

SECTION 32 9119

LANDSCAPE GRADING

PART 1 GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.01 WORK INCLUDED

- A. Provide all equipment and materials, and do all work necessary to complete the site grading as indicated on the Drawings and as specified.

1.02 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
1. Section 01 40 00, QUALITY REQUIREMENTS; Topsoil and other planting materials testing.
 2. Section 31 23 00, SITE EXCAVATING, BACKFILLING AND COMPACTING; Excavation, backfill; establishment of subgrade elevations.
 3. Section 32 92 00, LAWNS AND GRASSES.
 4. Section 32 93 00, TREES, PLANTS AND GROUND COVERS.

1.03 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. American Society for Testing and Materials (ASTM):

D 698	Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (6000kN-m/m ³))
D 1556	Density of Soil in Place by the Sand-Cone Method
D 2167	Density and Unit Weight of Soil In Place by the Rubber-Balloon Method

1.04 EXISTING CONDITIONS

- A. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

1.05 QUALITY CONTROL

- A. The Architect reserves the right to perform on-site observation during the grading operations. The observations may include, but not be limited to the following:
 - 1. Observation of subgrade preparation for slab-on-grade and paved areas.
 - 2. Observation of rough and finish grading operations.
 - B. All grade breaks shall be staked with grade stakes at each end, any change of direction, and at 20' centers along the length for Architect's review during grading operations.
 - C. All wetlands shall be staked with grade stakes at upper perimeter and lower perimeter for review and approval by Architect.
 - D. Perform field density tests in accordance with ASTM D 1556 or ASTM D 2167.
 - 1. Make at least one field density test of the subgrade for every 2000 sq. ft. of paved area, but in no case less than three tests.
 - 2. In each compacted fill layer, make one field density test for every 2000 sq. ft. of overlaying paved area, but in no case less than three tests.
 - 3. Make at least one field density test of the planting soil for every 2000 sq. ft. of plant bed area, but in no case less than three tests.
 - 4. Make at least one field density test of the planting soil for every 2000 sq. ft. of lawn area, but in no case less than three tests.
 - D. If, in the opinion of the Architect, based on reports of the testing service and inspection, the subgrade or fills which have been placed are below the specified density, additional compaction and testing will be required until satisfactory results are obtained.
 - 1. The results of density tests of soil-in-place will be considered satisfactory if the average of any four consecutive density tests which may be selected are in each instance equal to or greater than the specified density, and if not more than one density test out of five has a value more than 2% below the required density.
 - E. The Architect's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Architect, nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.
- 1.06 PROTECTION OF EXISTING STRUCTURES AND UTILITIES
- A. The work shall be executed in such manner as to prevent any damage to adjacent property and any other property and existing improvements such as, but not limited to: streets, curbs, paving, utility lines and structures, monuments, bench marks and other public and private property.
 - B. In case of any damage or injury caused in the performance of the grading work, the Contractor shall, at his own expense, make good such damage or injury to the satisfaction of, and without cost to the Owner. Existing roads, sidewalks, and curbs damaged during the grading work shall be repaired or replaced to their original condition at the completion of operations. The Contractor shall replace, at his own cost, existing bench marks, monuments, and other reference points which are disturbed or destroyed.
- 1.07 COORDINATION
- A. Prior to start of grading operations, the Contractor shall arrange an on-site meeting with the Architect for the purpose of establishing Contractor's schedule of operations and scheduling inspection procedures and requirements.

- B. As construction proceeds, the Contractor shall be responsible for notifying the Architect prior to start of grading operations requiring inspection and/or testing.
- C. The Contractor shall be responsible for obtaining test samples of soil materials proposed to be used and transporting them to the site sufficiently in advance of time planned for use of these materials for testing of materials to be completed. Use of these proposed materials by the Contractor prior to testing and approval or rejection, shall be at the Contractor's risk.

PART 2 - PRODUCTS

2.01 SOURCE OF MATERIALS

- A. Material shall be obtained from required on-site excavation, to the extent that suitable material is available, and from off-site sources, to the extent that suitable material is not available from on-site excavation.
- B. Refer to Section 32 92 00 and Section 32 93 00 for preparation and placement of planting soils.

