

SECTION 32 91 13
SOIL PREPARATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01, General Requirements, specification sections apply to this section.
 - 1. D557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 2. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and other Organic Soils.
 - 3. D5268, Standard Specification for Topsoil Used for Landscaping Purposes.
- B. Comply with Section 01 35 00, Environmental Protection and Special Controls, for Topsoil salvage.
- C. Section 32 93 00, Plants.

1.02 SUMMARY

- A. Section includes testing and amending onsite soil to meet the specified composition for planting soils.
- B. Related Requirements: Section 32 93 00, Plants, for placing planting soil for plantings.

1.03 DEFINITIONS

- A. AAPFCO: Association of American Plant Food Control Officials.
- B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This must be amended soil as indicated.
- C. CEC: Cation exchange capacity.
- D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.
- E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

- F. Imported Soil: Soil that is transported to Project site for use.
- G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.
- H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.
- J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called “humus” or “soil organic matter.”
- K. Planting Soil: Existing, onsite soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.
- M. SSSA: Soil Science Society of America.
- N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called “topsoil”; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- Q. USCC: U.S. Composting Council.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with authorities having jurisdiction.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Topsoil shall be stripped and stockpiled in accordance with Section 31 10 00, Site Clearing.

1.06 SITE CONDITIONS

A. Environmental Requirements:

1. Do not work soil when moisture content is so great that excessive compaction will occur, when it is muddy, when it is so dry that dust will form in the air, or when clods will not break readily and when it is frozen.
2. Apply water, if necessary, to bring soil to an optimum moisture content for grading.

PART 2 PRODUCTS

2.01 TOPSOIL

- A. Native Topsoil Previously Stripped and Stockpiled Under This Contract: Contractor shall be responsible for estimating quantity of stockpiled topsoil available onsite for reclamation Work.
1. Topsoil shall not be moved from the Job Site unless specifically authorized by the Government.
 2. Imported topsoil will not be used.

PART 3 EXECUTION

3.01 EXAMINATION

- A. General: Examine Site and verify that conditions are suitable for finish grading Work, and that no defects or errors are present which would interfere with or cause incorrect finish grading Work to occur. Contractor shall advise Government, in writing, of any conditions or defects encountered on Site before or during construction upon which the work of this section depends and which may adversely affect its performance.
- B. Notification of Unsuitable Conditions: Before proceeding with Work, notify Government of unsuitable conditions, discrepancies, or conflicts. Do not commence work until unsuitable conditions or defects have been evaluated by the Government and corrective measures have been taken.
- C. Soil Preparation: Verify that subsoil preparation Work is complete prior to commencing with topsoil placement.

3.02 PREPARATION

- A. Existing Conditions: Inspect and verify that rough subgrade preparation and elevations conform to grading plans before proceeding with Work of this section.

B. Protection of Existing Conditions:

1. Use every possible precaution to prevent damage to existing conditions to remain such as structures, utilities, irrigation systems, plant materials and paving on or adjacent to the Site of the Work.
2. Provide barricades, fences, or other barriers to protect existing conditions to remain from damage during construction.
3. Do not store materials or equipment, permit burning, or operate or park equipment within tree protection zones.
4. Submit written notification of conditions damaged during construction to the Government.

C. Topsoil shall be keyed to the underlying material by scarifying the top 6 inches of subgrade. Remove materials larger than 3 inches from the subsoil surface prior to topsoil placement.

D. Do not place topsoil on surfaces without prior approval from the Government.

3.03 FIELD ENGINEERING

A. General:

1. Establish lines and levels, locate, and lay out by instrumentation and similar appropriate means for planting area finish grades.
2. Provide grade stakes and string lines to achieve smooth finish grades with positive surface drainage acceptable to the Government.

B. Swale Flow Lines, Bottom of Slopes, Top of Slopes and Grade Breaks: Install grade stakes at maximum 20 feet on center.

C. High Points and Low Points: Provide grade stakes at high points and low points including top of berms, catch basin rims and area drain rims.

3.04 TOPSOIL PLACEMENT AND GRADING

A. Placement:

1. Conditions: Do not place topsoil when either the topsoil or subgrade are frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading.
2. Where possible, promptly re-distribute stripped topsoil and vegetation so that plants will reestablish and limit the opportunity for exotic invasive species to propagate.
3. Distribution:
 - a. Prior to distribution of topsoil spread any stockpiled subsoil evenly over areas designated for landscape restoration on plans.

- b. Distribution of topsoil shall be ecologically specific. Stripped and stockpiled topsoil shall be distributed according to the dominant habitat (Housing area, Lodgepole, Mesic Meadow 1, 2, 3, Meadow Edge, Dry Meadow, and Decomposed Granite) from which they originated. Placement of topsoil in as near to its original location will help preserve microorganisms and seeds of native plants.
 - c. Uniformly distribute topsoil in a loose condition over decompacted subsoil areas to provide an effective rooting medium.
 - d. Topsoil shall have an even thickness after natural settlement.
- 4. Adjust placement of conserved topsoil as directed by the Government in the field.
- 5. Topsoil placement shall be coordinated with seeding timeframe by Park.

B. Grading:

- 1. Complete final topsoil grading to:
 - a. The designated lines and grades as shown in the plans.
 - b. To match adjoining surface elevations and profiles.
- 2. Grade soil surface with smooth uniform slope between points where elevations are given.
- 3. Unless indicated otherwise, slope finish grades to drain surface water away from buildings, walks, paving, and other structures.
- 4. Slope finish grades to drain surface water to catch basins, area drains, and along indicated flow lines.
- 5. Grade soil surface smooth to be free of high and low areas that may inhibit surface drainage.
- 6. Do not cover or slope finish grades toward valve covers, manholes, vaults, hand holes, pull boxes, tracer wire boxes or any other surface feature or structure utilized by the Government.
- 7. Cut smooth falls to catch basin rim, finish flush.
- 8. Provide smooth transitions at top and bottom of slopes.

C. Excessive Compaction:

- 1. Take precautions and use appropriate equipment to prevent topsoil and subgrade compaction.
- 2. Topsoil shall be loosely placed and free of any compaction from spreading or handling equipment including pickups, heavy equipment, etc., for the full depth.
- 3. Scarify and re-grade areas showing any visible compaction from spreading or handling equipment.

D. Equipment: Use equipment of appropriate size and type to achieve the profiles and smooth soil surface free of high areas, depressions, and equipment tracks.

- E. Depressions and Loose Material: Fill and compact any depressions and remove loose material to finish surface true to line and grade, presenting a smooth, compacted, and unyielding surface.

3.05 TOLERANCES

- A. Hand Graded Areas:
 - 1. Grade to within 0.03 foot of grades indicated on the Drawings, except bring soil edge surface grades, paving, curbs, and other structures to within 0.01 foot of grades shown on the Drawings.
 - 2. Transition soil edge surface grades along paving, curbs, and other structures to areas of less strict tolerance over 10 feet distance.
- B. Machine Graded Areas: Grade to within 0.05 foot of grades indicated on the Drawings.
- C. Allowances: Make proper allowances for settlement.

3.06 MAINTENANCE

- A. In accordance with Section 01 57 23, Temporary Storm Water Pollution Prevention, employ erosion and sediment control practices as necessary to prevent soil erosion. Install erosion control measure immediately after placing topsoil.
- B. Permanent revegetation seeding performed by Park. Schedule with Government.

3.07 FIELD QUALITY CONTROL

- A. Aesthetic Acceptance of Grades: Upon completion of finish grading Work, schedule with Government a review to obtain aesthetic acceptance. Provide 5-day advance written notification.

END OF SECTION