SECTION 02316 - FILL AND BACKFILL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade.

1.3 RELATED REQUIREMENTS

A. Geotechnical report; bore hole locations and findings of subsurface materials.

B. Section 02310 - Grading: Removal and handling of soil to be re-used.

C. Section 02315 - Excavation: Removal and handling of soil to be re-used.

D. Section 03300 - Cast-in-Place Concrete.

1.4 REFERENCE STANDARDS

A. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

B. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2007.

1.5 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction Density Test Reports.

1.6 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Structural Fill: Imported borrow.
   1. Graded.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

3. Free of organics.
4. Plasticity Index (PI) between 10 and 20 percent, with moisture content between minus two (-2) and plus three (+3) points of the optimum.
5. Graded in accordance with ASTM C 136, within the following limits:
   a. 2 inch sieve: 100 percent passing.
   b. 1 inch sieve: 95 percent passing.
   c. 3/4 inch sieve: 95 to 100 percent passing.
   d. 5/8 inch sieve: 75 to 100 percent passing.
   e. 3/8 inch sieve: 55 to 85 percent passing.
   f. No. 4 sieve: 35 to 60 percent passing.
   g. No. 16 sieve: 15 to 35 percent passing.
   h. No. 40: 10 to 25 percent passing.
   i. No. 200: 5 to 10 percent passing.

2.2 SOURCE QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 02310 for additional requirements.

3.2 PREPARATION

A. In the area occupied by the foundation , plus a distance show on the drawings, remove topsoil including all organic materials, roots, etc. from the site per drawings. Do not use for underfloor fill. Remove additional material as necessary to provide minimum fill per drawings.

B. The resulting surface shall be proof rolled with a sufficiently heavy roller (15 TONS) to locate and densify weak and compressible zones. A minimum of 6 passes of the roller is required. Any soft sposts shall be removed and replaced with compacted structural fill.

C. The rolled subgrade shall be scarified just prior to fill placement to a minimum depth of 6" and recompacted to a mimimum of 95% of the maximum density as determined by the TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) TEX-113-E compaction test, maintaining moisture content between -1 and +3 percentage points until covered.

D. The rolled subgrade shall be scarified just prior to fill placement to a minimum depth of 6" and recompacted to a mimimum of 95% of the maximum density as determined by ASTM D 698 compaction test, maintaining moisture content between -1 and +3 percentage points until covered.

3.3 FILLING

A. Beginning at low end, build up to the bottom of the slab with structural fill. Refer to plan for minimum thicknesses. NO DIRT FILL SHALL BE USED UNDER THE BUILDING FOUNDATION. Submit written certification of compliance with requirements above by test preformed on field sample.

B. All fill shall be placed in 8" loose horizontal lifts and compacted to a minimum of 95% of the maximum density as detemined by ASTM D 698 compaction test.

C. Excess fill at building perimeter shall be cut and graded to comply with finish grade requirements, and shall be overlaid with a 1'-0" thick layer of impervious clay for a distance of 5'-0" from building line.

3.4 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

3.5 FIELD QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for field inspection and testing.

3.6 CLEANING

A. Leave unused materials in a neat, compact stockpile.

B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION