Check Your Soil: Infiltration Test (Percolation Test)

Good soil drainage is important. Determine how fast the soil drains at your site by conducting an infiltration test (also referred to as a percolation test). This test will let you know how well the existing soil infiltrates water. Ideal soils will infiltrate completely within 24 hours at a percolation rate of approximately 1.5 inches per hour.

As the diagram to the right indicates, complete the following steps:

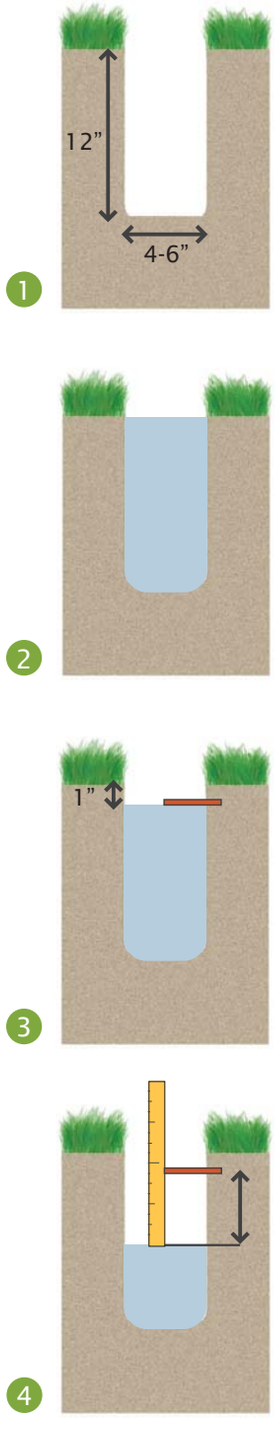
1. Dig a hole in the proposed rain garden site, approximately 12 inches in depth and four to six inches in diameter. To be more accurate, dig two holes. A standard post-hole digger is typically the tool of choice for this activity.

2. Fill with water to saturate the soil and then let stand until all the water has drained into the soil.

3. Once the water has drained, refill the empty hole again with water so that the water level is about one inch from the top of the hole. Use a stick to indicate the location of the starting water level. Record the time using a watch. Measure the depth of the water with a ruler.

4. Check the depth of water with a ruler every hour for at least four hours.

5. Calculate how many inches of water drained per hour. With sandy soils, the water should descend quickly. With clay soils, the water should descend slowly.

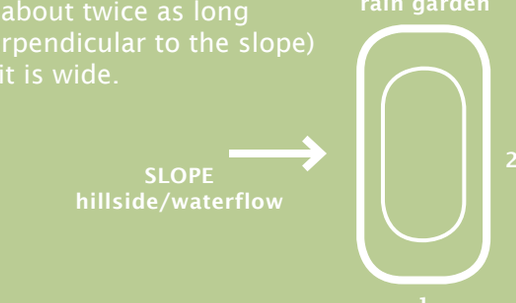


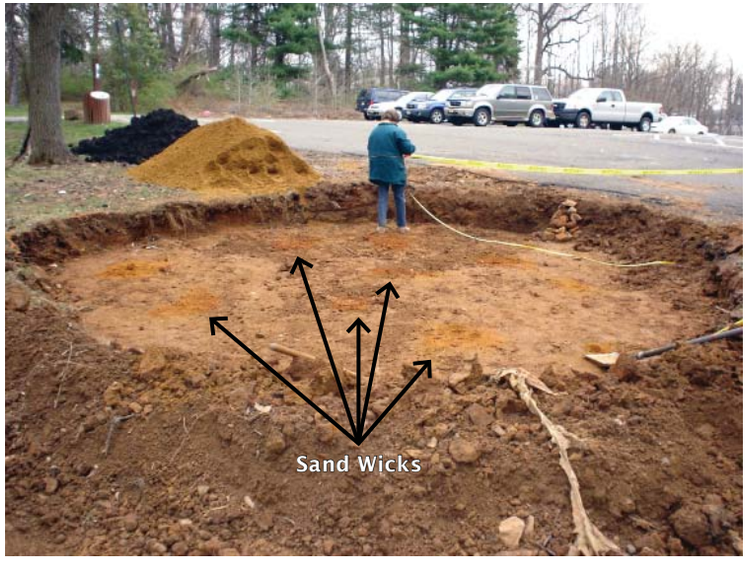
If the drainage rate is less than 1.5 inches per hour, or the water does not drain within 24 hours, add soil texture amendments such as coarse sand during installation. Alternatively, consider placing the rain garden in a different location on your property.

It is important to note that sometimes an infiltration test provides a false reading of a site's soil conditions. For example, during dry conditions, an infiltration test may demonstrate that the soil drains quickly and does not need amendments. However, during a rainy season, an infiltration test on that same soil may reveal that it is clayey and does not infiltrate well.

A GOOD RULE OF THUMB:

The rain garden should be about twice as long (perpendicular to the slope) as it is wide.





As illustrated in the image on the left, in addition to the recommended soil amendments, it may be helpful to add sand wicks to a rain garden site with clay soils. To do this, dig out holes, preferably 1 foot deep if possible, and fill in with pockets of coarse sand. This will increase the infiltration capacity of the rain garden.

Trailside Nature Center
Mountainside, NJ

Check Your Soil: Soil Test

While the infiltration test will give an initial evaluation of the site's soil conditions, a soil sample that you collect and submit to Rutgers Cooperative Extension (RCE) Soil Testing Laboratory will provide the most accurate reading of the soil (refer to page 59 in the Appendix of this Manual for contact information and a sample soil test analysis). The standard soil fertility test, which includes both a nutrient and pH analysis and recommendations, costs approximately $20. A soil texture test/mechanical analysis (sand, silt, clay percentage) is $30. You can purchase a soil test kit from your local RCE County Office. At the potential rain garden site, take approximately ten random soil samples near the location that you would like for your future rain garden. When taking your soil sample, remember to take about ten soil cores randomly at depths of 3, 6, 9, and 12 inches. Combine all of these into one composite sample. Send the soil sample and the order form to the RCE Soil Testing Laboratory. The results usually take about two weeks and will recommend any amendments needed for the soil based on the nutrient and pH analyses. The results of the soil texture test will help in calculating if coarse sand, topsoil, and/or compost are needed for the rain garden.

It is very likely that your soils will be highly compacted and will not drain well. To compensate for this, you may need to use a special soil mix within the rain garden. An ideal soil mix for a rain garden is 85 to 95% sands with no more than 25% of the sands as fine or very fine sands; no more than 15% silt and 2 to 5% clay content. The entire mix shall be amended with 3 to 7% organics *(NJBMP Manual, 2009, page 9.1-4)*. You may be able to use the existing soil, but if it is not in good condition, you may have to spend money on new soil and/or amendments such as lime, gypsum, and specific nutrients.

REMEMBER:

A rain garden is not a garden permanently filled with water!

Insert the trowel or spade to a depth of 3, 6, 9, or 12 inches, remove some soil and set it aside.

Insert the trowel again ½ inch from the first cut and just as deep. Collect a thin slice of soil, and place it in a clean bucket.

Repeat this procedure about ten times, and combine all of of these soil cores into one composite sample.