom, maximum width 36 in.
- Trench bottom, minimum depth 18 in.
- Trench bottom, maximum depth 36 in.
- Trench bottom, slope level
- Distribution line, minimum diameter 4 in.
- Distribution line, minimum earth cover 6 in.
- Distribution line, maximum earth cover 24 in.
- Distribution line, maximum slope level

Width of Trench at bottom	Minimum Center To Center Spacing of Distribution Lines	Effective Absorption Area Per Linear Foot of Trench
Inches	Feet	Square Feet
8	6.0	0.67
12	6.0	1.0
18	6.0	1.5
24	6.0	2.0
30	7.5	2.5
36	9.0	3.0

GRAVEL-LESS SYSTEM

Gravel-less pipe is available in both 8 and 10 inch diameter corrugated polyethylene tubing with specially designed perforations encased in factory installed protective wrap. The protective wrap provides a soil interface for the passage of effluent into the soil.

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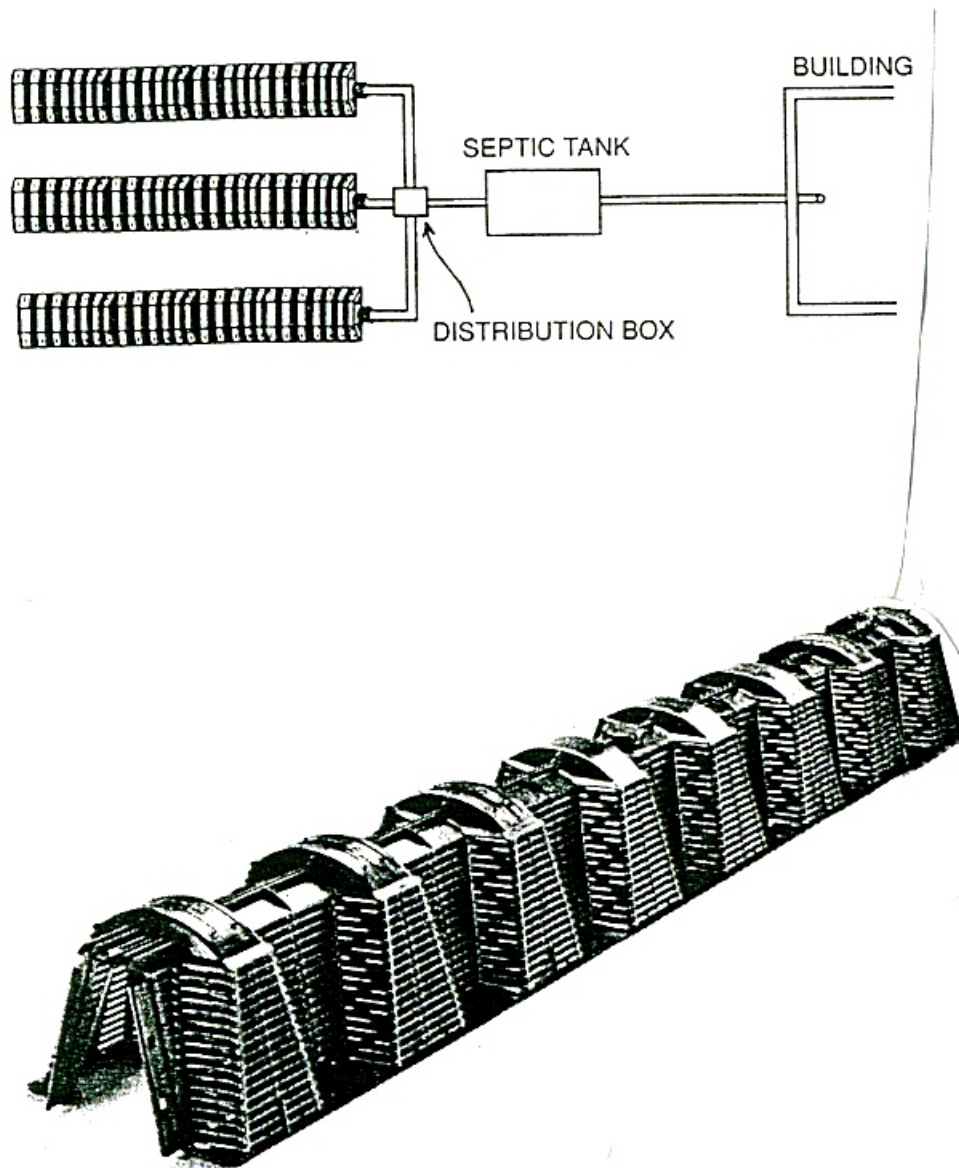
STANDARDS FOR SEEPAGE FIELD CONSTRUCTION (GRAVEL-LESS)

