

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Subsoil materials.
 - 2. Topsoil materials.

- B. Related Sections:
 - 1. Section 31 22 13 - Rough Grading.
 - 2. Section 31 23 17 - Trenching.
 - 3. Section 31 23 23 - Fill.
 - 4. Section 32 91 19 - Landscape Grading.
 - 5. Section 32 92 19 - Seeding and Soil Supplements.
 - 6. Section 32 92 23 - Sodding.
 - 7. Section 32 93 00 - Plants.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

- B. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m^{3 - 2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m^{3 - 3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).}}

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

- B. Materials Source: Submit name of imported materials source.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

- A. Subsoil Type S1

1. Imported borrow.
2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
3. Conforming to ASTM D2487 Group Symbol CL.
4. Material to be used for fills shall be soils acceptable to the Engineer. The suitability of materials and their disposition in fills will at all times be subject to approval by the Engineer. The distribution of materials throughout fills and embankments shall be such that there will be no lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding fill material. Pockets of material of uniform particle size such as sand and gravel, when encountered, shall be mixed with other material to obtain an acceptable material or shall be wasted when so directed by the Engineer.

B. Subsoil Type S2:

1. Excavated and re-used material.
2. Graded.
3. Free of topsoil, sod, brush, roots and other perishable or objectionable materials. Should any undesirable materials be present in the fills, they shall be removed prior to the start of compaction operations. No snow, ice or frozen material shall be incorporated in the fills. Rocks larger than 6 inches in greatest dimension shall be a minimum of one foot below the surface of fills. Rocks exceeding one foot in greatest dimension shall be a minimum of two feet below the surface of fills or shall be removed from the work and wasted.

2.2 TOPSOIL MATERIALS

A. Topsoil Type S3:

1. Excavated and reused material.
2. Graded.
3. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
 - a. Screening: Single Double screened.
 - b. Material to be used for fills and embankments shall be recently excavated soils acceptable to the Engineer. The suitability of materials and their disposition in fills and embankments will at all times be subject to approval by the Engineer. The distribution of materials throughout fills and embankments shall be such that there will be no lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding fill or embankment material. Pockets of material of uniform particle size such as sand and gravel, when encountered, shall be mixed with other material to obtain an acceptable material or shall be wasted when so directed by the Engineer.
 - c. Fill and embankment material shall be free of topsoil, sod, brush, roots and other perishable or objectionable materials. Should any undesirable materials be present in the fills or embankments, they shall be removed prior to the start of compaction operations. No snow, ice or frozen material shall be incorporated in the fills and embankments. Rocks larger than 6 inches in greatest dimension shall be a minimum of one foot below the surface of fills or embankments. Rocks exceeding one foot in greatest dimension shall be a minimum of two feet below the surface of fills or embankments, or may be used as riprap, provided they conform with the specification for riprap, or shall be removed from the work and wasted.

B. Topsoil Type S4:

1. Imported borrow.

2. Friable loam.
3. Reasonably free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds, and foreign matter.
 - a. Screening: Single screened.
4. Acidity range (pH) of 5.5 to 7.5.
5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.

2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Services Testing and analysis of soil material.
- B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698. ASTM D1557. AASHTO T180.
- C. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698. ASTM D1557. AASHTO T180.
- D. When tests indicate materials do not meet specified requirements, change material and retest.
- E. Furnish materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXCAVATION

- A. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.
- B. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.
- C. Remove excess excavated materials subsoil and topsoil not intended for reuse, from site.
- D. Remove excavated materials not meeting requirements for subsoil materials and topsoil materials from site.

3.2 STOCKPILING

- A. Stockpile materials on site at locations indicated designated by Architect/Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Stockpile topsoil 8 feet high maximum.
- E. Prevent intermixing of soil types or contamination.

- F. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- G. Stockpile unsuitable hazardous materials on impervious material and cover to prevent erosion and leaching, until disposed of.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION