Volume 1, Issue 2

July 2006

WWC News

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Septic and Drain Field Systems *A Basic Overview*

Septic Systems

- What, Why, Costs, & Considerations
- Design: Getting Started
- Installation

What, Why, Costs, & Considerations

The leading cause of waterborne disease is contaminated drinking water. This problem arises from inadequate or the absence of septic systems. This problem is minimized in the United States and most other developed nations because our public health departments regulate new construction in order to keep our drinking water clean. Almost all new buildings will require some means of transporting wastewater offsite, and if you can't connect to city sewer lines then you are going to have to build your own septic system.

Typical septic systems consist of a pipe running from the indoor plumbing to an underground septic tank, which allows all solid waste to sink and be digested by bacteria, or pumped at a later date. Typical septic tanks are concrete and have a capacity of at least 1,000 gallons. Liquids move on from the tank to an underground drain field of either perforated PVC pipe surrounded by gravel, or plastic vaults (i.e., infiltrator chambers) with a soil floor. The new vault system costs a bit more than the traditional gravel system, but it allows for a smaller drain field and seems to be preferred by most homeowners, contractors, and health inspectors. The average septic system costs between $2,000 and $4,000.

Design: Getting Started

It is important to first talk to your county health department and pick up a packet of forms and information describing the specific process they would like you to use. Next, choose a certified contractor and designer. In order to size your system you will need at least two test pits, 5-7 feet deep for the county health department to examine. Based on the soil type and number of bedrooms in your house, the soil type can tell you how big your drain field needs to be.

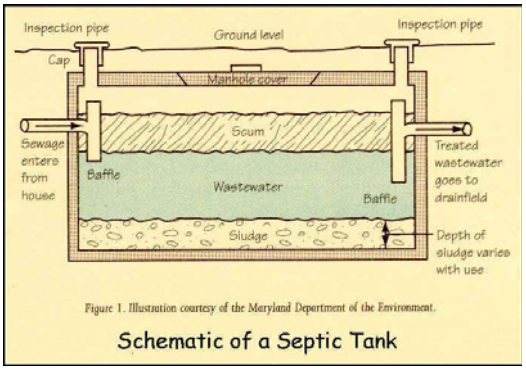

Figure 1. Illustration courtesy of the Maryland Department of the Environment.

Schematic of a Septic Tank

The septic tank and drain field should be located down slope from the building. This allows gravity to do all of the work. If this is not possible, due to a flat site, or other considerations, you will need to install a more expensive pump system. At this point, you must make a choice between either the traditional drain

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WWC Engineering (WWC) is a full service corporation that has been serving the Rocky Mountain region since 1980. WWC's range of consulting services is broad and our corporate experience is extensive. With over 70 employees and offices in Sheridan, Laramie, and Casper, Wyoming and Helena, Montana, we have an exceptional staff of professionally licensed engineers, hydrologists, surveyors and geologists with a full complement of highly skilled field technicians, CADD specialists and clerical staff. WWC prides itself on producing the highest quality of work for our clients in a time-and-cost-efficient manner.

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rock, or the newer vault type drain field. Drain fields are required to have at least two trenches. To accomplish this, a distribution box is needed, which will divide the line coming from the septic tank into two or more separate lines. A detailed design drawing of your design and some paperwork will need to be submitted to the county health department for inspection. Pending approval, let the digging begin!

Installation

- ◊ Mark out the locations of the septic tank and drain field trenches as accurately as possible according to your plan. You may need to locate the property corner pins.
- ◊ Using a backhoe, dig out the trenches and a place for the tank. The trenches are generally three feet wide, three feet deep, and must be completely level. The length depends on what the health department deemed necessary for adequate drainage.
- ◊ The septic tank is positioned so that the pipe running into it from the house is between a slope of 1/8" drop per foot or 1/4" drop per foot.
- ◊ Installation of the drain rock type drain field consists of placing a layer of special gravel or "drain rock" one foot deep along the bottom of the trench. Filter fabric and perforated PVC piping are then stacked on top of the drain rock. If using vaults, no gravel is needed, simply assemble the interlocking plastic pieces together on the bare soil. These systems must be completely level in order to work as they are designed to.
- ◊ Connections between the pipes, septic tank, distribution box, and vaults must be done with care to avoid trouble spots. There should be no 90 degree turns in the piping, instead, use two 45 degree elbows, which allow for the system to be cleaned should a clog form.
- ◊ The health inspector must check the system before it can be backfilled. Once the inspection is complete, you may carefully backfill and compact over the system. When finished, where should be a bit of a hump, over the trenches to allow for settling.

The above discussion about septic systems is only a brief overview. You should always contact the county health department and/or a consultant before you begin any work. Putting a plan together right the first time can save you time and money and possibly regulatory compliance problems.