

**PART 1**      **GENERAL**

**1.1**            **RELATED SECTIONS**

- .1      Section 31 05 16 – Aggregates for Earthwork.
- .2      Section 31 23 33.01 – Excavating, Trenching and Backfilling
- .3      Section 33 42 13 – Pipe Culverts

**1.2**            **REFERENCES**

- .1      American Society for Testing and Materials International (ASTM)
  - .1      ASTM D 698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 600kN-m/m<sup>3</sup>.
- .2      Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
  - .1      OPSS-April 2003.

**1.3**            **SUBMITTALS**

- .1      Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .1      Submit to designated testing agency, 23 kg sample of backfill for fill material proposed for use, no later than one week before backfilling or filling work.
- .2      Quality Control: in accordance with Section 01 45 00 – Quality Control
  - .1      Submit testing, inspection results and report as described in PART 3 - FIELD QUALITY CONTROL.

**1.4**            **QUALITY ASSURANCE/REGULATORY REQUIRMENTS**

- .1      Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial Territorial and Municipal regulations whichever is more stringent.
- .2      Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

**1.5**            **WASTE MANAGEMENT AND DISPOSAL**

- .1      Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2      Divert unused vegetation materials from landfill to local facility as directed by Departmental Representative.

**PART 2**      **PRODUCTS**

**2.1**            **MATERIALS**

- .1      Granular A, B Type I, B Type II, M Select Sub grade to OPSS1010.
- .2      Crushed Granular 20-0, 20-0b, 56-0, Natural Gravel 80-0, Gravel and Sand, Stone Dust, Sand to CCDG14.02.

**PART 3**      **EXECUTION**

**3.1**            **TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1      Provide 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, according to sediment and erosion control drawings.
- .2      Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

**3.2**            **PREPARATION/PROTECTION**

- .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.

**3.3**            **CLEARING AND GRUBBING**

- .1      Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.
- .2      Dispose of cleared and grubbed material off site daily to disposal areas acceptable to authority having jurisdiction.

**3.4**            **EXCAVATION**

- .1      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.
  - .1      Stockpile topsoil on site for later use.
- .2      Excavate as required to carry out work.
  - .1      Do not disturb soil or rock below bearing surfaces.
  - .2      Notify Departmental Representative when excavations are complete.
  - .3      If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.
- .3      Excavate trenches to provide uniform continuous bearing and support for 150 mm thickness of pipe bedding material on solid and undisturbed ground.
  - .1      Trench widths below point 150 mm above pipe not to exceed diameter of pipe plus 600 mm.

**3.5**            **BACKFILLING**

- .1      Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by 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 sub grade: compact existing sub grade under slabs on grade to same compaction as specified for fill.
  - .1 Fill excavated areas with selected sub grade material compacted as specified for fill.
- .5 Placing:
  - .1 Place backfill, fill and base course material in 150 mm lifts: add water as required to achieve specified density.
- .6 Compaction: compact each layer of material to following densities for material to ASTM D 698:
  - .1 To underside of base courses: 95%.
  - .2 Base courses: 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 areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.
- .9 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.

### **3.6 GRADING**

- .1 Grade so that water will drain.

### **3.7 FIELD QUALITY CONTROL**

- .1 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory engaged by the Contractor. All costs for testing will be borne by the Contractor.
- .2 Not later than one week before backfilling or filling, provide to designated testing agency, samples of backfill as described in PART 1 - SUBMITTALS.
- .3 Do not begin backfilling or filling operations until material has been approved for use by Departmental Representative.
- .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.

### **3.8 SHORTAGE AND SURPLUS**

- .1 Supply necessary fill to meet backfilling and grading requirements and with minimum and maximum rough grade variance.
- .2 Dispose of surplus material off site.

**3.9 CLEANING**

- .1 Proceed in accordance with Section 01 74 00 – Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**