PART 3 - EXECUTION

3.01 SUBGRADE COMPACTION

- A. Refer to Section 31 23 00, SITE EXCAVATING, BACKFILLING AND COMPACTING for required levels of subgrade compaction at paved areas.
 - 1. Unless otherwise indicated, scarified subgrade in landscape areas shall be compacted to 86% - 88% compaction ASTM D698 Standard Proctor.
 - 2. Planting Soil – Planting Pits and Beds: shall be spread in lifts not greater than twelve inches and compacted to a density between 82 and 86 percent Standard Proctor Maximum Dry Density.
 - 3. Planting Soil - Lawn Areas: shall be spread over the area and shall be compressed to a density of 86 to 88% Standard Proctor maximum dry density. No vibratory compaction of the subgrade or the planting medium shall take place. No rubber-tired equipment or heavy equipment except for a small bulldozer shall pass over soils after they have been loosened or planting medium spread.

3.02 GRADING - GENERAL

- A. Uniformly grade areas within the limits of site grading under this section, including adjacent transition areas. Smooth finished surfaces within specified tolerances, and between points where elevations are shown, or between such points and existing grades.
- B. The degree of finish required will be that ordinarily obtainable from either blade-grader or scraper operations.
 - 1. Ditches: Finish ditches to ensure proper flow and drainage. Conduct final rolling operations to produce a hard, uniform, and smooth cross-section.
 - 2. Grade Breaks located on the plans indicate crisp transitions, not blended or rounded edges. These should be clean, sharp, and uniform in line and curve as indicated on the plans

3.03 ROUGH GRADING

- A. General: Rough grading shall include the shaping, trimming, rolling and refinishing of all surfaces of the subbase, shoulders, earth embankments and the preparation of grades as shown on the Drawings. The grade of shoulders and sloped areas may be done by machine methods.
- B. Do all cutting, filling and grading to lines and grades indicated on the Drawings. Grade evenly to within the dimensions required for grades shown on the Drawings and specified herein. No stones larger than 2 in. shall be placed in upper 6 in. of fill. Fill shall be left in compacted state at the end of work day and sloped to drain.
 - 1. Architect may make such adjustments in grades and alignments as are found necessary to avoid special conditions encountered.
 - 2. Provide a smooth transition between adjacent existing grades and new grades.
 - 3. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- C. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
 - 2. Walks: Plus or minus 1 inch (25 mm).
 - 3. Pavements: Plus or minus 1/2 inch (13 mm).
 - 4. Up to 2 in. in 10 ft. – 0 in. tolerance shall be permitted on slopes provided the slopes are uniform in appearance and without any abrupt changes.
 - 5. Traffic of men and equipment across soil subgrade areas shall be prohibited following excavation to the required lines and grades.

3.04 FINE GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Finish Grading:
 - 1. Lawn or Unpaved Areas: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
 - 2. Walks: Shape the surface of areas under walks to line, grade and cross-section, with the finish surface not more than 0.00 ft. above or 0.10 ft. below the required subgrade elevation, compacted as specified, and graded to prevent ponding of water after rains.
 - 3. Pavements: Shape the surface of the areas under pavement to line, grade and cross-section, with the finish surface not more than 1/2 in. above or below the required subgrade elevation, compacted as specified, and graded to prevent ponding of water after rains. Include such operations as plowing, discing, and any moisture or aerating required to provide the optimum moisture content for compaction. Fill low areas resulting from removal of unsatisfactory soil materials, obstructions, and other deleterious materials, using satisfactory soil material. Shape to line, grade, and cross-section as shown on the Drawings.

3.05 MAINTENANCE

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to the specified tolerances.
- C. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, re-shape, and compact to the required density prior to further construction.

3.06 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove waste materials, including excavated material classified as unsatisfactory soil material, trash and debris, and dispose of it legally off the Owner's property.

3.07 WASTE MANAGEMENT

- A. Separate and dispose of waste in accordance with the Project's Waste Management Plan.

END OF SECTION