Trench Length, maximum	100 feet
Trench Bottom, minimum width	18 inches
Trench Bottom, maximum width	24 inches
Trench Bottom, minimum depth	18 inches
Trench Bottom, maximum depth	36 inches
Trench Bottom, slope	level
Distribution Line, minimum inside diameter	8 inches
Distribution Line, maximum inside diameter	10 inches
Distribution Line, minimum earth cover	6 inches
Distribution Line, maximum earth cover	24 inches
Distribution Line, maximum slope	level

Inside Diameter of Gravel-less Drainfield	Minimum Center to Center Spacing of Distribution Lines	Effective Absorption Area Per Linear Foot of Trench
8 inches I.D.	7.0	2.0
10 inches I.D.	7.0	3.0

CHAMBER SYSTEMS

Open bottom arched chambers create an underground cavern that stores effluent. The effluent floods the soil surface prior to seeping vertically through the bottom of the chamber.



ALTERNATIVE WASTEWATER SYSTEMS

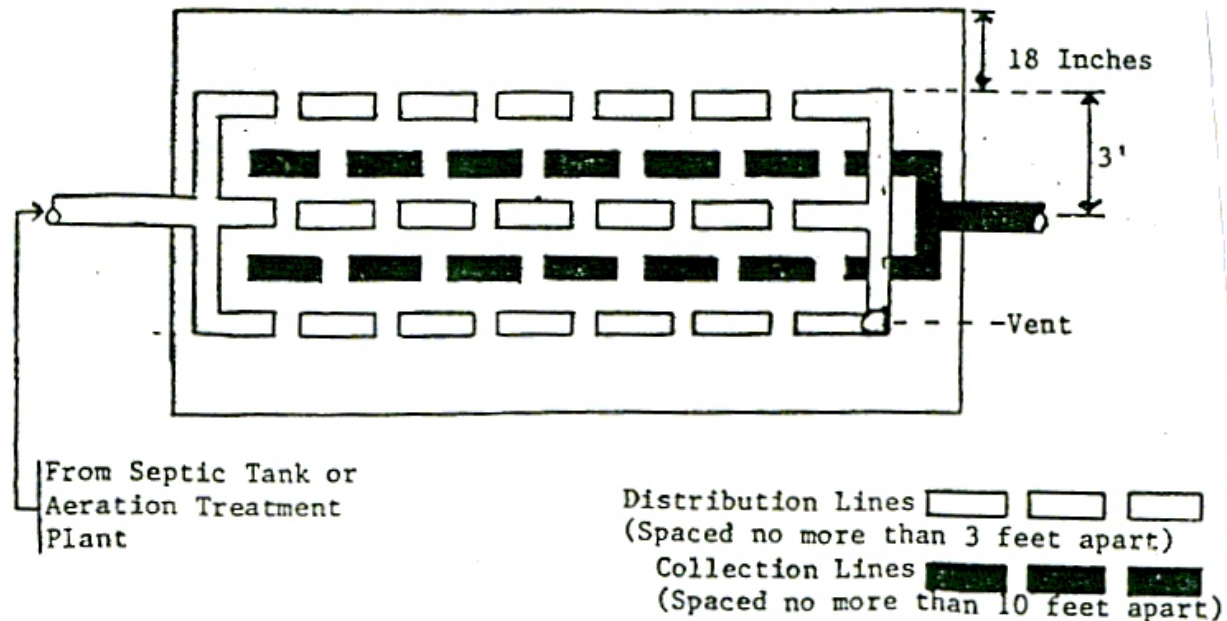
Pretreatment addresses the need to treat higher strength waste and can help repair biologically overloaded systems where no additional absorption area is available. Aerobic treatment systems and filters can be used for this purpose. For aerobic treatment (called "Package Plants"), wastewater and air mix in a tank. Bacteria grow in the tank and break down the waste. For filters, septic tank effluent passes over porous media that trap the solids. Bacteria that grow in the media break down the waste.

