CHAPTER 3.03
EARTHWORK

Sections:

3.03.005 GENERAL. This Chapter defines the requirements for excavation and backfill for structures, construction requirements for embankments and fills, and sub-grade preparation for pavements and other surface improvements.

3.03.010 EXCAVATION FOR STRUCTURES. All structures shall be founded on undisturbed original subsoil. All unauthorized excavation below the specified structure subgrade shall be replaced with concrete monolithic with that of the slab above or with coarse gravel compacted to ninety-five (95) percent of maximum dry density as measured by AASHTO T-99 in lifts not to exceed ten (10) inches.

A. Subgrade soil for all concrete structures, regardless of type or location, shall be firm, dense, thoroughly compacted and consolidated; shall be free from mud and muck and shall be compacted to ninety-five (95) percent of AASHTO T-99. Coarse gravel or crushed stone may be used for subsoil's reinforcement if satisfactory results can be obtained thereby. Such material shall be applied in thin layers not to exceed four (4) inches, each layer being embedded in the subsoil by thorough tamping. All excess soil shall be removed to compensate for the displacement of the gravel or crushed stone, and the finished elevation of any subsoil reinforced in this manner shall not be above the subgrade elevation.

3.03.015 BACKFILL AROUND STRUCTURES. Backfill around structures shall be placed to the lines shown on the approved drawings, or as directed. After completion of foundation footings and walls and other construction below the elevation of the final grades, and prior to backfilling, all forms shall be removed and excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of excavated material or borrow of sand, gravel, or other suitable material, and shall be placed in layers not exceeding ten (10) inches in uncompacted thickness. Each layer shall be compacted by hand or machine tampers or by other suitable equipment to a density equal to ninety-five (95) percent of maximum dry density as measured by AASHTO T-99.

3.03.020 CONSTRUCTION OF EMBANKMENTS AND FILLS. Unsuitable materials that occur in the foundations for embankments and fills shall be removed by clearing, stripping, and/or grubbing. Where suitable materials occur, after stripping, the foundation shall be scarified to a depth of not less than six (6) inches, and the loosened material shall be moistened and compacted as hereinafter specified for each layer. All materials in embankments and fills shall be placed, moistened, and compacted as provided in the following paragraphs:

A. When the embankment or fill exceeds the amount of excavation, sufficient additional material shall be obtained from borrow pits provided by the Contractor. All material proposed to be imported shall be subject to the review and approval of the City Engineer or his representative prior to start of hauling operations.

B. The materials used for embankment and fill construction shall be free from sod, grass, trash, rocks larger than four inches in diameter, and all other material unsuitable for construction of compacted fills.

C. Grading of completed embankments and fills shall bring the surfaces to a smooth, uniform condition with final grades being within 0.1 foot of the design grade. In no case shall embankment slopes be steeper than 1½ : 1.

3.03.025 COMPACTING EARTH MATERIALS. The material shall be deposited in horizontal layers having a thickness of not more than ten (10) inches after being compacted as hereinafter specified; provided that, when mechanical equipment is used for placing and compacting the material on a sloping foundation, the layers may be

placed parallel to the foundations. The distribution of materials shall be such that the compacted material will be homogeneous and free from lenses, pockets, or other imperfections.

A. Prior to and during compaction operations the material shall have the optimum moisture content required for the purpose of compaction, and the moisture content shall be uniform throughout the layers, insofar as practicable. Moistening of the material shall be performed at the site of excavation, but such moistening shall be supplemented as required by sprinkling at the site of construction. If the moisture content is more than optimum for compaction, the compaction operations shall be delayed until such time as the material has dried to the optimum moisture content. When the material has been conditioned as hereinbefore specified, the backfill or embankment shall be compacted as follows:

B. Under Roadways and extending six (6) inches beyond the proposed curb line the fill or embankment material shall be compacted to a density equal to not less than ninety-five (95) percent of maximum dry density as measured by AASHTO T-180.

C. Under Sidewalk and Drive Approaches the fill or embankment material (to at least one (1) foot each side of the edge of the slab) shall be compacted to a density equal to not less than ninety-five (95) percent of maximum dry density as measured by AASHTO T-180.

D. Other Fills and Embankments not listed above shall be compacted to a density equal to not less than eighty-five (85) percent of maximum dry density as measured by AASHTO T-180.

3.03.030 ROAD SUB-GRADE PREPARATION. In both cut and fill areas the paving sub-grade shall be scarified to a depth of eight (8) inches and compacted to the equivalent of ninety-five (95) percent of maximum dry density as measured by AASHTO T-180. No rocks larger than four (4) inches in diameter, organic material, soft clay, spongy material, or other deleterious material will be permitted in this scarified sub-grade layer. Rough sub-grades shall be shaped and graded to within a tolerance of 0.10 foot of design grade, and drainage shall be maintained at all times. During the rolling operation moisture content of the subgrade layer shall be maintained at not less than ninety-seven (97) percent or more than one hundred-five (105) percent of optimum moisture content. Rolling shall be continued until the entire roadbed is compacted to the specified density to a minimum depth of eight (8) inches.

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