

Recommend Approval: <u><i>D. S. [Signature]</i></u> <u>9/21/11</u> Team Leader Date <u><i>[Signature]</i></u> <u>09/21/2011</u> Division Chief Date	Maryland Department of Transportation State Highway Administration Office of Materials Technology MARYLAND STANDARD METHOD OF TESTS	
Approved: <u><i>[Signature]</i></u> <u>10/31/11</u> Director Date	SAMPLING AND TESTING OF LANDSCAPE SOILS	MSMT 356

SCOPE:

This procedure is used to determine if a material is suitable for use as landscape soil. This procedure provides the methods used to sample and test soil to determine its physical and chemical properties.

REFERENCE DOCUMENTS:

- Section 920 Landscaping Materials
- R 58 Dry Preparation of Disturbed Soil and Soil-Aggregate Samples for Test
- T 88 Particle Size Analysis of Soils
- T 194 Determination of Organic Matter in Soils by Wet Combustion
- T 248 Reducing Samples of Aggregate to Testing Size
- D 4972 Test Method for pH of Soils
- EC1:2 (V:V) Soluble Salts
- Mehlich-3 Nutrient Content
- USDA Textural Classification

SIGNIFICANCE AND USE:

The Soils and Aggregate Technology Division (SATD) will use the Producer's soil sample test results to determine if the landscape soil is eligible for testing and use.

The Landscape Operations Division (LOD) will use the Administration's soil test results to develop a Nutrient Management Plan (NMP) to determine the amount of compost, sulfur, limestone, and fertilizer to be applied to the soil for landscape construction. The Nutrient Management Plan developed from the test results should reflect the material available to the project.

MATERIALS AND EQUIPMENT:

Shovel, spade or soil probe.

Soil sample bags with liners capable of containing 20 pounds of material.

Glass jars with air tight lids - one pint size.

Labels, tags, and Form 27-B: Soil Test Report.

PRODUCER REQUIREMENTS – FURNISHED TOPSOIL AND BASE SOIL:

- A. The Producer shall sample **furnished topsoil** or **base soil** in conformance with 920.01.02 (a) for furnished topsoil or, 920.01.05 (a) (2) for base soil used in Bioretention Soil Mix (BSM). Submit the sample for testing to a soils testing laboratory recognized by the Administration.
- B. The list of recognized Soil Testing Laboratories can be found on the SHA Internet at the following address:

<http://www.marylandroads.com/businesswithsha/Evaluations/omt/soiltest.asp>

- 1. Results for each test listed in the **TESTING PROCEDURES** section of this Method shall be included on the submitted test report. The sample information required in the **SITE SAMPLING PROCEDURES: Producer** section of this Method shall accompany the test results when submitted to the Administration.
- 2. A copy of the test results for **furnished topsoil** shall be forwarded to the SATD at the following address:

Office of Materials Technology
Soils and Aggregate Technology Division
7450 Traffic Drive
Hanover, MD 21076

- 3. A copy of the test results for **base soil** shall be attached to the Source of Supply letter submitted for BSM.
- C. The SATD will review the soil test results to determine if the material conforms to the Administration's requirements. The test results will only be valid for six months from the date of the test.
 - 1. If the furnished topsoil test results are acceptable, the SATD will send a response to the Producer indicating that the material is eligible to be tested for use on

- Administration projects. The response will also indicate the expiration date of that eligibility.
2. If the base soil results are acceptable, the source letter will be processed for BSM material sampling otherwise the source will be denied until acceptable base soil is submitted.

