STANDARD FOR TOPSOILING

Definition

Topsoiling entails the distribution of suitable quality soil on areas to be vegetated.

Purpose

To improve the soil medium for plant establishment and maintenance.

Water Quality Enhancement

Growth and establishment of a vigorous vegetative cover is facilitated by topsoil, preventing soil loss by wind and rain offsite and into streams and other stormwater conveyances.

Where Applicable

Topsoil shall be used where soils are to be disturbed and will be re-vegetated

Methods and Materials

1. Materials

   A. Topsoil should be friable[1], loamy[2], free of debris, objectionable weeds and stones, and contain no toxic substance or adverse chemical or physical condition that may be harmful to plant growth. Soluble salts should not be excessive (conductivity less than 0.5 millimhos per centimeter. More than 0.5 millimhos may desiccate seedlings and adversely impact growth). Topsoil must have an organic matter content no less than that shown in table 8.1[3] below. Organic matter content may be raised if necessary by the addition and mixing of additives which conform to the following specifications:
      a. No undigested (raw) material greater than 10% by volume.
      b. No trash
      c. No rocks or stones larger than 0.5”
      d. No raw or ‘fresh’ manure (green or otherwise). Compost must be fully decomposed.
      e. Quality of organic matter (compost) must be verified though certification from the supplier in accordance with NJ DEP solid waste requirements at NJAC 7:26A-4.5(b)

   B. Organic matter shall be blended with topsoil by any of the following methods:
      a. Blending in bulk either on site or by the supplier. Supplier is to provide written verification of quality and amount of organic material used in blending including final OM content in percent by weight in accordance with item A(e) above.
      b. Spread as a second layer over topsoil which has been previously placed, and then blended with a disk harrow, tractor mounted tiller or similar equipment to uniformly incorporate organic matter (see item C below to determine proper amount of compost to be spread per acre for incorporation) into topsoil.

[1] Friable means easily crumbles in the fingers, as defined in most soils texts.

[2] Loamy means texture groups consisting of coarse loamy sands, sandy loam, fine and very fine sandy loam, loam, and silt loam, textures and having less than 15% coarse fragments (particles greater than 2mm in size)

[3] Organic matter content of topsoil shall be determined by Methods of Soil Analysis. Part 3. Chemical Methods (Soil Science Society of America Book Series, No. 5) [Hardcover] Donald L. Sparks (Author, Editor)

c. Small areas may have organic matter incorporated by hand or with a rotor tiller.
d. Subsequent compaction remediation by ripping may be required in accordance with the Standard for Land Grading (19-1)

C. The quantity of organic matter to be added shall be determined by the following formula:

SOM = Existing soil organic matter fraction (expressed as decimal)
TOM = Target OM value (from table, expressed as decimal fraction)
COM = Compost organic matter fraction
CV = Compost volume required (cy/ac)

$CV = 2375^{*} \times [(TOM - SOM)/(COM)]$

Example: SOM = 1.5%
TOM = 2.5%
COM = 45%

CV = 2376 x [(0.025-0.0150/0.45]

CV = 52.8 cubic yards/acre

Table 8.1 – Target Organic Matter (TOM) content by soil texture

Soil textural class	**Minimum soil organic matter (% by mass)**
Sand and loamy sand	2.0
Sandy loam	2.5
Loam	4.0
Silt Loam, all Clay Loams, and Clay	5.0

* conversion factor to obtain results in cubic yards/ac

D. Topsoil substitute is a soil material which may have been amended with sand, silt, clay, organic matter, fertilizer or lime and has the appearance of topsoil. Topsoil substitutes may be utilized on sites with insufficient topsoil for establishing permanent vegetation. All topsoil substitute materials shall meet the requirements of topsoil noted above. Soil tests shall be performed to determine the components of sand, silt, clay, organic matter, soluble salts and pH level.

E. Topsoil and organic matter criteria for stabilization in the Pinelands National Reserve shall conform to the requirements established in the Standard for Permanent Vegetative Stabilization.

2. Stripping and Stockpiling

A. Field exploration should be made to determine whether quantity and or quality of surface soil justifies stripping.

B. Stripping should be confined to the immediate construction area.

C. Where feasible, lime may be applied before stripping at a rate determined by soil tests to bring the soil pH to approximately 6.5. In lieu of soil tests, see lime rate guide in seedbed preparation for Permanent Vegetative Cover for Soil Stabilization.

D. A 4-6 inch stripping depth is common, but may vary depending on the particular soil.

E. Stockpiles of topsoil should be situated so as not to obstruct natural drainage or cause off-site environmental damage.

F. Stockpiles should be vegetated in accordance with standards previously described herein; see standards for Permanent or Temporary Vegetative Cover for Soil Stabilization. Weeds should not be allowed to grow on stockpiles.

3. Site Preparation

A Grade at the onset of the optimal seeding period so as to minimize the duration and area of exposure of disturbed soil to erosion. Immediately proceed to establish vegetative cover in accordance with the specified seed mixture. Time is of the essence.

B. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application and anchoring, and maintenance.
See the Standard for Land Grading.

C. As guidance for ideal conditions, subsoil should be tested for lime requirement. Limestone, if needed, should be applied to bring soil to a pH of approximately 6.5 and incorporated into the soil as nearly as practical to a depth of 4 inches.

D. Employ needed erosion control practices such as diversions, grade stabilization structures, channel stabilization measures, sedimentation basins, and waterways.

4. Applying Topsoil

A. Topsoil should be handled only when it is dry enough to work without damaging soil structure; i.e., less than field capacity (see glossary).

B. A uniform application to a depth of 6 inches (unsettled) is required. Soils with a pH of 4.0 or less or containing iron sulfide shall be covered with a minimum depth of 12 inches of topsoil having a pH of 5.0 or more, in accordance with the Standard for Management of High Acid Producing Soil.

C. Topsoil should be finish graded with low ground pressure equipment or by hand when practical and feasible to reduce the potential for re-compacting the subsoil.