
Appendix P

Geotechnical
Information
Requirements
for
Underground
BMPs

P.1 General Notes Pertinent to All Geotechnical Testing

A geotechnical report is required for all underground stormwater Best Management Practices (BMPs), including permeable pavement systems, bioretention, infiltration, ponds, wetlands, and storage practices or other practices as required by DDOE. The following must be taken into account when producing this report:

- Soil boring information is to be obtained from at least one boring at the center of the proposed structure location.
- Minimum boring depth is to equal the depth of the proposed BMP structure plus 2 feet.
- Soil boring should be in the Unified Soil Classification System. If an underground water table is encountered, it should be indicated in the boring logs. More extensive groundwater measurements may be required by DDOE.
- Number of required borings is based on the size of the proposed facility. Testing is done in two phases: (1) Initial Feasibility and (2) Concept Design.
- Testing is to be conducted by a qualified professional. This professional shall either be a registered professional engineer, soils scientist, or geologist and must be licensed in the District of Columbia.

Specific requirements for infiltration testing are discussed below.

P.2 Initial Feasibility Assessment

The feasibility assessment is conducted to determine whether full-scale testing is necessary, screen unsuitable sites, and reduce testing costs. A soil boring is not required at this stage. However, a designer or landowner may opt to skip the initial feasibility assessment at his or her discretion, and begin with soil borings.

The initial feasibility assessment involves either one field test per facility, regardless of type or size, or previous testing data, such as the following:

- On-site septic percolation testing, within 200 feet of the proposed BMP location, and on the same contour, which can establish initial rate, water table, and/or depth to bedrock;
- Geotechnical report on the site prepared by a qualified geotechnical consultant; or
- Natural Resources Conservation Service (NRCS) Soil Mapping showing an unsuitable soil group such as a hydrologic group “D” soil in a low-lying area or a Christiana Clay.

If the results of initial feasibility assessment, as determined by a qualified professional, show that an infiltration rate of greater than 0.5 inches per hour is probable, then at least 1 test pit should be dug or encased soil boring drilled for each proposed infiltration practice. For larger practices, additional test pits or soil borings are required for infiltration testing, to achieve 1 infiltration test per 1,000 square feet of infiltration bed surface area. (Note: when more than one test pit or boring is necessary for a single practice, the pit or boring locations must be equally spaced throughout the proposed area of the practice, or as directed by DDOE.)

P.3 Documentation

Infiltration testing data shall be documented, and include a description of the infiltration testing method.

P.4 Test Pit/Boring Requirements

- a. Excavate a test pit or drill a standard soil boring to a depth of 2 feet below the proposed facility bottom;
- b. Determine depth to groundwater table (if within 2 feet of proposed bottom) upon initial digging or drilling, and again 24 hours later;
- c. Determine Unified Soil Classification (USC) System textures at the proposed bottom and 2 feet below the bottom of the BMP;
- d. Determine depth to bedrock (if within 2 feet of proposed bottom);
- e. The soil description should include all soil horizons. If any of the soil horizons below the proposed bottom of the infiltration practice appear to be a confining layer, additional infiltration tests should be performed on this layer (or layers), following the procedure described below.
- f. The location of the test pit or boring shall correspond to the BMP location; test pit/soil boring stakes are to be left in the field for inspection purposes and shall be clearly labeled as such.

P.5 Infiltration Testing Requirements (field testing required)

- a. Install casing (solid 4" diameter, 30" length) at 2' below the proposed BMP bottom (or the identified confining layer). (Note: If fill soils are to be placed in the location of the proposed BMP, the infiltration rate for the underlying soils must be tested, regardless of the depth of the proposed fill.)
- b. Remove any smeared soiled surfaces and provide a natural soil interface into which water may percolate. Remove all loose material from the casing. Upon the tester's discretion, a 2" layer of coarse sand or fine gravel may be placed to protect the bottom from scouring and sediment. Fill casing with clean water to a depth of 24" and let pre-soak for 24 hours.
- c. Twenty-four hours later, refill casing to a depth of 24" with clean water and monitor water level (measured drop from the top of the casing) for 1 hour. Repeat this procedure (filling the casing each time) three additional times, for a total of four observations. Upon the tester's discretion, the final field rate may either be the average of the four observations or the value of the last observation. The final rate shall be reported in inches per hour.
- d. The location of the test shall correspond to the BMP location.
- e. If multiple tests are required for 1 BMP, the median value of the final rates reported for each test location shall be considered the measured infiltration rate for the BMP.
- e. Upon completion of the testing, the casings shall be immediately pulled, and the test pit shall be back-filled.

P.6 Infiltration Restrictions

If a Phase I Environmental Site Assessment determines that site contamination is likely, or if DDOE is aware of the presence of a brownfield or historic hotspot uses, such as current or previously existing leaking underground storage tanks (LUSTs), gas stations, or asphalt plants, an impermeable or compacted clay liner must be used for BMPs, and infiltration is restricted. If a Phase II Environmental Site Assessment is performed, and a qualified professional determines that the use of infiltration-based practices will not increase the likelihood of groundwater contamination, infiltration is not restricted. If there is no evidence of a history of contamination, BMP liners are not required, and infiltration is not restricted.



