TOWN OF OXFORD

Board of Health

325 Main Street, Oxford, MA 01540
Phone (508) 987-6045 ext. 4
Fax (508) 987-3934
boh@oxfordma.us

SOIL AND PERCOLATION TESTING INFORMATION

Traditional septic systems only work if the soil in the leach area is sufficiently permeable that it can readily absorb the liquid effluent flowing into it. Also, there must be at least a few feet of good soil from the bottom of the leach pipes to rock or impervious hardpan below, or to the water table. The specific standards vary from town to town, but any of these characteristics can prohibit the use of a standard gravity-fed septic system. In some cases, a more expensive alternative septic system may be allowed. To determine is a building site is suitable for a septic system, a percolation test (typically called a "perc test' or "perk test") is required.

NO PERC, NO HOUSE

On rural sites without municipal sewage systems, a failed perc test means that no house can be built — which is why you should make any offer to purchase land contingent on the site passing the soil and perc tests. As prime building sites become increasingly scarce (or prohibitively expensive) in many parts of the country, rural sites that will not pass a percolation or perc test are increasingly common.

In general, soils with high sand and gravel content drain the best and soils with a high clay content or solid rock are the worst. Most soils fall somewhere in the middle with a mix of course sand and gravel particles, small silt particles, and miniscule clay particles – the smallest. To get a rough idea before investing time and money in testing, dig below the top few inches of topsoil (loam) to the lighter soil beneath. If you can take a handful of the damp subsoil and roll it into a thin, flat shape or worm shape that holds together, and it had a sticky firm texture, the soil has a high clay content and will probably fail a standard perc test.

The two main tests used to determine a site's suitability are a soil evaluation and percolation or perc test. Testing requirements vary greatly from state to state and often from town to town, as most states allow individual towns to establish separate rules within state guidelines. So, make sure you talk to your town health officer about what tests are needed, when they can be done, and who should perform them. Whether or not a licensed professional is required, it is a good idea to hire a seasoned expert with local experience as many of these tests have a bit of wiggle room.

DEEP HOLE TEST

Most tests start with a deep hole test dug by machine to well below the bottom of the proposed leach field – often 7 to 10 feet deep or greater. Soil samples may be taken back to the lab, or a visual test of soil layers may be sufficient. Soil tests (or observations) are used to identify the drainage characteristics of the soil, and the seasonal high water table is identified by examining splotches of color or "mottling" in the soil indicating the presence of water. The soil types, high water table, and depth of rock or impermeable hardpan are documented.

While most soil experts believe they have enough information at this point to design an effective septic system, most states today also require perc testing to directly measure the rate at which water percolates through the soil. The test measures how fast water drains into a standard-sized hole in the ground. The results determine whether the town will allow a septic system to be installed, and system designers use the results to size the leach field.

PERC TESTING

To conduct a perc test, first talk to the local health department official as requirements can vary significantly from town to town as far as who can conduct the test, the minimum number of holes, depth of holes, required absorption rates, and when the tests can be performed. In general, tests cannot be conducted in frozen or disturbed soil, and some areas only allow tests during certain months of the year – so plan ahead.

A standard septic system will only work if the soil is sufficiently permeable to water, as determined by a "perc" test. If the test fails, you may need a more expensive alternative system –or the site may be unbuildable.

TEST PROCEDURE

A typical perc test consists of three or more holes dug about 30 to 40 feet apart in the proposed drain field area (see illustration). The holes are typically 6 to 12 inches in diameter and two feet deep, the typical depth of the trenches in a leach field. Two inches of clean sand or gravel are placed in the bottom of the hole. Since the perc test is meant to simulate the actual conditions in a working septic system, the soil is then "pre-soaked" for several hours.

Next, the technician fills each hole with water to a depth of 6 inches above the gravel and measures how much the water drops in 30 minutes (or less for highly permeable soil that drains quickly). The times are carefully documented and used to

calculate the percolation rate – the time it takes for the water to fall one inch. This is usually expressed in minutes per inch of drop. A rate of 60 minutes per inch, meaning the water dropped one inch in 60 minutes, is often the cutoff point for a standard gravity-flow septic system, although the number varies from 30 to 120 minutes in other states. Some towns require that a town official be present to witness the test.

Test results are usually good for two to five years, and in some cases can be renewed. However, with all things perc, rules vary greatly from town to town so don't make any assumptions. Always check with the town health department before proceeding.

OPTIONS IF SITE FAILS

Even if your site fails a perc or deep-hole test, all is not lost. For sites with high water tables, you may be able to "de-water" the leaching area by strategically placing gravel-filled trenches and subsurface drainpipe to conduct water away from the drain field. You will need a highly experienced earthwork contractor, and possibly the help of a civil engineer or geotechnical engineer, to make this work.

Also, a wide range of **alternative septic systems** have been developed in recent years for use on almost any type of site. Find out which systems are approved for use in your area and which might be suitable for your site. In general, these systems cost more and many require pumps, alarms, and other components that require more monitoring and maintenance than a standard septic system. As these become more common and more widely accepted, formerly unbuildable lots may suddenly become approved building lots. As with all new building technology, however, look at products and systems with a proven track record in the field.