Test Your Soil

After finding a location for your rain garden, the next step is to test the soil in that location. You will be evaluating the texture (size of soil particles) and the soil drainage rate (the amount of time it takes water to soak into the ground). Understanding these characteristics will help you properly size your rain garden.

Be Sure to Check for High Groundwater

Avoid locating your rain garden in an area with high groundwater. Test the groundwater level during the rainy winter months, December through April. Late winter through March is the ideal time. To check for high groundwater, dig down 36 inches in a separate hole from where you plan to do your soil drainage test, but within 3 to 5 feet of that location. You can use a post hole digger for the groundwater test. Look into the hole. If you see water seeping in from the bottom or sides, find another location for your rain garden. If you don't see groundwater, go ahead and conduct your soil drainage test at a nearby spot.

Curtis Hinman

Curtis Hinman

Left Photo: *Clay soil—feels sticky, smooth, and can be molded like modeling clay.*

Right Photo: *Sandy soil—feels gritty and crumbles easy.*

Soil Texture

Soil texture is determined by the amount of sand, silt, and clay in the soil. The mix of these components affects how well the soil drains and how well it holds water and nutrients for plants to use.

THERE ARE FOUR STEPS TO COMPLETE THE SOIL DRAINAGE TEST

1. Dig Test Hole
2. Evaluate Soil Texture
3. Determine Desired Ponding Depth
4. Fill the Hole with Water and Observe Drainage Rate

1. DIG TEST HOLE

Dig a small hole about 2 feet deep and 1 to 2 feet in diameter. A bigger hole is OK if you have a backhoe or mini-excavator.

2. EVALUATE SOIL TEXTURE

As you dig, and before adding water to the hole to test drainage, evaluate the texture of the soil.

- If the soil is moist, put some in the palm of your hand and try to squeeze it into a ball.
- If the soil falls apart or can be broken up easily and is gritty feeling, this suggests a sandier, well-draining soil. If the soil is sticky, smooth, and forms a ball that can be worked like modeling clay, this suggests poor-draining soil with higher clay content.

- If the soil is smooth but not sticky, then it is likely a silty soil and moderate to poor-draining.
- If the soil is dry, add water a few drops at a time, break down the chunks to work the water into soil, and then perform the soil texture test.

Record your observations. These observations will help determine how the rain garden is constructed in the next section, 2-BUILD.

3. DETERMINE PONDING DEPTH

Next, decide on the maximum depth that water will pond in your rain garden (6 or 12 inches is recommended). Typically, a rain garden designed with a ponding depth of 12 inches will hold and manage more water from your drainage areas, particularly on poor soils. However, just as important is your preference for how the rain garden looks in your landscape. For example, you may wish to have a 12-inch depth, even if 6 inches is all you need for stormwater storage.

4. FILL THE HOLE WITH WATER AND OBSERVE DRAINAGE RATE

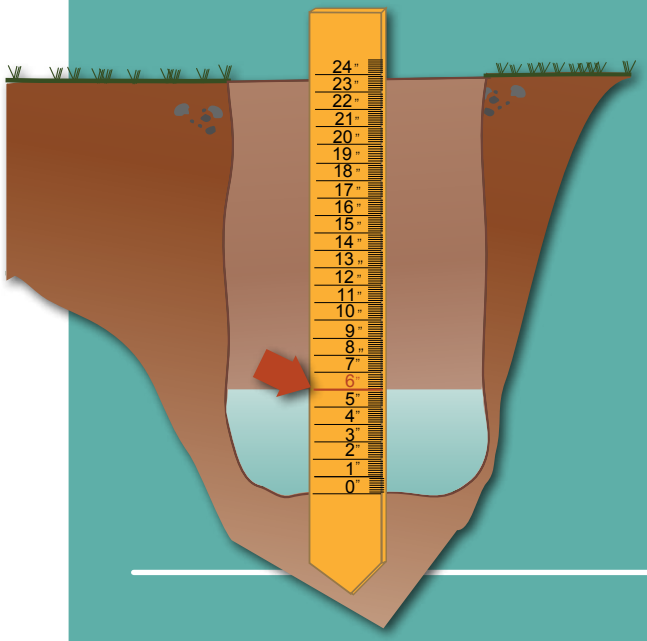
Finally, fill the hole with 6 or 12 inches of water, depending on the maximum depth of ponding decided in Step 3. Secure a yard stick or a self-made gauge in the hole for measuring the drainage rate. The self-made gauge can be a board or pipe with markings every half inch from the bottom.

Time how long it takes for the water to drain out completely. By the way, this can take awhile, so start in the morning. If there is still water in the hole after a day, it's OK to record how many inches have gone down since you started the test. Divide total inches by total hours to calculate the soil drainage rate.

How to Determine the Soil Drainage Rate

Divide Total Inches by Total Hours

Calculate the soil drainage rate by observing how long it takes water to drain in your test hole, then divide the total inches by the total hours.



EXAMPLE #1

Fill the hole with 6 inches of water.

- **If the water drains from the hole in 12 hours, the drainage or infiltration rate is:**
  - **6 inches divided by 12 hours = 0.5 inches per hour.**
  - **Record the drainage rate for later comparison to the rates shown in the Rain Garden Sizing Chart (see page 21).**

EXAMPLE #2

Fill the hole with 12 inches of water.

- **If the water drains from the hole in 40 hours, the drainage or infiltration rate is:**
  - **12 inches divided by 40 hours = 0.3 inches per hour.**
  - **Record the drainage rate for later comparison to the rates shown in the Rain Garden Sizing Chart (see page 21).**