



## **SOIL TESTING GUIDELINES FOR STORMWATER MANAGEMENT PRACTICES**

Effective October 6, 2012

Stormwater management practices often rely on the underlying soils for their long term success, and it is important when designing these practices that the appropriate soil characteristics are known. The following specifications describe the various practices required by Montgomery County to account for the soil types in the design of stormwater practices.

### **Call Miss Utility before digging!**

The following criteria are minimum requirements for infiltration soil testing:

#### **A. Soil Typing**

Soil Typing is a relatively simple method of determining the classification of a soil as shown on the USDA soil textural triangle and is suitable for residential projects on existing single family residential lots. Projects going through the subdivision process to create new lots should refer to "Infiltration Testing" below. Acceptable classifications for stormwater management in Montgomery County are Sand, Loam, Silt, Silt Loam, Sandy Loam and Loamy Sand. Soil typing is not suitable for use in new subdivisions, or for projects with commercial, industrial or institutional land use.

Soil typing requires collection and analysis of a soil sample. The sample should be representative of the depth and location of the proposed facilities on the project site. For example, on a single family residential lot where dry wells are being proposed, samples should be taken at approximately 5 feet below grade. Enough samples should be taken to get a representation of the general characteristics of the lot. Samples may be collected via hand auger or other method. Once collected, the samples must be analyzed to determine the USDA soil textural classification and the corresponding Unified Soil Classification. A copy of the results must be submitted along with the detailed plans for review. The report must include a plot of the sample(s) on the textural triangle. If groundwater or shallow bedrock is encountered during sample collection, alternative methods for providing the required stormwater controls should be investigated. Test locations must be shown on the detailed plans when they are submitted for review.

#### **B. Drawdown Testing**

Drawdown testing is a method for testing existing soils to assess the likelihood that a facility will drain within a specified amount of time and thereby function properly. This type of testing is appropriate for relatively shallow, vegetated practices such as Rain Gardens and Landscape Infiltration areas. It is intended that this relatively simple test can be performed by the homeowner or his representative.

To perform a drawdown test, excavate a hole approximately 2 feet deep and 1 foot wide in the area of the proposed facility. If the practice will be located in an area of fill, the test should be taken at an elevation 2 feet below the proposed final grade. Fill the hole to the top with water. Let the water drain completely. Within 12 hours of draining, fill the hole to the top with water again. Record the time it takes for all of the water to draw down completely. Draw down must occur within 48 hours. If this does not happen, alternative methods for providing the required stormwater controls should be investigated. A drawdown test requires written results to be submitted along with the detailed plans for review.

#### **C. Infiltration Testing**

Formal infiltration testing is required for all projects where Soil Typing and Drawdown Testing are not acceptable. Examples include new single family subdivisions, commercial, industrial and institutional projects. Infiltration testing is also required for all structural infiltration practices, such as Infiltration Trenches.



## 1. Field Investigation

- a. To be performed by boring or open excavation.
- b. Soil description to include all soil horizons.
- c. Soil textures to be identified according to USDA and Unified Soil Classification.
- d. Soil boring depth shall extend at least 4 feet below the bottom of the proposed facility in order to ensure the facility is separated from seasonal high groundwater or bedrock by at least 4 feet.
- e. Groundwater elevations are to be recorded at the time of boring and after 24 hours. Based on this information, the seasonal high groundwater table shall be determined.

## 2. Geotechnical Study

- a. Grain-size sieve analysis and hydrometer tests shall be employed for determining the USDA and Unified soil texture classifications.
- b. Actual infiltration rates shall be determined via conducting a percolation test 24 inches below the bottom of the proposed facility. Percolation tests shall be performed in a separate boring hole adjacent to the initial soil test hole. MCDPS does not accept a percolation test under constant head, because infiltration practices do not function with constant head. Additional requirements are as follows:
  - **Install a casing (5 inches diameter, 30" length) to 24" inches below proposed bottom of facility;**
  - Fill standpipe with water to a depth of 2 feet and allow to pre-soak for 24 hours. Twenty four hours later, refill standpipe to a depth of 2 feet and monitor water level for 4 hours on the hour. Use the average as the actual rate. The final rate shall be reported in inches per hour.
  - Should the infiltration rates prove inconsistent, additional percolation tests must be performed.
- c. Soil boring locations must correspond with the proposed location of the infiltration practice.
- d. A minimum of one boring for every 50 linear feet of infiltration practice or 400 square feet of facility surface area, whichever is most limiting, is required.
- e. Soil boring location stakes are to be left in the field for DPS inspection.
- f. Soils investigation shall be performed by a licensed soils or geotechnical engineer.
- g. A change in design at the permitting plan review stage may necessitate additional testing.
- h. Septic percolation tests are not acceptable.