

Appendix A Procedures for Soil Determination and Material Acceptability

A Soil Borings - where soil borings are required, they shall be made as follows:

1. Each boring or excavation shall be made to a sufficient depth to provide the required design information.
2. A soil texture description shall be recorded by depth and notations made where texture changes occur.
3. Measurements shall be made to determine the depth to the limiting factor. This includes the highest notable water table by recording the first occurrence of redoximorphic features observed in the boring or excavation.

B Percolation Tests - where percolation tests are required they shall be made as follows:

1. Test hole dimensions and locations:
Each test hole shall be 6 to 8 inches in diameter, have vertical sides, and be bored or dug to the depth of the bottom of the proposed individual sewage treatment system.
2. Preparation of the test hole:
The bottom and sides of the hole shall be carefully scratched to remove any smearing and to provide a natural soil surface into which water may penetrate. Remove all loose material from the bottom of the hole. Add 2 inches of clean rock or sand in a mesh bag to protect the bottom.
3. Soil Saturation and swelling:
The hole shall be carefully filled with clear water to a minimum depth of 12 inches over the soil at the bottom of the test hole and maintained for no less than 4 hours and preferably overnight.
The soil shall then be allowed to swell for at least 16 hours, but no more than 30 hours. In sandy soils, the saturation and swelling procedure shall not be required and the test may proceed if filling of the hole has seeped away in less than 10 minutes.
4. Percolation rate measurement:
 - a. In sandy soils, adjust the water depth to 8 inches over the soil at the bottom of the test hole. From a fixed reference point, the drop in water level shall be measured in inches to the nearest 1/8 inch at approximately 10 minute intervals. A measurement can also be made by determining the time it takes for the water level to drop 1 inch from an 8 inch reference point. If 8 inches of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 8 inches. The test shall continue until 3 consecutive percolation rate measurements vary by a range of no more than 10%.
 - b. In other soils, adjust the water depth to 8 inches over the soil at the bottom of the test hole. From a fixed reference point, the drop in water level shall be measured in inches to the nearest 1/8 inch at approximately 30 minute intervals, refilling between measurements to maintain an 8 inch starting head. The test shall continue

until 3 consecutive percolation rate measurements vary by a range of no more than 10%. The percolation rate can also be made by observing the time it takes the water level to drop 1 inch from an 8 inch reference point if a constant water depth of at least 8 inches has been maintained for at least 4 hours prior to the measurement.

5. Calculating the percolation rate:
 - a. Divide the time interval by drop in water level to obtain the percolation rate in minutes-per-inch.
 - b. Percolation rates determined for each test hole shall be averaged to determine the final soil treatment system design.
6. For reporting the percolation rate, worksheets showing all calculations and measurements shall be submitted.
7. A percolation test shall not be run where frost exits below the depth of the proposed soil treatment system.

C Jar Test – Clean Sand

1. Place 2 inches of sand in the bottom of a quart size glass jar and then fill the jar 3/4th full of water.
2. Cover the jar and shake the contents vigorously.
3. Allow the jar to stand for 30 minutes and observe whether there is a layer of silt or clay on top of the sand.
4. If the layer of these fine particles is more than 1/8 of an inch thick, the sand is not suitable for use in mound construction, because too many fine particles tend to cause the soil to compact during constructions and future operation. Also, long-term acceptance rate of this soil will be slower than the long-term acceptance rate of clean sand, which is used for sizing the absorption bed area.

D Jar Test –Drain field Rock

1. Fill a quart sized glass jar nearly full with rock and then fill with water.
2. Cover the jar and shake the contents vigorously.
3. Allow the jar to stand for 30 minutes and observe whether a film forms on the surface or if fines collect on the bottom of the jar.
4. There should be less than 1/16-inch of fines in the bottom of the jar. If the measured fines layer is 1/16-inch or greater, a sieve analysis needs to be run (#200 sieve wash) to determine if the rock is acceptable or not.