SECTION 31 2323
FILL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Perform Project backfilling and compacting as described in Contract Documents, except as specified below.
   2. Procedure and quality for backfilling and compacting performed on Project under other Sections unless specifically specified otherwise.

B. Related Sections:
   1. Section 31 0501: Common Earthwork Requirements.
   2. Division 32: Compaction of sub-grade under walks and paving.
   3. Performance of backfilling and compacting inside and outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.

1.2 REFERENCES

A. American Society For Testing And Materials:
   1. ASTM D 1557-02, 'Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.'
   2. ASTM D 2216-98, 'Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.'
   3. ASTM D 2487-00, 'Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).'
   4. ASTM D 2922-01, 'Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).'
   5. ASTM D 3017-01, 'Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).'

1.3 DEFINITIONS

A. Relative Compaction: Ratio of field dry density as determined by ASTM D 2922 and ASTM D 3017 or 2216, and laboratory maximum dry density as determined by ASTM D 1557.

1.4 QUALITY ASSURANCE

A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 31 2213.

1.5 SEQUENCING

A. Do not backfill against bituminous dampproofing for 24 hours after application of dampproofing.
B. Before backfilling, show utility and service lines being covered on record set of Drawings. Do not backfill until utilities involved have been tested and approved by Architect and until instructed by Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Site Material: Existing excavated material on site is suitable for use as fill and backfill to meet Project requirements.

B. Imported Fill / Backfill:
1. Well graded material conforming to ASTM D 2487 free from debris, organic material, frozen materials, brick, lime, concrete, and other material which would prevent adequate performance of backfill.
   a. Under Building Footprint And Paved Areas: Fill shall comply with soil classification groups GW, GP, GM, SW, SP, or SM. Fill may not contain stones over 6 inches 150 mm diameter and 90 percent minimum of fill shall be smaller than 1-1/2 inch 38 mm in any direction.
   b. Under Landscaped Areas:
      1) Fill more than 36 inches 900 mm below finish grade shall comply with soil classification groups GW, GP, GM, SW, SP, or SM. Fill may not contain stones over 6 inches 150 mm diameter and 90 percent minimum of fill shall be smaller than 1-1/2 inch 38 mm in any direction.
      2) Fill less than 36 inches 900 mm below finish grade shall comply with soil classification groups SW, SP, SM, or SC. Fill may not contain stones larger than 1-1/2 inches 38 mm in any direction and 90 percent minimum of fill shall be smaller than 3/8 inch 4.7 mm in any direction.

C. Excavatable Slurry Fill / Backfill:
1. Contain maximum of 94 lbs of cement per yard 56 kg of cement per cu m of slurry fill / backfill.
2. Minimum stable air content of 20 percent, Darafill dosage as necessary.
3. Maximum water content of 36 gallons per yard 225 L per cu m of backfill.
4. Maximum compressive strength of 150 psi at 28 days.
5. Type Two Acceptable Products:
   b. Equal as approved by Architect before use. See Section 01 6000.

D. Engineered Fill:

PART 3 - EXECUTION

3.1 PREPARATION

A. Before placing fill, base, or finish work, prepare sub-grade as follows:
1. Do not place fill or base over frozen sub-grade.
2. Under Building Slabs / Pads, Concrete Site Elements, And Concrete Driveways And Parking Areas: Scarify sub-grade 6 inches 150 mm deep, moisture condition to uniform moisture content of between optimum and 4 percent over optimum, and mechanically tamp 6 inches 150 mm deep to 90 percent minimum of relative compaction.
3. Under Asphalt Driveways And Parking Areas: Scarify sub-grade 6 inches 150 mm deep, moisture condition to uniform moisture content between optimum and 4 percent over optimum, and mechanically tamp to 95 percent minimum of relative compaction.
4. Landscape Areas: Compact sub-grade to 85 percent relative compaction.
3.2 PERFORMANCE

A. Fill / Backfill:
   1. General:
      a. Around Buildings And Structures: Slope grade away from building as specified in Section 31 2216. Hand backfill when close to building or where damage to building might result.
      b. Site Utilities:
         1) In Landscape Areas: Use backfill consisting of on-site soil.
         2) Under Pavement And Concrete Site Elements: Extend excavatable slurry fill / backfill to elevation of subgrade. Do not place base material until excavatable slurry fill / backfill has cured 72 hours.
      c. Do not use puddling or jetting to consolidate fill areas.
   2. Compacting:
      a. Fill / Backfill And Base:
         1) Under Building Slabs or Pads, Driveways, And Parking Areas: Place in 8 inch 200 mm maximum layers, dampen (do not soak), and mechanically tamp to 95 percent minimum of maximum density as established by ASTM D 1557.
         2) Under Concrete Site Elements And Around Foundation Walls: Place in 8 inch 200 mm maximum layers, dampen but do not soak, and mechanically tamp to 90 percent minimum of maximum density as established by ASTM D 1557.
         3) Utility Trenches:
            a) Site: Place fill in 12 inch 300 mm layers and moisture condition to plus or minus 2 percent of optimum moisture content. Compact fill to 90 percent minimum relative compaction to within 12 inches 300 mm of finish grade. Compact fill above 12 inches 300 mm to 85 percent relative compaction.
            b) Under Slabs: Place fill in 6 inch 150 mm layers, moisture condition to plus or minus 2 percent of optimum moisture content, and compact to 95 percent minimum relative compaction to within 4 inches 100 mm of finish grade. Final 4 inches 100 mm of fill shall be granular base as specified in Section 31 2323.
         4) Fill Slopes: Compact by rolling or using sheepfoot roller.
         5) Backfill Under Footings: Not allowed.
         6) Other Backfills: Place other fills in 12 inch 300 mm layers and compact to 90 percent relative compaction.
      b. Engineered Fill:

3.3 REPAIR / RESTORATION

A. Repair damage to other portions of the Work resulting from work of this Section at no additional cost to Owner. On new work, arrange for damage to be repaired by original installer.

3.4 CLEANING

A. Debris and material not necessary for Project are property of Contractor and are to be removed before completion of Project. However, if material necessary for Project is hauled away, replace with specified fill / backfill material.

END OF SECTION