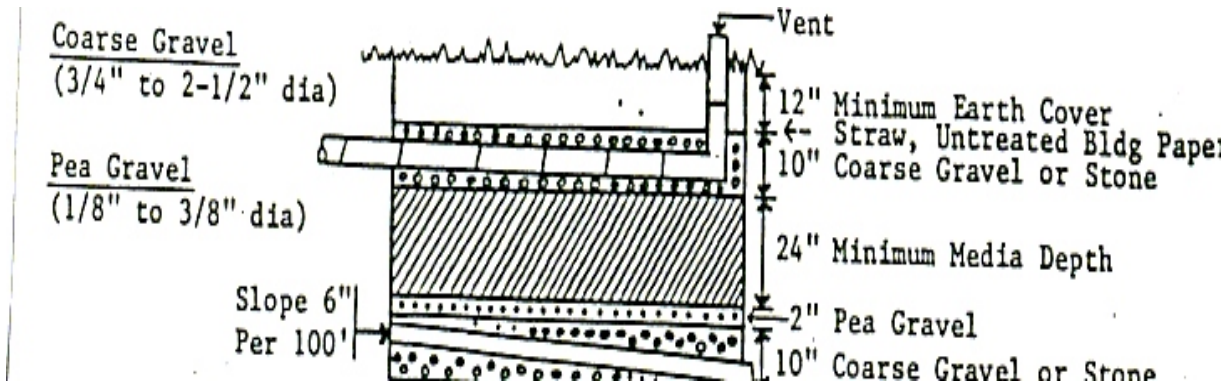
SAND FILTER

A sand filter may be used when the soil has very slow permeability as an alternative to a conventional subsurface seepage field. It consists of an excavated area filled with sand adjacent to the outlet pipe. A series of collection pipes receive the sewage and a series of distribution pipes distribute it throughout the sand bed and allow the sand to absorb and cleanse the effluent. At the opposite end of the bed is a discharge tile equipped, generally, with a chlorinator. The clear water discharge emitted from the system, if any, is chlorinated and runs into a creek or other body of water.

The size of the bed, sand, and chlorinator are regulated by law and subject to inspection.

A recirculating sand filter works on the same principle; however, the bed is smaller and devices are installed to recirculate the effluent until it is absorbed or the discharge is clean.

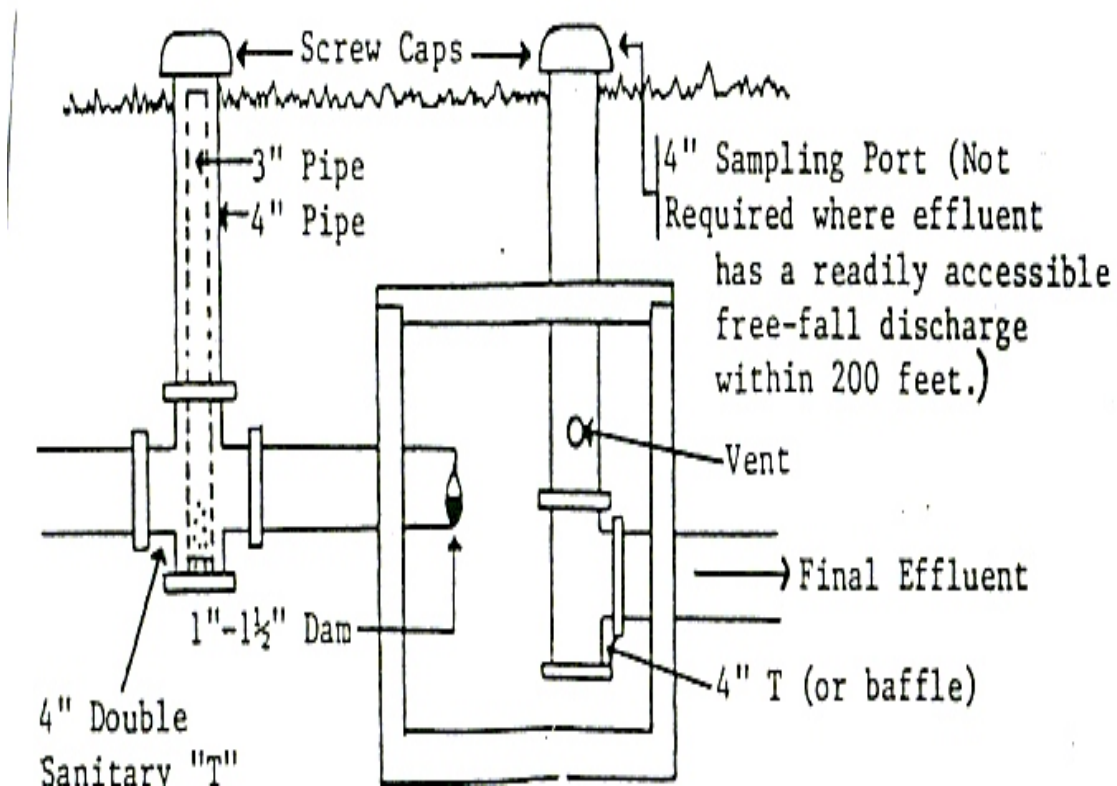




AEROBIC TREATMENT PLANT

If a family is very large or a rural commercial building employs many people or conditions are unfavorable for another type of system, a small treatment plant may be utilized.

These units are a small-scale version of a municipal sewage treatment plant. A small rural subdivision may share one of these systems. They can be costly to install and must be monitored. If you believe this type of system may meet your needs, contact a sanitarian at the Livingston County Public Health Department for more information.



Once the permit application is completed and the type of system has been chosen, the permit application must be brought in for approval before the excavation begins. A drawing of the conceived system must accompany the application. The drawing must include north, relevant distances and any other pertinent information.

A sanitarian will review the diagram and, if necessary, help you make corrections. Once the application is approved, the permit is issued.

When the system has been installed, either by you or a licensed contractor, prior to backfilling a sanitarian must be notified that the system is ready for inspection.

The inspection will include measuring all distances for the purpose of making a scale drawing, so that the system can be found later on for maintenance and repair purposes. Any constructional flaws found in the system at the time of the inspection that would impair its ability to function properly must be corrected before approval of the system is granted.

The purpose of these inspections is not to infringe on private property but to insure that the homeowner will have a system that will meet his/her needs and function as designed. It will also insure that the sewage disposal will not harm or burden the surrounding environment any more than necessary.

SEPTIC SYSTEM MAINTENANCE

A new septic tank does not need any chemical additives. Read the labels on such products to avoid overdosing the system or wasting money on something the tank does not need.

Avoid flushing diapers, sanitary products and other foreign materials that the tank is not designed to digest.

To keep from overloading the tank, direct clear water discharges elsewhere. These include cooling water, ground water, footing or roof-drain discharge, swimming pool waste water, air conditioner condensation lines and water softeners.

Also, those with garbage disposals should be aware that the system can clog from excessive amounts of grease, grit, organic matter and toxic waste. A bigger tank or two tanks in a series may help, but exercise caution and do not overdo it.