

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS .1 Geotechnical report included in Appendix D Report No. SM135013-G April 23, 2013 by Soil-Mat Engineers and Consultants Ltd.
- 1.2 REFERENCES .1 ASTM International  
.1 ASTM D 698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
- .2 CSA International  
.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .3 Ontario Provincial Standard Specifications (OPSS)  
.1 OPSS 1004-05, Material Specification for Aggregates-Miscellaneous.  
.2 OPSS SP 110F13-03, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water  
.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.  
.1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with EPA 832/R92-005.  
.2 Construction Waste Management:  
.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.  
.3 Showing, sheeting, bracing submit design for excavation bracing as required. Design shall bear the stamp of a Registered Professional Engineer in Ontario. Design shoring for loading in soils report.
-

- 1.4 MEASUREMENT PROCEDURES
- .1 Excavation - cubic metres.
  - .2 Backfill - cubic metres.
  - .3 Excavation shoring - square metres.
  - .4 Grading and restoration - square metres.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Granular B to OPSS SP 110F13. Sand to OPSS 1004.

PART 3 - EXECUTION

- 3.1 EXAMINATION
- .1 Verification of Conditions:
    - .1 Examine soil report included in Appendix.
    - .2 Before commencing work establish locations of buried services on and adjacent to site.
  - .2 Evaluation and Assessment:
    - .1 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.
    - .2 Testing of materials and compaction of backfill, and fill will be carried out by testing laboratory designated by Departmental Representative.
    - .3 Not later than 1 week before backfilling or filling, provide to designated testing agency, 23 kg sample of backfill fill materials proposed for use.
    - .4 Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.
    - .5 Before commencing work, conduct, with Departmental Representative, condition survey of existing structures, trees and plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.
-

- 3.2 PREPARATION
- .1 Temporary Erosion and Sedimentation Control:
    - .1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, in accordance with sediment and erosion control plan, specific to site, to EPA 832/R-92-005 and requirements of authorities having jurisdiction..
    - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
    - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
  
  - .2 Protection of in-place conditions:
    - .1 Protect excavations from freezing.
    - .2 Keep excavations clean, free of standing water, and loose soil.
    - .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.
    - .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
    - .5 Protect buried services that are to remain undisturbed.
  
  - .3 Removal:
    - .1 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.
    - .2 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
    - .3 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
    - .4 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.
    - .5 Remove stumps and tree roots below footings, slabs, and paving, and to 600 mm below finished grade elsewhere.
-

- 
- 3.3 EXCAVATION
- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial and Municipal regulations.
  - .2 Topsoil stripping:
    - .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
    - .2 Strip topsoil to depths as directed by Departmental Representative. Avoid mixing topsoil with subsoil.
    - .3 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
    - .4 Stockpile in locations as directed by Departmental Representative .
    - .5 Dispose of excess topsoil off site.
  - .3 Excavate as required to carry out work, in all materials met.
    - .1 Do not disturb soil or rock below bearing surfaces. Notify Departmental Representative when excavations are complete.
    - .2 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.
    - .3 Fill excavation taken below depths shown without written authorization with concrete of same strength as for footings.
    - .4 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
    - .5 Obtain Departmental Representative approval of completed excavation.
  - .4 Excavate trenches to provide uniform continuous bearing and support for 150 mm thickness of pipe bedding material on solid and undisturbed ground. Trench widths below point 150 mm above pipe not to exceed diameter of pipe plus 600 mm.
  - .5 Excavate for slabs and paving to subgrade levels.
    - .1 Remove topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.
- 3.4 SITE QUALITY CONTROL
- .1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.
-

3.5 BACKFILLING

- .1 Start backfilling only after inspection and receipt of written approval of fill material and spaces to be filled from Departmental Representative.
  - .2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
  - .3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
  - .4 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as specified for fill. Fill excavated areas with selected subgrade material compacted as specified for fill.
  - .5 Placing:
    - .1 Place backfill, fill and basecourse material in 150 mm lifts. Add water as required to achieve specified density.
    - .2 Place unshrinkable fill in areas as indicated. Consolidate and level unshrinkable fill with internal vibrators.
  - .6 Compaction: compact each layer of material to following densities for material to ASTM D 698:
    - .1 To underside of basecourses: 100%.
    - .2 Basecourses: 100%.
    - .3 Elsewhere: 90%.
  - .7 In trenches:
    - .1 Up to 300 mm above pipe or conduit: sand placed by hand.
    - .2 Over 300 mm above pipe or conduit: native material approved by Departmental Representative.
  - .8 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.
  - .9 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.
-

- 3.6 GRADING .1 Grade to ensure that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by Departmental Representative. Grade to be gradual between finished spot elevations as indicated.
- 3.7 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.  
.1 Dispose of cleared and grubbed material off site daily.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal comply with all MOE requirements for disposal of excavated material. See soils report.
- 3.8 RESTORATION .1 Upon completion of work, remove waste materials and debris in accordance to Section 01 74 20 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defect as directed by Departmental Representative.
- .2 Replace topsoil as directed by Departmental Representative.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by work as directed by Departmental Representative.
- .6 Protect newly graded areas from traffic and erosion and maintain free of trash and debris.