

Section 723 - LANDSCAPE SOIL (TOPSOIL)

723.01 DESCRIPTION

Landscape soil shall be used for soil preparation and amending existing soil for landscape areas, erosion control areas, and lawn areas. The terms landscape soil and topsoil can be used interchangeably for this specification.

723.02 REFERENCE STANDARDS

Landscape Specification Guidelines, Landscape Contractors Association, MD, DC, and VA
Latest Version

Maryland's Lawn Fertilizer Law - Mda.maryland.gov/Pages/fertilizer.aspx

ASTM D5268-19
F-2396-11

M-NCPPC Section 200 – Excavation, Filling and Grading
Section 705 – Seeding and Sodding for Turf Areas
Section 728 – Athletic Field Construction

MCDPS Top-soil specification

723.03 DEFINITIONS

- A. Lawn areas are defined as any area that will support grass either planted as seed or sod including playing fields.
- B. Landscape areas are defined as any area that will support perennials, annuals, bulbs, shrubs, and trees.
- C. Blending is the process of mixing soil components to a uniform mixture.
- D. Landscape Soils are amended existing stockpiled topsoil, amended existing in-place soil, or amended soil from an off-site source that has been spread to finish grade, will support plant growth, and meets the following requirements.

723.04 MATERIALS

- A. Soil amendments may be used to amend the soil to meet specified requirements. Soil amendments and rates of application are to be determined based on soil test results. Specific recommendations for the type of amendments can be found in the Landscape Specification Guidelines by the Landscape Contractors Association of MD, DC, and VA (most recent addition).
 - 1. Sulfur: Sulfur for adjustment of soil pH shall be an unadulterated flower of sulfur.
 - 2. Lime: Ground or pulverized limestone, which contains a maximum of 50 percent total

oxides. In addition, Solu-Cal can also be used to correct pH.

3. Organic Matter: To increase organic matter based on soil test results, the following materials can be used:
 - a. Compost shall be made from yard trimmings, such as leaves, grass clippings and pruning that have been properly composted, are mature and have been sieved through a $\frac{3}{4}$ inch screen.
 - b. Compost shall be free of trash and contain no toxic substances harmful to plant growth.
 - c. Compost testing shall include a Solvita Compost Maturity Test on a fresh compost samples per testing instructions and have an CMI >6.0. The soluble salt contents shall be between 1-4 dS/m.
 - d. Compost should have between 35% and 50% organic matter, pH between 6.2 and 7.2, total organic carbon above 20%, carbon to nitrogen ratio between 12:1 and 20:1 and heavy metals within acceptable range.
4. Fertilizer: Fertilizer analysis and rate of application shall be determined based on soil test results. Fertilizer shall be uniform in composition, free flowing and suitable for application with approved equipment. The fertilizer requirements shall be reviewed by a certified Maryland Fertilizer Applicator. All fertilization shall meet the Maryland's Lawn Fertilizer Law.
5. Sand: The sand shall meet the specification per ASTM F-2396-11 for sand type, particle size distribution and shape. The contractor shall supply independent testing to verify compliance with ASTM F-2396-11.

B. Delivery, Storage, and Handling

1. Package materials will be delivered in manufacturer's unopened container or bundles; they will be identified with name, brand, type, weight, and analysis. Packaged materials will be stored in a manner that will prevent damage or intrusion of foreign matter. Any material that becomes contaminated will be removed from the job site.
2. Organic amendments will not be delivered or installed excessively wet or frozen.
3. Delivery location, stockpile locations and schedule will be coordinated with the M-NCPPC Construction Manager prior to delivery. Soils will be protected from eroding while stockpiled on site.
4. Bulk materials will be stabilized after delivery according to the Sediment Control Plan.

723.05 SUBMITTALS

- A. Manufacturer's and/or source data for all materials including soils.

- B. Certified chemical and mechanical analysis of samples of topsoil, existing soil, soil mixes, soil amendments and organic compost materials used in making of soil mixes.
- C. Submit a list of equipment anticipated for each type of soil work: decompaction, blending, unloading materials, handling and installation.
- D. Samples provided by the Contractor shall be typical of material to be delivered to the site and shall provide an accurate indication of color, texture, and the organic make-up of the material. Submit three (3) pound samples of the following:
 - 1. Organic Matter: one (1) sample of each type of organic matter to be used.
 - 2. Imported Off-Site Soil Prior to Amendment: one (1) sample
 - 3. Amended Off-Site Soil: one (1) sample
- E. Submit for approval the name of the company that will be testing the soil for approval by the M-NCPPC Construction Manager.
- F. Submit all soil tests to the M-NCPPC Construction Manager for all soil to be obtained from both on-site, off-site, and prepared soil.
- G. Submit fertilizer and soil amendment plan to M-NCPPC Construction Manager for approval. This plan shall be based on the results of the soil testing and meeting the required soil parameters.

