SECTION 31 2000 – EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

B. Comply with most current edition of the Northwestern University Design Standards.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This Section includes :

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for walks, pavements, turf and grasses and plants.
3. Subbase course for concrete walks and pavements.
4. Subbase course and base course for paving.
5. Subsurface drainage backfill for walls and trenches.
6. Excavating and backfilling trenches for utilities and pits for buried utility structures.

C. Related sections include the following:

1. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
2. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
3. Section 329200 "Turf and Native/Adaptive Plantings" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
4. Section 329300 "Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2.

c. Sewn Seam Strength: 223 lbf; ASTM D 4632.
d. Tear Strength: 90 lbf; ASTM D 4533.
e. Puncture Strength: 90 lbf; ASTM D 4833.
f. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
g.

PART 3 - EXECUTION

A. PREPARATION

1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
2. Protect and maintain erosion and sedimentation controls during earth-moving operations.
3. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

B. DEWATERING

1. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
2. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

    a. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

C. EXPLOSIVES

1. Explosives: Do not use explosives.

D. EXCAVATION, GENERAL

1.

4. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

    a. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

5. Trenches in Tree- and Plant-Protection Zones:

    a. Hand-excavate to indicated lin(:)]TJ 0169CNd0.831 0 Td ( )e48b2(e)-12.2aones:

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2. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

    a. Turf or Unpaved Areas: Plus or minus 1 inch.
    b. Walks: Plus or minus 1 inch.
    c. Pavements: Plus or minus 1/2 inch.

3. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

P. SUBSURFACE DRAINAGE

1. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

    a. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.

2. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.-

1. Geotechnical Testing Agency: NU will typically engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
2. Testing agency will test compaction of soils in place according to ASTM D 1557, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
3. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 3500 sq. ft. or less of paved area or building slab, but in no case fewer than 2 tests.
4. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 250 feet or less of trench length, but no fewer than 1 test.
5. When testing agency reports that subgrades, fills, or backfills have not achieved degree

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