ADMINISTRATION SAMPLING REQUIREMENTS:

- A. Preliminary Engineering Projects.** The project manager will contact the Pavement and Geotechnical Division (PAGD) to evaluate the project for topsoil prior to the semi-final review. For preliminary engineering projects, the soil surveyor will determine possible areas of salvaged topsoil to sample.
- B. Active Construction Projects.** For active construction projects, the Engineer will contact the SATD to schedule sampling and testing at least 45 calendar days prior to one of the following:
 1. Stripping of the salvaged topsoil or subsoil
 2. Placing of furnished topsoil or subsoil
 3. Seeding of non-topsoiled areas
 4. Placing BSM

MATERIAL SAMPLING PROCEDURES:

- A. Salvaged Topsoil.** The Administration will sample the topsoil prior to stripping or from each stockpile within the project limits. Sampling, quartering, and testing will be completed by utilizing the applicable specification methods. Sampling of salvaged topsoil on an active construction project may be waived by the Administration if topsoil sampling and a Nutrient Management Plan were completed during the preliminary engineering phase of the project. Sampling may not be waived if either of the following occurs:
 1. The NMP has expired, or
 2. The Administration requires additional testing.
- B. Furnished Topsoil.** The SATD will sample and test material from eligible topsoil producers referenced on a Source of Supply letter for project specific source approval or disapproval.
- C. Subsoil.** The Engineer will sample all subsoil areas on the project that are scheduled for seeding without topsoil. Sampling, quartering, and testing will be completed as outlined in the **SITE SAMPLING PROCEDURES** section below.

D. Bioretention Soil Mix.. The SATD will sample and test material from BSM producers with eligible base soil referenced on a Source of Supply letter for project specific source approval or disapproval.

SITE SAMPLING PROCEDURES:

Producer:

- A.** A 10 pound soil sample shall be taken of equal gatherings from a minimum of 10 different locations to accurately represent the designated area within the site or stockpile. The soil shall be sampled at representative depths and not from the surface. The composite 10 pound sample may be reduced according to T 248 to the size required by the testing laboratory, 1 pound minimum. The Sample will be submitted to one of the Administration's recognized soils testing laboratories for testing and labeled with the following information:
1. Date of sampling.
 2. Name of the producer and contact phone number.
 3. Street address of the stockpile location.
 4. A site map or sketch showing the stockpile location sampled.
 5. Identify whether the sample is to be tested as furnished topsoil or base soil.

Administration:

- B.** A 15-20 pound soil sample will be taken of equal gatherings from a minimum of 10 different locations within the designated area of the site at representative depths to accurately represent the material. For stockpiles, the soil shall be sampled at representative depths throughout the pile, and not from the surface. The sample will be labeled with the following information and forwarded to the Administration's laboratory for testing:
1. Contract number and date of sampling.
 2. Engineer's name, phone, and fax numbers.
 3. Type of soil - salvaged topsoil, furnished topsoil, subsoil, or BSM.
 4. Furnished topsoil and BSM shall have the name of the source of supply and stockpile location.
 5. Salvaged topsoil and subsoil shall have the location of the site or stockpile.

TESTING PROCEDURES:

Producer:

- A.** The Producer shall select one of the Administration's recognized soil testing laboratories to test for the following:
1. Grading Analysis (T 87)
 2. Textural Analysis (T 88)
 3. Soils pH (D 4972)
 4. Organic Matter (T 194)
 5. Soluble Salts (EC1:2 (V:V))
- B.** Source acceptance or rejection will be based on the requirements in 920.01.

Administration:

- A.** If the eligibility soil test results of the producer's topsoil or base soil are acceptable, the Administration will take a 15-20 lb bag sample of the topsoil or BSM stockpile.
- B.** The sample will be taken to the Administration's laboratory for testing of the items listed under **Producer** above. If the producer's material meets the Administration's requirements, the source will be approved for use on the specific project for which it was sampled. Project level source approval will be valid for a period of six (6) months from date of sampling.
- C.** The SATD will forward a copy of the completed soil test report to the LOD.
- D.** The SATD will also provide a jar sample of the prepared material to the LOD, labeled with the contract number and type of soil. The LOD will send the jar sample out for nutrient testing.
- E.** The LOD will use all of the test results to develop a project by project Nutrient Management Plan and forward a copy to the following:
1. The District ADE – Construction
 2. The Project Engineer
 3. The Area Materials Engineer
 4. Other appropriate personnel