723.06 QUALITY ASSURANCE

- A. All work shall meet minimum requirements of MCDPS Topsoil specification as well as what is contained within this specification.
- B. Soil tests shall be performed at each stage and approved by the M-NCPPC Construction Manager before the next step in the process.
- C. From the preparation of the subsoil to the finished area, the density of the subsoil/soil shall be tested with a soil penetrometer. The measurement must be less than 300 psi within the green zone otherwise aeration will be required until the soil measures less than 300 psi. If the Contractor disagrees with the penetrometer test, the Contractor at their cost can use a proctor exam to show the soil has equal or less than 85% compaction.
- D. All finished soils must be evenly mixed without the presence of “pockets” of any material including but not limited to compost, sand, or unmixed soil within the top six (6”) for grass or twelve (12”) for landscape areas. It shall have no stone or debris greater than ¾”. A mechanical screener may be required to remove materials.

723.07 CONSTRUCTION

- A. Examination and Verification of Conditions

1. The Contractor shall notify the M-NCPPC Construction Manager at least ten (10) calendar days prior to the start of landscape soil installation. The areas and conditions where planting amendments are to be installed will be examined, and the Contractor will notify the M-NCPPC Construction Manager of conditions detrimental to proper and timely completion of work. Work will not proceed until unsatisfactory conditions are corrected to permit proper installation of work.
2. Cooperation will be undertaken with other trades working in and adjacent to work areas. Drawings that show the development of the entire project will be examined to gain familiarity with the scope of other required work.
3. Determine location of all underground utilities prior to soil work. Existing utilities, paving, vegetation, and other facilities will be protected from damage caused by soil installation operations. All damaged areas: facilities and materials shall be restored, repaired or replaced as directed by M-NCPPC at the Contractor's expense.
4. Commencement of work will not begin until **all submittals** have been approved by the M-NCPPC Construction Manager. This includes but not limited to soil testing results and recommendations.
5. Sub-soil shall be prepared to meet all requirements of Section 200 – Excavation, Filling and Grading.

B. Soil Testing

1. All soil testing shall be done at the Contractor's expense. Each sample shall be extracted from a six-inch (6) deep core and prepared in accordance with recommendations of the soil-testing laboratory.
2. Each soil test shall determine soil texture (mechanical analysis), pH, magnesium, phosphorus, potassium, soluble salts, total calcium, nitrogen, and percent organic matter. If the soil is sandy, it shall also be tested for boron. Soil test results shall include laboratory recommendations for soil amendments to correct deficiencies and accomplish planting objectives. Follow recommendation of ASTM D5268-19, Landscape Specification Guidelines, latest edition, Landscape Contractors Association of Maryland, Virginia, and The District of Columbia, Section 705 - Seeding and Sodding Section for optimum plant growth and provide course of action based on their recommendation. The Contractor shall submit plans with the soil test results showing the locations of all soil tests. Incomplete test results and plans will be rejected by M-NCPPC Construction Manager and shall be redone at the Contractor's expense.
3. Soils provided from off-site sources: Obtain one soil test for each soil source per 500 cubic yards of soil and submit soil test results and soil amendment recommendations to M-NCPPC Construction Manager for review and acceptance prior to distributing and amending soil.
4. Existing stockpiled topsoil to be redistributed on site: Obtain one soil test per 500 cubic

yards of soil prior to application. Submit soil test results and soil amendment recommendations to M-NCPPC Construction Manager for review and acceptance prior to redistributing and amending soil.

5. Pavement or stone removal areas: Obtain one composite soil test per 10,000 square feet of subsoil material, or at least one composite test for each separate excavated area.
6. Landscape Area where existing soil to remain in place: Obtain one composite soil test for each isolated bed area. Submit one composite soil test per 20,000 square feet.
7. After final soil preparation: Obtain ten (10) additional soil samples shall be taken at random from planting and lawn areas throughout the site. The M-NCPPC Construction Manager shall determine locations of tests. These samples shall not be composite samples of different areas and are to assure that soils have been amended properly prior to planting or installation of lawn. Submit soil test results to M-NCPPC for review. If it is apparent that soils have not been amended as specified or protected from contamination, areas not in compliance with specified requirements shall be reworked and retested as required until soils meet specified requirements. All rework and retesting shall be at the Contractor's expense.

