

Robert A. Taft Method of Soil Percolation Testing

The percolation test shall be conducted utilizing the hole preparation, soil saturation and rate measurement procedures outlined in the U.S. Department of HEW, Public Health Service Manual of Septic Tank Practice (Robert A. Taft Sanitary Engineering Center Procedure). These procedures are summarized below and in Diagram 3 in Appendix A.

A. Saturation and Swelling of the Soil: It is important to distinguish between saturation and swelling. Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a short period of time. Swelling is caused by intrusion of water into the individual soil particles. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged soaking period.

B. Pre-soak: In the conduct of the test, carefully fill the hole with clear water to minimum depth of twelve (12) inches over the gravel. In most soils, it is necessary to refill the hole by supplying a surplus reservoir of water, possibly by means of an automatic siphon, to keep water in the hole for at least four (4) hours and preferably overnight. Determine the percolation rate twenty-four (24) hours after water is first added to the hole. This procedure is to insure that the soil is given ample opportunity to swell and to approach the condition it will be in during the wettest season of the year. Thus, the test will give comparable results in the same soil, whether made in a dry or in a wet season. In soils classified as SW or SP (containing five (5%) percent or less minus 200 particles), the swelling procedure is not essential and the test may be made as described under Section 5.8 F. after the water from one filling of the hole has completely seeped away.

C. Percolation Rate Measurement: With the exception of sandy soils (classified as SW or SP), percolation rate measurements shall be made on the day following the pre-soak procedure described under item B, above.

D. If the water remains in the test hole after the overnight swelling period, adjust the depth to approximately six (6) inches over the gravel. From a fixed reference point, measure the drop in water level over a thirty (30) minute period. This drop is used to calculate the percolation rate.

E. If no water remains in the hole after the overnight swelling period, add clear water to bring the depth of water in the hole approximately six (6) inches over gravel. From a fixed reference point, measure the drop in water level at approximately thirty (30) minute intervals for four (4) hours, refilling to six (6) inches over the gravel as necessary. The drop that occurs during the final thirty (30) minute period is used to calculate the percolation rate. The drops during prior periods provide information for possible modification of the procedure to suit local circumstances. The

requirement to conduct a four (4) hour test under this section is waived if three (3) successive water level drops do not vary by more than one-sixteenth ($1/16$) inch; however, in no case shall the test under this section be less than two (2) hours in length.

F. In sandy soils classified as SW or SP, (or other soils in which the first six (6) inches of water seeps away in less than thirty (30) minutes, after the twenty-four (24) hour swelling period), the time interval between measurements shall be taken as ten (10) minutes and the test run for one (1) hour. The drop that occurs during the final ten (10) minutes is used to calculate the percolation rate.

G. In Dawson Sands, the test shall be a minimum of four (4) hours, or until the last three (3) successive drops vary by less than one-sixteenth ($1/16$) inch, whichever is greater.