C. Soil Preparation

1. Soil shall be free of cinders, stones, slag, coarse fragments, gravel, sticks, trash, roots, and other debris over 3/4". Soil will be to a depth of 12" for landscape areas, 6" for lawn areas, and 18" for individual trees and shrubs. It must also be free of plants or plant parts of Bermuda grass, Quack grass, Johnson grass, Nutsedge, Poison Ivy, Phragmites, Canada thistle, or any noxious weeds. The soil shall contain no substances harmful to plant growth. The topsoil or landscape bedding soil shall be a sandy loam.
2. All fertilization must meet Maryland's Lawn Fertilizer Law - Mda.maryland.gov/Pages/fertilizer.aspx. A single fertilizer application may not exceed 0.9-pound total nitrogen per 1,000 square feet and 0.7 pound of soluble nitrogen per 1,000 square feet except when using enhanced efficiency fertilizer. Fertilization is prohibited between November 15 and March 1 or when the ground is frozen.

D. Soil Parameters. Contractor's amendment plan shall insure that the following parameters are achieved. The final soil shall meet ASTM D5268-19.

1. Soil for lawn areas:
 - a. The pH shall be between 6.0-7.0.
 - b. The minimum acceptable amount of Magnesium shall be 35 pounds per acre; Phosphorus shall be 100 pounds per acre; and Potassium shall be 85 pounds per acre.
 - c. Soluble salts shall not exceed 2.5 mmhos/cm. Calcium levels shall not exceed 2000 parts per million.

d. Organic Matter shall be greater than three (3.0) and less than ten (10.0) percent.

e. Sand content shall be between 20-60% as determined by soil test.

2. Soil for Landscaping areas

a. The pH shall be based on the specific plant requirements but will be within the range of 5.5-6.5.

b. The minimum acceptable amount of Magnesium shall be 71-124 pounds per acre; Phosphorus shall be 62-102 pounds per acre; and Potassium shall be 85-160 pounds per acre.

c. Soluble salts shall not exceed 2.5 mmhos/cm, Calcium levels shall not exceed 2,000 parts per million.

d. Organic Matter shall be greater than five (5.0) percent and less than ten (10.0) percent.

e. Sand content shall be between 20-60% as determined by soil test.

D. Final Soil Preparation

Athletic Fields: For soil preparation, refer to section 728 – Athletic Field Construction.

1. All areas to receive landscape soil shall be free of construction debris, refuse, compressible or decayable materials, stones greater than two inches and standing water to a depth of 12” for landscape areas and 6” for lawn areas. Refer to removals work for depth of excavation of specific areas.

2. Do not place fill when fill materials are wet, frozen or not at the optimum moisture content for proper compaction. Adjust sub grade levels as required to ensure that planting and lawn areas have adequate drainage. Installation of all utilities and irrigation mainlines shall be completed prior to beginning landscape soil work.

3. After the rough grade of the existing soil is accepted by M-NCPPC, the Contractor shall perform soil tests as specified and submit test results and soil amendment recommendations to the M-NCPPC Construction Manager.

4. The Contractor shall install soil amendments over the existing soil as approved by M-NCPPC Construction Manager. Soil amendments shall be tilled into the soil to loosen existing soil to a depth of 12" for landscape areas, and 6" for lawn areas. Excavation is not required. Rake the area smooth and compact the subsoil not to exceed 85 percent compaction. Level and regrade planting bed prior to installation of landscape soil.

5. Landscape soil shall be amended to meet the criteria of this section. Soil may be blended

on or off site. Soil to be blended on site, the amendments shall be blended into soil by layering the soil and soil amendments in alternating thin layers (not to exceed six inches) and mixing them uniformly as each layer is added.

6. Blending should be performed using a commercial soil blending equipment designed for the purpose.
7. Fill excavated areas with landscape soil amended to meet the criteria of this section. Soil shall be placed in successive lifts no thicker than six inches and compacted with hand-operated equipment to a maximum dry density of 85 percent. Over compaction of fills, which would be detrimental to planting objectives shall be corrected by loosening fills through tilling or other means and recompacting to specified limits at no additional cost to M-NCPPC.
8. The soil shall not be tilled or amended when the soil's moisture level is above field capacity or when soil is frozen.
9. If at any stage the soil is left exposed to weather conditions, M-NCPPC may require decompaction so to meet the requirements of this specification at no expense to M-NCPPC.
10. For soil preparation in critical root zone areas of existing trees, all work must be done by hand with shovels and rakes, unless otherwise approved in writing by the M-NCPPC Construction Manager.

723.08 MEASUREMENT AND PAYMENT

Payment will be full compensation for all material, labor, equipment, tools, and incidental items necessary to complete the work. Payment shall be made on a unit rate or lump sum basis as shown in the bid proposal.